2022

Region IX

STANDARD OPERATING PROCEDURES/ STANDING MEDICAL ORDERS

2022

NORTHWEST COMMUNITY EMS SYSTEM MARKUP EDITION

Healthcare delivery requires structure (people, equipment, education) and process (policies, protocols, procedures) that, when integrated, produce a system (programs, organizations, cultures) that leads to optimal outcomes (patient survival and safety, quality, satisfaction). An effective system of care comprises all of these elements -structure, process, system, and patient outcomes -in a framework of continuous quality improvement (AHA, 2020).

These protocols have been developed and approved through a collaborative process involving the Advocate Lutheran General; Greater Elgin Area, McHenry Western Lake County, Northwest Community, Saint Joseph, and Southern Fox Valley EMS Systems to reduce variation in practice and establish a Region-wide System of care.

Intended use:

- Written practice guidelines/pathways of care approved by the EMS Medical Directors (EMS MDs) to be initiated by System EMS personnel for off-line medical control.
- Standing medical orders to be used by Emergency Communications Registered Nurses (ECRNs) when providing online medical control (OLMC).
- Medium to large scale multiple patient incidents, given that usual and customary forms of communication are contraindicated as specified in the Region IX disaster plan.

System members are authorized to implement these orders to their scope of practice. OLMC communication shall be established without endangering the patient.

Under no circumstances shall emergency EMS care be delayed while attempting to establish contact with a hospital.

In the event that communications cannot be established, EMS personnel shall continue to provide care to the degree authorized by their license, these protocols, drugs/equipment available, and their scope of practice granted by the EMS MD.

Patient care is by nature unpredictable. Online ED physicians have the latitude to deviate from these guidelines if it is believed that deviation is in the best interest of the patient. Such deviations should not detract from the high level of patient care expected from EMS personnel or cause foreseeable risk to a patient, bystanders or EMS personnel.

If a patient situation is not covered by these standing orders, initiate Initial Medical or Initial Trauma Care and contact the nearest hospital with System OLMC privileges as soon as possible for a physician's instructions.

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NWC EMSS 2022 SOPs MARK-UP COPY
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Introduction

Assumptions

1. All EMS personnel will function within their **scope of practice** as defined by the National EMS Scope of Practice Model; IDPH, and practice privileges awarded by their local EMS MD.
2. These SOPs are **evidence-based** and are revised as standards of practice or clinical practice guidelines change. They include, but are not limited to, guidelines from the Ntl Assoc. of EMS Physicians, Am Heart Assoc., Am Coll of Surgeons, Am Coll of Em Physicians, Brain Trauma Foundation, Centers for Disease Control and Prevention, EMS for Children; the Ntl EMS Education Standards, Ntl EMS Scope of Practice Model and EMS Core Content.
3. ***Italicized options*** may not be used in all Systems. Refer to 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 the Model of Clinical Practice of Emergency Medicine; in the Ntl EMS Core Content: Acuity level is essential for identifying care priorities in an EMS setting. They are coded to NEMSIS standards and should be documented as such in the ePCR. **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 a more serious disease or development of complications.
5. **Stable:** Maintains a steady-state of equilibrium with VS that support adequate oxygenation, ventilation, perfusion, & mentation

General guidelines

1. **Abandonment:** EMS personnel shall not knowingly abandon a patient. Abandonment is the unilateral termination of a health practitioner-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 EMS 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. **Consent:** Permission to render care. A pt with legal and decisional capacity (see Behavioral Emerg SOP for assessment) or a legal decision-maker must consent for treatment unless an emergency justifies Rx without consent. Consent must be expressed (written or verbally) or clearly implied via gestures indicating a desire for treatment. A pt's lack of refusal or physical resistance will be taken as consent.
3. **Implied Consent (emergency doctrine):** Consent is automatically assumed if a patient is unresponsive, is in danger of losing life or limb, and is unable to make a rational informed decision (lacks capacity).

   Involuntary consent: Applies to patients who are mentally ill, lacking capacity and experiencing a behavioral emergency/ crisis and/or persons in law enforcement custody experiencing a true emergency.
4. **Minors:** Patients <18 should generally have the consent of a parent or legal decision-maker obtained prior to treatment unless they qualify as a mature minor (may consent under specific circumstances), or are an emancipated minor. See System policies regarding parent/guardian consent and notifications.
5. **Refusals/dissent to care:** Patients who have legal and/or decisional capacity and pose no imminent risk to self or others have the legal right to refuse treatment, even if refusal will result in death from natural causes. Patients who lack capacity or pose an imminent risk to self (suicide), others, or are unable to care for themselves (self-neglect) may not consent to nor refuse treatment. (See System-specific policies)

   "Self-neglect": Means a condition that is the result of an eligible adult's inability, due to physical or mental impairments, or both, or a diminished capacity, to perform essential self-care tasks that substantially threaten his or her own health, including: providing essential food, clothing, shelter, and health care; and obtaining goods and services necessary to maintain physical health, mental health, emotional well-being, and general safety. The term includes compulsive hoarding, which is characterized by the acquisition and retention of large quantities of items and materials that produce an extensively cluttered living space, which significantly impairs the performance of essential self-care tasks or otherwise substantially threatens life or safety. (320 ILCS 20/) Adult Protective Services Act.

   "Emergency" under the above Act means a situation in which an eligible adult is living in conditions presenting a risk of death or physical, mental or sexual injury and the provider agency has reason to believe the eligible adult is unable to consent to services which would alleviate that risk.
6. **Red Lights and Sirens (RLS):** Routine use of RLS is not warranted. 625 Illinois Compiled Statutes (ILCS) SECTION 11-1421. No person shall operate an ambulance or rescue vehicle in a manner not conforming to the motor vehicle laws and regulations of this State or of any political subdivision of this State… unless in compliance with the following conditions: The person shall be either responding to a bona fide emergency call or specifically directed by a licensed physician to disregard traffic laws in operating the ambulance during and for the purpose of the specific trip or journey. The EMS MDs authorize the transport of time-sensitive patients (black box notations) using RLS and in accordance with System policy.
7. **Alternative destination transports**: EMS personnel may provide alternative pathways of care that include transport to a licensed healthcare facility such as a licensed mental/behavioral health care facility, licensed drug treatment center, or licensed emergency care center. See local System policies.

EMS Scopes of Practice

National Scope of Practice Model (2021) as adopted by IDPH and the NWC EMSS

See local policies/ procedures for details	EMR	EMT [BLS]	PM/PHRN/ PHAPRN and PHPA [BLS + ALS]
Monitoring	• Blood pressure (manual) • Apply an appropriate pulse oximetry (SpO_2) sensor • Blood glucose	• Blood pressure (automated) • Capnography monitoring • Interpret SpO_2 findings	• Blood chemistry analysis (point of care testing
Airway/ventilatory management **Oxygen delivery**	• BLS manual airway maneuvers, OPA/NPA • Mouth to barrier /mask vent. • Airway obstruction – manual dislodgement techniques • O_2: NC, NRM, BVM • Suctioning: upper airway	• Suctioning: Tracheal via ETT • O_2: simple face mask, BiPAP, CPAP, PEEP • Occlusive dressing applied to a penetrating chest wound	• Magill forceps for airway FB removal • Suctioning: Trach and stoma • Trach tube replacement through stoma • Intubation: Adult (bougie) • Extraglottic airways • Needle/surgical cricothyrotomy • Use of transport ventilators • Needle pleural decompression
Circulatory/cardiac management **Vascular access**	• Quality CPR • Defibrillation: automated, semi-automated • Hemorrhage control: direct pressure; wound packing (hemostatic gauze/agents), tourniquet	• ECG limb lead application • 12 L ECG acquisition & transmission to OLMC • Mechanical CPR device • Spiking IV bag; priming tubing for vascular access	• ECG rhythm & 12 L interpretation • Defibrillation (manual); synchronized cardioversion • Transcutaneous pacing • Venous blood sampling • Vascular access: peripheral veins, IO (adult & peds) • Sapphire IV pump • Accessing central venous devices already placed based on OLMC
Psychomotor skills	• Manual spine motion restr • C-collar; spine board • Extremity stabilization (manual)/splinting • Emerg. moves for endangered pts. • Assisted OB delivery • Eye irrigation (manual)	• Monitoring of OG/NG tube already inserted • Splinting: traction • Bandaging; BLS burn care • Assisted complicated OB delivery • Mechanical restraints	• Eye irrigation w/ tetracaine • Assess JVD & pulsations • ALS burn care • Protective equipment removal • Monitoring indwelling urinary catheter already placed
Pharmacology Medication administration	**Preparation and administration of drugs by routes listed for all ages** • ASA for chest pain PO • Oral glucose • Epinephrine: Assisted administration of pt's autoinjector • Epinephrine autoinjector • Naloxone IN; autoinjector IM	• Acetaminophen PO • Albuterol nebulized • Calcium gluconate gel • Diphenhydramine PO • Ipratropium bromide nebulized • Epinephrine (1mg/1mL) IM from ampule or vial • Glucagon IN or IM • Mark I/DuoDote autoinjector • Naloxone IN & IM • NTG (chest pain w/ suspected ischemia • Ondansetron ODT • Immunizations during a public health emergency	PO, IN, IM, SUBQ, IVP, IVPB, IO, SL, topical, IR depending on drug • Adenosine; amiodarone • Atropine sulfate • Benzodiazepines • Cyanide antidotes • Dextrose 10% (25%, 50%) IVPB; Diphenhydramine • Epinephrine all concentrations • Etomidate/ketamine • Fentanyl, acetaminophen IV, morphine (alt only) • Lidocaine 2% • Magnesium sulfate • Naloxone; norepinephrine, NTG • Ondansetron • Sodium bicarbonate • *Steroids (by waiver)* • Tetracaine ophthalmic solution • Verapamil

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.

1. **SCENE SIZE UP: Situational awareness; dynamic risk assessment –Assess/intervene as needed:**
   - Scene safety; control and correct hazards; remove patient/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 a 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 for hypoxia or hypercarbic ventilatory failure
     - 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 now if in ventilatory distress
     - **SpO_2** if possible hypoxia, CR or neurological compromise. Note before & after O_2 if able.
       S&S hypoxemia: Dyspnea, irritability; confusion, somnolence: tachycardia, arrhythmia; tachypnea; cyanosis (late)
     - **$EtCO_2$** number & waveform if possible ventilatory/perfusion/metabolic compromise
       S&S hypercarbia: Headache; change of behavior; AMS/coma; warm extremities

     __Correct hypoxia/assure adequate ventilations__: Target SpO_2: 94%-98% (88%-92% COPD) unless hyperoxia contraindicated
     - **O_2 1-6 L/NC**: Adequate rate/depth; minimal distress; SpO_2 92%-93% (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:** Noninvasive positive pressure ventilation (NIPPV) for cardiopulmonary complaints related to primary respiratory, ventilatory, or cardiovascular dysfunction (See appendix for indications; absolute and relative contraindications). Must be able to breathe spontaneously throughout the complete ventilatory cycle.

     ***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 high quality CPR.
     - **Perfusion**: Mental status (central); skin: color, temperature, moisture; turgor (peripheral)
     - Identify type, amount, & source(s) of fluid loss; **control external hemorrhage** (See ITC)
     - **ECG:** (rhythm/12 L) based on CC or PMH: pain/discomfort nose to navel (including abd. pain), respiratory distress/dyspnea; HF, AMS - weak/tired/ fatigued, dizziness/syncope, c/o nausea, indigestion, palpitations/ dysrhythmia, diaphoresis, etc. (Impression ACS, dysrhythmia, pericarditis, myocarditis, PE, COPD, stroke)
       ALS patients with normal ECG and no S&S suggesting above **do not** require ongoing ECG monitoring or transmission of a strip to OLMC. If ECG is run, append to PCR for review by 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 urgently needing fluids and/or medications (circulatory collapse; difficult, delayed, or impossible venous access; or conditions preventing venous access at other sites).
    If responsive: Adult: Lidocaine 2% 1 mg/kg (max 50 mg) slow 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 type and 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) | 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, effort | Temp if indicated
   - **Chief complaint (CC); history of present illness (HPI); 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
     - **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 CC; S&S; practitioner scope of practice, and patient 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) for guarding, rigidity, 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; 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 specified
   AMS: Place on side (recovery position) or elevate head 10°-30°, unless contraindicated, to minimize aspiration
5. **NAUSEA/VOMITING: ONDANSETRON 4 mg** oral dissolve tablet [BLS] or slow IVP (over 30 sec) [ALS]
   May repeat once in 10 min to total of 8 mg
6. **Pain:** Treat per PAIN management SOP
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/CR intervention; last set should be taken shortly before arrival at receiving facility
   Unstable: More frequent reassessments; continue to reassess all abnormal VS, monitored, & physical findings
8. **Patient disposition:** Transport to the nearest approved licensed facility by travel time unless preexisting transport patterns exist (trauma, STEMI, stroke, OB, peds) or an exemption applies. Stable pts may be transported to an Alternative Destination (see introduction) or more distant requested facility, or may not be transported per local policy that may or may not require prior OLMC authorization and/or telecommunication w/ approved PCP.

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.

PAIN MANAGEMENT

Person-centered approach: Use an age and cognitively appropriate a pain assessment tool (see last pg. SOP).
Consider patient factors: genetics, culture, age, previous pain experiences, comorbidities; responder scope of practice, and risks/benefits of each strategy. Establish realistic pain goals. Provide individualized pain mgt. tailored to patient needs regardless of transport interval.

- Consider if pain is due to acute, chronic, or acute on chronic exacerbation causes
- Assess pain medication history: OTC, Rx, and herbal
- Is pt opioid-naïve, tolerant, or dependent? Is the patient known to be misusing opioids?
- **Carefully estimate pt size/weight |** See Appendix

Goal: Pain is reduced by at least 2 points (numeric pain scale) and/or to tolerable levels (may not reach 0) unless pain interventions are contraindicated, the patient has AMS (GCS <15 or mentation <baseline), is hypotensive for age/ condition, or refuses the intervention.

VERIFY DOSING: See 7 Rights of Medication Administration | **Cross-Check Procedure** (Appendix)

OPTIONS: Pharmacologic and non-pharmacologic - See drug appendix for full profiles/dose charts

- ☐ **BLS:** Splinting, distraction, imagery, cold packs, Buzzy (if available)
- ☐ **BLS: Mild-moderate pain - ACETAMINOPHEN** chewable tabs **PO**
- ☐ **ALS: Severe pain - ACETAMINOPHEN IV**
- ☐ **ALS: NITROUS OXIDE** if available

If severe pain (7-10): Opioid naive

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 dose/SOP 50 mcg)
Additional doses require OLMC: 0.5 mcg/kg q. 5 min up to a max total dose of 3 mcg/kg (300 mcg) if indicated

Severe pain: Opioid tolerant or dependent | allergy to fentanyl | option for mild sedation + pain relief

KETAMINE: 0.3 mg/kg (max initial dose 50 mg) slow IVP (over 1 min), IN / IM.

May repeat X 1 in 20 min (max total dose 100 mg)

Assess and document response to interventions: Assess pain, VS, ECG, SpO_2 and $EtCO_2$, GCS, before (if able) and within 5 min after each dose. **If no improvement,** adjust regimen or consider need for repeat dosing.

EMERGENCY DRUG ALERNATIVES: See Appendix

Purpose: To provide alternatives when the primary medications are unavailable

Alternative for pain – MORPHINE

Alternative to MIDAZOLAM for sedation/seizure management: **DIAZEPAM** if available
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)

Options for INOPRESSORS – See Drug Appendix for full profiles and dose charts

NOREPINEPHRINE drip IV (lg. vein)/IO: Mix 4 mg in 1,000 mL NS (4 mcg/mL) | Intentional for easy EMS dosing
Adult Initial dose: 8 mcg/min (2 mL/min) titrated to reach SBP ≥ 90 (MAP ≥ 65)
Peds Initial dose: 0.1 mcg/kg/min (max 1 mcg/kg/min up to 8 mcg/min) titrated to SBP >70 + (2 X age in yrs)
Higher doses (10 mcg/min) RARELY needed – contact OLMC. Assess BP (MAP) q. 2 min until target BP is reached (don't overshoot) | Then reduce dose (drip rate) incrementally just to maintain at BP targets.
Maintenance: Adult: 2 to 4 mcg/min (0.5 mL to 1 mL/min) or less | Continue to reassess BP q. 5 min.

PUSH DOSE EPINEPHRINE: **OLMC only**: **Adults:** Waste 9 mL of Epi 1 mg/10 mL (cardiac preload); draw up 9 mL NS (now have 10 mcg/mL or 0.01 mg/mL) Label syringe. Give 0.5 to 1 mL (5-10 mcg) IVP/IO q. 2-5 min to desired MAP; reassess after each bolus dose. Additional doses: OLMC.

Peds: Draw up standard cardiac **Epi 1 mg/10 mL 0.01 mg/kg dose** (see chart in Appendix) into a 10 mL syringe | dilute with NS to total 10 mL of fluid in syringe. Each 1 mL has 1 mcg/kg or 0.01 mg/kg epi for that patient.
Label syringe. Give 0.5 to 1 mL IVP/IO q. 2-5 min to desired MAP; reassess after each bolus dose.

On-line Medical Control (OLMC)/handoff 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 establishing OLMC unless pt care and/or hospital destination is in question
- Notify OLMC ASAP regarding **critical (time sensitive) patients**
- Call prior to availability of specific information if hospital requires advance notice | 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; orientation; and decisional capacity (if indicated)
4. **Chief complaint, nature of call, and EMS impression** including perceived acuity/severity
   Indicate if calling an ALERT (Trauma, STEMI, Stroke, Sepsis)
   - 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 or injury(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 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 (SpO_2) on room air (RA) and O_2 if indicated
   - Capnography ($EtCO_2$) numeric reading and waveform configuration if indicated and available
   - ECG interpretation: Rhythm, 12 L if indicated
   - Blood glucose (bG) level; if indicated
   - Glasgow Coma Scale/mental status parameters if AMS
7. **Treatments initiated** (or refused by pt) prior to hospital contact and patient response to treatment
8. **Disposition/Destination facility | ETA** | Call back number | Update as necessary
9. Call update report directly to receiving facility if different from OLMC if changes occur prior to arrival & if time permits.
10. **Handoff report**: After arrival, a face-to-face uninterrupted verbal **report** communicated with mutual respect between healthcare team members is critical to patient safety, reducing risk, and integrating EMS with the healthcare system during transfer of care. Safe practice also requires that key information is provided in a writen or electronic report to the receiving facility at the time of handoff in compliance with IDPH rules and local policy.

ABBREVIATED OLMC REPORT

Indications: Multiple patient incidents; BLS pts with normal assessment findings; CRITICAL pts where priorities rest with patient care and if the # of EMS responders is limited prohibiting a detailed OLMC report.

Report format:

1. Hospital contacted, EMS agency, receiving facility, ETA; pt. age, gender, mental status and decisional capacity
2. Nature of illness/injury/situation and how it meets the criteria for an abbreviated report
3. CC and brief HPI | Initial impression including perceived acuity/severity; apparent life-threats; degree of distress
4. VS; oximetry & ECG (if applicable) and interventions/resuscitation provided

Withholding or Withdrawing EMS Care/Resuscitation

1. Patients may be pronounced dead in the field per System policy. Any declaration of death **MUST be approved by a physician (OLMC, coroner, medical examiner) |** Contact OLMC
   Document date and time of pronouncement and the physician's name in the PCR/EHR.
2. Determine patient disposition according to local requirements.
3. Document all circumstances re: use of this protocol. Append copies of documents (POLST) to ePCR if possible.
4 If orders are disputed | authority of POA/surrogate is uncertain | indicated care is questionable:
   Contact OLMC; explain situation; follow orders received or seek an override with Resource Hospital OLMC

EMS personnel may withhold or withdraw EMS care | Resuscitation in the following circumstances:

- Patient meets **Triple Zero criteria**, local non-initiation of resuscitation protocols, or is declared to be **deceased**
  For Termination of Resuscitation (TOR) guidelines, see Cardiac Arrest SOP
- **POLST/DNR order** (appropriately executed) is presented to EMS personnel
- **Court Order** (Child < 18 years): is provided to EMS indicating that CPR is not to be commenced
- EMS-patient relationship is terminated by mutual consent in compliance with standards
- A **patient/surrogate** with legal and decisional capacity **dissents to care** and/or transportation
  Exceptions: Pt poses an imminent risk to self (suicide/self-injurious behaviors), others, or meets self-neglect emergency criteria and/or remains acutely & severely hemodynamically unstable/ in physiologic distress with AMS after care
- Treatment needs exceed the scope of practice or equipment available to EMS
- **Resources are inadequate** to treat all patients (multiple patient incidents)
- The patient acts inappropriately in a manner that poses a **risk to the health and safety of EMS personnel**

ADVANCE DIRECTIVES

POLST process	"**P**ractitioner **O**rders for **L**ife-**S**ustaining **T**reatment" (IL PA 102-0140). Recognize any form formally authorized by any state or territory within the US (MOST, POST, MOLST, and POLST.

1. A valid POLST form does not expire; earlier forms are still recognized; a new form voids past ones; follow most recent form | Original form is NOT necessary – copies of a valid form are acceptable
2. Follow current POLST Illinois guidelines: If form is missing or improperly executed, contact OLMC.
   Honor a POLST form with or without a witness signature | A patient may revoke consent at any time.
3. If resuscitation begun prior to form presentation, follow form instructions after order validity is confirmed.

Power of Attorney for Healthcare (POA) | Legally appointed healthcare surrogate | Living Wills

1. **Living wills** may not be honored by EMS
2. If **POA/healthcare surrogate** document presented: confirm terms (implementation date/powers awarded).
   Agent may consent or dissent to medical treatment for the pt. (Healthcare Surrogate Act (755 ILCS 40/)
3. If POA/Surrogate wishes to rescind a POLST/DNR order consented to by the patient:
   - Converse with surrogate; consult/discuss the pt-completed advance directive; document discussion
   - #1: Use **Substituted judgment standard:** What would pt chose if known?
   - #2: **Best interest standard:** What would bring most benefit to pt by weighing risks & benefits of Rx options?

   A POA/Surrogate may rescind a DNR order for which they or another surrogate provided consent

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
- Decomposition
- Mummification
- Incineration
- Trauma where CPR is impossible
- Profound dependent lividity
- Putrefaction
- Frozen state

DO NOT start CPR; contact OLMC; explain situation; indicate that you have a "triple zero"; follow orders received

Hospice patients not in cardiac/respiratory arrest

- Follow patient/surrogate wishes | Consult with hospice representatives on scene re: other care options
- Contact OLMC; communicate pt's status; POLST selection; hospice recommendations; presence of written treatment plans and/or valid DNR orders | Consider CPAP to ease ventilatory distress
- If hospice enrollment confirmed but no POLST form 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.

ELDERLY PATIENTS (65 and older)

- Aging reflects loss of function and reserve capacity over time | Physiological aging rates vary; evaluate individually
- Pts. fear loss of autonomy and may not admit to impairments | Promote independent decision-making within capacity
- **Frail elderly** may have impairments with mobility, nutrition, and/or cognition | **Evaluate for possible abuse/neglect**
- Physiologic responses may differ due to changes assoc. w/ aging + comorbidities
- **Can experience significant trauma despite a relatively minor MOI**
- Post-injury complications negatively impact survival; take mitigating steps prn

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
   - Prone to dry mouth, aspiration, respiratory muscle fatigue, hypoxia, ventilatory failure, ↑ WOB
     Consider need for CPAP | Advanced airway | Ventilation/BVM if O_2 via NC or NRM is ineffective
     Anticipate difficult airway access if loose dentures/missing teeth, cervical arthritis, kyphosis
   - **Blunt thoracic trauma**: Risk for rib fx | Titrate pain mgt to ventilations, oximetry, & BP (MAP)
   - **If chronic hypercarbic state** (COPD): Rx **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, so normal BP may reflect hypotension**. Concern: HR >90; SBP <110 in trauma pts.
   Anticipate ACS/silent MIs, SE of meds/SUD; hypovolemia/dehydration**;** pneumonia; UTI/acute renal failure; stroke, syncope; GI problems, occult bleeding, glucose emerg; and sepsis/septic shock
   ID cause of hypoperfusion/shock/acidosis | Monitor for low cardiac output | Support perfusion/correct hypotension
   IV NS up to 1 L: Assess mental status, SpO_2, $EtCO_2$, bG, lung sounds, skin, VS; 12-L ECG [if ind. & available]
4. **Changes in mentation:** Dementia or delirium may lead to late recognition of hypoxia, hypercarbia, hypoglycemia, hypothermia, shock, stroke, or TBI. Neuro exam can be unreliable for detecting S&S of intracranial hemorrhage. Assess pt's baseline and time of onset of acute alterations from their normal.
4. **PMH - Medications/compliance**: Polypharmacy poses special risks (see drug lists HF SOP)
   - Beta blockers, ACEI, ARBs, Ca blockers, & digoxin may limit ability to ↑HR to compensate for hypotension
   - Anticoagulants can increase risk for systemic or intracranial hemorrhage; notify OLMC ASAP
   - Benzodiazepine, alcohol & opioid prescription abuse common; monitor mental/ventilatory status carefully
5. **Altered sensory perception:** Accommodate for hearing, visual, cognition, memory, perception, communication, and motor deficits. Allow to use glasses/hearing aids | Speak slowly, distinctly & loudly enough to be heard in a low-pitched tone | Provide adequate lighting. | **KEEP WARM!** Prevent/correct hypothermia | Reduce environmental stimuli
6. **At risk for SCI:** Underlying spine/bone conditions/bone density losses predispose to injury after minor MOI
   Carefully assess for spine trauma and cord syndromes | **Provide SMR after all falls** and per SCI SOP
   Handle gently: NO log roll | Use sheets or scoop stretcher to lift and move
   If placed on spine board: Pad well, protect bony prominences | **Inform ED re elderly pt on a board**
7. **PAIN**: Reduce drug doses | May be more susceptible to adverse effects (resp. depression & CV effects)
   May have age-related kidney or liver impairment resulting in lower drug clearance rates
8. **All refusals** of care in elderly require OLMC contact from scene prior to releasing pt per System policy.

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 ↑ 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; impaired metabolism and excretion of meds
Neural	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 most common; Central cord syndrome more frequent due to hyperextension; nerve damage – peripheral neuropathy.

EXTREMELY OBESE PATIENTS

Excess wt becomes a health hazard at ≥20% above desirable wt | **Obesity:** Body mass index (BMI) ≥ 30 kg/m^2
Increases risk for type 2 DM (T2D), cancer, heart disease, HTN, high cholesterol, gallstones, sleep disordered breathing, venous thrombosis, A-fib, reflux, kidney disease, disability, and death. Eating disorders and psychological stigma are linked to obesity. **Leading causes of death in adults with obesity:** ischemic heart disease, stroke (ischemic), T2D, respiratory diseases, and cancer (e.g., liver, kidney, breast, endometrial, prostate, and colon).

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

   Positioning: Consider risk for apnea, airway obstruction, ventilatory distress, and desaturation when flat. Elevate upper torso or sit up as tolerated to optimally open airway and facilitate ventilations

   Secure airway - Advanced airway considerations: Higher incidence of tube dislodgement; $EtCO_2$ required

   - Anticipate difficult airway access | Airway size selection does not change due to obesity
   - Due to the wt of the chest and larger abdomen, supine position can complicate pre-oxygenation and cause hypotension | Use ramped position | Attempt to pass ETT X 1 per procedure
   - If ETI unsuccessful or not advised: Insert alternate airway (BIAD)

   Breathing: Assessment of lung sounds may be difficult; listen over back first; midaxillary sites

   - **SpO_2 monitoring**: Can desaturate quickly when flat and be more difficult to monitor Consider use of central sensor to better detect oxygenation
   - **$EtCO_2$** if available; CO_2 retention probable (46-52 mEq/L) (obesity hypoventilation syndrome)
   - **O_2** by NRM or **CPAP** (PEEP 5 – 10 cm H_2O); assist w/ BVM (2 person technique) if severe hypoxia or hypercarbia

   Circulation:

   - Fluid loading is poorly tolerated
   - Standard peripheral IV approaches may be difficult d/t thickness of SUBQ fat
   - **IO:** 45 mm 15 g needle; sites per System procedure
   - **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 | commercials c-collars may not fit

   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 wt 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**: Consider stretcher/spine board wt. limits. Request 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 diaphragm position	↑ LV volume, which can lead to dilation and hypertrophy
↓ Diameter of trachea	Atherosclerosis
↓ Functional reserve capacity	↓ 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**
↑ intra-abdominal pressure	Limited mouth opening capacity; short neck with limited mobility
↑ volume of gastric fluid	↓ ROM; pro-inflammatory state, osteoarthritis, chronic pain
↑ incidence of GERD / hiatal hernia	

ADULT FOREIGN BODY 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 extremely 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 FB expelled or patient becomes unconscious

UNCONSCIOUS

Note: When 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 (or suction) 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 FB into right mainstem bronchus, pull ETT back and ventilate left lung
6. **If still obstructed and unable to intubate or ventilate adequately: Consider cricothyrotomy**
   - Per SOP: ≥13 yrs: Needle or surgical | ≤12 yrs: Needle
   - Per OLMC only: 8-12 yrs: Surgical
   - Transport; attempt to ventilate with 15 L O_2/BVM

ADVANCED AIRWAYS | DRUG-ASSISTED INTUBATION (DAI)

Purpose DAI: Achieve rapid ETI in patients with intact airway reflexes via use of medications that facilitate intubation

Consider indications for ADV airway placement:

- Actual or potential airway impairment or aspiration risk that cannot be mitigated by other interventions
- 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 due to an acute condition unlikely to be self-limited
  Self-limiting conditions: seizures, hypoglycemia, postictal state, select drug OD (GHB, ecstasy) or TBI
- Unable to ventilate/oxygenate effectively with BLS airways and BVM
- Need for ↑ inspiratory pressure or PEEP to maintain gas exchange & CPAP contraindicated
- 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 & $EtCO_2$ before and after airway intervention | Confirm patent IV / IO; ECG monitor
   Consider & Rx causes of impairment | Suction, manual maneuvers | **BLS airways:** + Gag: NPA | No gag: OPA
2. **Prepare pt: Position** for optimal view and access (head up to 45° unless contraindicated) | Assess for difficult intubation
3. **PREOXYGENATE 3 minutes** (O_2 wash in; nitrogen wash out)
   Apply $ETCO_2$ NC 15 L; maintain before and during procedure – If 2 O_2 sources add:
   RR ≥10 / AWAKE / good ventilatory effort: Consider CPAP at 5-10 PEEP if not contraindicated
   RR <10 or shallow: O_2 15 L/BVM at 10 BPM to $SpO_2 \geq 94\%$
   If Hx asthma/COPD: 6-8 BPM to SpO_2 92%. If SpO_2 does not meet targets, contact OLMC
4. **Prepare equipment**: BSI, **suction** (attach rigid tip catheter); drugs & airway equipment (per procedure)
5. **Premedicate** while preoxygenating: If pain mgt needed and etomidate used to sedate: **FENTANYL** standard dose
6. **SEDATION in order of preference:** Allow for clinical response before intubating if possible | Estimate wt carefully
   - **KETAMINE 2 mg/kg** slow **IVP** (over one min) or **4 mg/kg IN (NAS) / IM (max 300 mg) OR**
   - **ETOMIDATE 0.5 mg/kg IVP** (max 40 mg) if ketamine contraindicated
7. **Intubate** per procedure: Bougie required | Blade insertion = 1 attempt | Limit 2 attempts (1 attempt to pass ETT)
   - Monitor VS, mental status, skin color, $EtCO_2$, SpO_2 q. 5 min. during procedure
   - Assist ventilations at 10 BPM if RR or depth inadequate, ↓ BP, or hypoxic
8. **Confirm tube placement**
   - Ventilate: Rate & pressure just to see visible chest rise | 5 point auscultation: stomach, midaxillary; anterior chest
   - **Monitor $EtCO_2$**: No trace: Wrong place! | If uncertain: Confirm tracheal position with laryngoscopy
9. **If ETI successful**
   - Continue monitoring adequacy of oxygenation, ventilations, & tracheal placement:
     O_2 to SpO_2 94% (92% COPD) | $EtCO_2$ (35-45) | Ventilate prn at 10 BPM (asthma 6-8)
   - Inflate ETT cuff (avoid overinflation) | Note diamond # on ETT at teeth or gums (3 X ID ETT)
   - Secure airway with commercial device | Apply lateral head immobilization
   - **After 10 min:** Assess need for **postinvasive airway sedation and analgesia** (PIASA) **– See RASS** (below)
     If SBP ≥ 90 (MAP ≥ 65) (in order of preference)**:**
     KETAMINE (pain dose**)** 0.3 mg/kg slow IVP (pain relief + sedation) unless contraindicated
     OLMC NOT needed for ketamine pain dose added to sedation dose that exceeds max total of 300 mg |.. OR
     MIDAZOLAM standard sedation dose + **FENTANYL** (standard dose) if restless/tachycardic (S&S pain)
10. **If ETI unsuccessful**: Reoxygenate X 30 sec; repeat steps 7 & 8. Consider need for additional medication.
    If 1st or 2nd ETI attempt unsuccessful or not advised: Consider **alternate airway (BIAD)**; ventilate & monitor as above
11. **Cannot place ADV airway or ventilate**: Needle or surgical **cricothyrotomy** per System procedure

The **Richmond Agitation Sedation Scale (RASS)**

Assesses level of alertness or agitation | Used after placement of ADV airway to avoid over/under-sedation

Combative	+4	Agitated	+2	Alert and calm	0	Light sedation	-2	Deep sedation	-4
Very agitated	+3	Restless	+1	Drowsy	-1	Moderate sedation	-3	Unarousable sedation	-5

Goal: RASS -2 to -3. If higher (not sedated enough) assess for pain, anxiety | Rx appropriately to achieve RASS of -2

ALLERGIC Reactions | ANAPHYLACTIC Shock

Allergic reactions have different mechanisms, triggers, clinical presentations, and vary widely in severity | Treat rapidly

1. **IMC** special considerations: If ABCs compromised, go immediately to Rx
   - Repeat assessments for airway patency/edema; wheezing, respiratory effort | Adequacy of perfusion
   - Obtain PMH | Determine if Epi already given | Ask about **Anaphylaxis Emergency Action Plan**
   - Apply venous constricting band proximal to bite or injection site if swelling is ↑ rapidly
   - Attempt to identify/remove inciting cause | Apply cold pack to bite/injection site unless contraindicated
   - Do NOT start IV, give meds, or take BP in same extremity as a bite or injection site

LOCAL Reaction: Isolated hives and edema at the site of exposure or GI distress after food ingestion — SBP ≥ 90 (MAP ≥ 65)

2. Observe for progression and transport

Lower acuity: Mild SYSTEMIC Reaction ABCs stable/no airway compromise; — SBP ≥ 90 (MAP ≥ 65)
S&S: Nasal congestion, sneezing, periorbital swelling, rash, itching, tearing; lungs clear

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

Likely allergen or trigger + **S&S in 2 or more Systems - occurring rapidly after exposure**

- **Skin/mucosal tissues**: Itching, flushing, generalized hives, swelling/edema
  Mouth/throat: drooling, edema of the airways (lips, tongue, uvula, larynx, soft tissues); tongue/throat itching
- **Respiratory**: **Dyspnea**, cough, bronchospasm/ **wheeze**, stridor, hoarseness; chest tightness; hypoxia
- **GI** edema: dysphagia, abdominal cramping/pain, diarrhea, nausea/vomiting

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

2. **EPINEPHRINE** (1 mg/1 mL) **0.3 mg** (mL) **IM** (anterolateral thigh) [BLS]
   - Caution: HR > 100, CVD/HTN; on beta blockers, digoxin, MAO inhibitors; or pregnant
   - May repeat in 5 minutes prn; **DO NOT DELAY TRANSPORT waiting for a response**

   Consider need for CPAP
3. If wheezing: **ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg** via HHN/mask. Add O_2 6 L/NC if SpO_2 < 94 [BLS]
4. **DIPHENHYDRAMINE 50 mg IVP**; if no IV give **IM** [ALS] | PO if no airway compromise or vomiting [BLS]

CRITICAL: Severe SYSTEMIC Reaction/ANAPHYLACTIC SHOCK : Above +

Time sensitive pt

Severely impaired airway/severe dyspnea; decreased/absent lung sounds; **CV collapse/HYPOTENSION** (Adult: **SBP < 90; MAP < 65** or 30% decrease from baseline**),** dysrhythmias; AMS, pre-syncope, syncope/coma

2. **IMC** special considerations: (Resuscitate before intubate)
   - **IMMEDIATELY: EPINEPRINE** (1 mg/1 mL) **0.5 mg IM** (anterolateral thigh) [BLS]
   - **If awake w/ spontaneous ventilatory effort: Consider C-PAP if** MAP at least 60: 5-7 cm PEEP
     If respiratory distress persists and CPAP contraindicated/not tolerated: Rx per ADV Airway SOP
   - **Attempt vascular access** after epinephrine IM
     If No IV / IO: May **repeat EPI** (1 mg/1 mL) **0.5 mg IM** q. 5 min prn | Max total dose 2 mg | Additional doses: OLMC

As soon as vascular access is successful:

3. **IV NS** consecutive 200 mL IVF challenges up to 20 mL/kg; Goal: SBP ≥ 90 (MAP ≥ 65); reassess after each 200 mL **+ EPINEPHRINE** (1 mg/10 mL) titrate in **0.1 mg IVP/IO** doses q. 1 min prn to a **max total dose** [all routes] **of 2 mg**
   Reassess after each 0.1 mg (1 mL) | Additional doses: OLMC
   If on beta blockers & not responding to EPI: **GLUCAGON** 1 mg IVP / IO [ALS] IN / 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]
5. **DIPHENHYDRAMINE 50 mg IVP/IO**; if no IV / IO give IM

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

- Give IVF as rapidly as possible (20 mL/kg; max 2 L) **PLUS**
- **EPINEPHRINE** (1 mg/10 mL) **IV / IO per cardiac arrest SOP** (Above dose limit does not apply)

ASTHMA | COPD

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
   - **Medications:** 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/Gas exchange:** Assess need for DAI/BIAD if near apnea, coma/depressed mental status, exhaustion, severe hypoxia (SpO_2 < 90); hypercapnia ($EtCO_2$ ≥ 60) | CR instability | Impending respiratory failure/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 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, accessory muscle use, 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/ 15 L/BVM if CPAP unavailable or contraindicated
   If SBP falls < 90 (MAP < 65): Titrate PEEP values downward to 5 cm; remove C-PAP if MAP < 60

History of ASTHMA

3. **EPINEPHRINE** (1 mg/1 mL) **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

   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.

4 **If severe distress persists:**
   MAGNESIUM (50%) **2 g** in 16 mL NS (slow IVP/IO) or in 50 mL NS (IVPB) | Give over 10 min - Max 1 g / 5 min
   Cover site with cold moist gauze/cold pack to relieve burning

History of COPD

3. **ALBUTEROL 2.5 mg &** — BLS
   IPRATROPIUM 0.5 mg /HHN/ mask/ BVM
   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 | LARYNGECTOMY

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, $EtCO_2$ (if available); ineffective airway clearance as evidenced by crackles, wheezes; or stridor; need to suction.
   - Type & size of trach or laryngectomy tube (marking on tube flange) | ✓ tube position
   - Tracheostomy cuff to ensure that it is deflated unless on a ventilator or if pt has excessive secretions
   - **Tracheostomy/laryngectomy site**
     - Redness, swelling; character & amount of secretions; purulence, bleeding, subcutaneous emphysema
     - Tracheostomy ties - should be secure but not too tight
     - Need of tracheostomy care
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 "artificial nose" available at scene)
   - Position head of stretcher up 45 degrees or sitting position as patient tolerates
3. **Partial dislodgement of trach tube**: Deflate cuff (if air-filled); advance tube into stoma until flange is flat against neck; reinfate cuff; secure trach tube
4. **Complete dislodgement**:
   - Completely deflate cuff; remove inner cannula if double lumen tube ▪ Insert obturator
   - Lubricate tube including cuff with water soluble gel
   - Gently advance tube into stoma until flange is flat against neck
   - Remove obturator and replace inner cannula; secure trach tube

   In an emergency, insert an appropriately sized ETT into stoma until cuff just passes stoma; assess patency
   Caution: A fresh trach or laryngectomy (<7 days post-op) should only be replaced at hospital
5. **Respiratory distress:** Manually attempt to ventilate through tube. If no resistance; tube is patent. If resistance met:
   - **Tube obstructed?** Attempt to pass suction catheter through trach tube; suction
     - Won't pass/double lumen tube: Remove inner cannula; suction; clear inner cannula of secretions; replace
     - Won't pass/single lumen: Remove and replace trach tube.
       Can't replace? Insert ETT until cuff just passes stoma, or Bag/mask to stoma, or place oxygen over stoma
     - Does pass/distress persists: consider lower airway secretions, pneumonia
     - Maintain head position to open airway maximally
   - **If continued obstruction and/or ventilation/effort inadequate:**
     - If trach not patent after changing; ventilate mask to mouth
     - If no chest rise, peds O_2 mask over stoma or ventilate peds/infant mask to stoma/15 L O_2/BVM
     - 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
6. **LARYNGECTOMY** Tubes/Stomas: Patient eats with their mouth and breathes through the stoma
   - Well healed, mature laryngectomy stoma may not have a tube in place
   - A new laryngectomy that has not fully healed will have a laryngectomy tube; shorter than trach tubes & cuffless
   - **If assisted ventilations needed: Peds BV Mask over stoma (not face); ventilate with approp size bag**
7. **Report to OLMC:**
   - Type of airway: Trach or laryngectomy; type of tube
   - Significant respiratory distress; tube dislodgement; inability to ventilate
   - S&S of local inflammation/infection (redness, swelling, purulent drainage or bleeding); subcutaneous emphysema
   - Changes in character and amount of secretions

Types of trach tubes

- Cuffed vs. un-cuffed (pilot tubing)
- Air or foam cuff; tight to shaft cuff
- Single lumen vs. double lumen
- Disposable vs. reusable inner cannula
- Fenestrated vs. non-fenestrated
- Extra length or capped tubes
- Laryngectomy tubes

ACUTE RESPIRATORY CONDITIONS

INFLUENZA / Possible pneumonia / COVID-19 & other resp. viruses - see IDPH/System protocols

Uncomplicated flu: Fever (100° to 103°F - no fever in some), chills, cough, sore throat, muscle aches, runny or stuffy nose, HA, malaise and fatigue | Vomiting and diarrhea more common in young children
More severe S&S: High fever, shaking chills, pleuritic chest pain, productive cough of thick yellow-green mucus
Complications: **Pneumonia,** ear or sinus infections, dehydration
Suspect pneumonia if: Temp >100°F (37.8°C), productive cough, isolated crackles; SpO_2 < 95%; HR >100

Standard precautions / Disinfection

1. **For close contact** (w/in 6 feet of pt)**: Droplet / Aerosolization Precautions and BSI**
   - Nonsterile gloves for contact w/ potentially infectious material; hand hygiene immediately after glove removal
   - Surgical/procedural **mask on pt** and **mask on each EMS responde**r (surgical/procedural, N95, or other respirator per CDC / IDPH / Local policy)
   - Wear disposable isolation **gown and eye protection** when required by CDC/IDPH guidelines
     Consider when splashes or sprays of respiratory secretions or other infectious material are possible
2. **Disinfect stethoscope heads** and other frequently-handled items after each patient
3. **General recommendation for ambulance:** Thoroughly clean all planes and crevices; spray with System-approved disinfectant registered by the EPA to kill viruses (coronavirus, norovirus, rotavirus, adenovirus) and TB
   If using a spray, hold dispenser 10" from surface and atomize with quick short strokes, spraying evenly on (potentially) contaminated areas until wet. Allow wet dwell time per manufacturer's instructions. Prefer products with 1 minute dwell time. After that, wipe down with a clean towel dampened with clean water then dry thoroughly. Remove/clean residue that may be left behind from disinfectant.

Mild illness/low risk for complications:

4. **IMC: Supportive care.** If w/in 24 hours of onset, encourage pt to contact PCP to receive anti-viral agent. Encourage rest, fluids, and non-aspirin OTC pain relievers and fever reducers. Cough suppressants, decongestants, and antihistamines may alleviate symptoms.

Moderate to Severe S&S | High risk for complications Respiratory/ventilatory failure with severe hypoxemia and hypercarbia may occur in pts with associated pneumonia or exacerbation of underlying comorbid diseases

5. **Give 15 L O_2 / NRM or CPAP as indicated** for ventilatory distress; acute lung injury or ARDS | Assist with BVM if ventilatory failure | Consider need for **ALBUTEROL / IPRATROPIUM** standard dose / HHN or in-line neb
6. Assess for **sepsis:** Time-sensitive pt.

Risk factors for serious complications	
• Asthma; COPD; cystic fibrosis; pulm. fibrosis • Endocrine disorders (diabetes mellitus) • Heart disease (CAD, HF, cardiomyopathies) • Kidney, liver, metabolic disorders • Neurological and neurodevelopmental conditions • Obesity with a BMI of 30 or higher	• Adults 65 years and older • Children < 5 yrs old, but especially those < 2 yrs • Pregnant women and up to 2 weeks post-partum • People in congregate living facilities • Immunocompromised state • Coagulation disorders

Pulmonary embolism: Difficult to diagnose, and potentially lethal if missed.

Time sensitive pt.

Size/location determines S&S. **Consider possible PE if:**

Hx: Previous venous thromboembolism (VTE) or pulmonary embolism; **venous stasis** (obesity, surgery or prolonged immobilization w/in last 30 days); recent trauma/damage to lining of vessels (CV disease: atherosclerotic changes; HTN, injected drug use; central line; or other IV medical device, inflammation from direct infection, diabetes; smoking); **hypercoagulable state** (malignant: cancer currently active or considered cured w/in last year; hematologic (pregnant), or medication induced (oral hormone use). Also consider presence of air, fat or amniotic fluid as source of emboli.

S&S Acute onset pleuritic chest pain; unilateral lower limb pain/edema; tachypnea disproportionate to fever and tachycardia; ↓ SpO_2; small, square **capnography waveform** and very low reading (increased dead space and hyperventilation); HR ≥100; SBP may drop due to HF; cough may be productive with hemoptysis; shock

IMC based on the patient presentation, VS, and signs of shock/instability. 12 L ECG.
Definitive Rx at the hospital of an embolus due to blood clot may be fibrinolysis or thrombectomy – limit scene time

Chest Pain/Acute Coronary Syndrome (ACS) with or w/o pain; ST-segment Elevation Myocardial Infarction (STEMI)

Time sensitive pt

Typical S&S: Pain, discomfort or tightness in the chest, neck, jaw, teeth, back, arm, or abdomen of suspected cardiac origin. May also present w/ dyspnea, sweating, nausea, vomiting, dizziness, fatigue, or weakness and may be associated with presyncope, syncope, acute HF, or shock = **medical emergency.**

Populations with atypical S&S: Elderly, women, diabetics, recent thoracic surgery or trauma

Defer ASA and NTG and use PAIN MGT SOP in pts w/ thoracic trauma or surgery within last 72 hours unless 12-L ECG changes suggest acute ischemia.

1. **Begin immediate IMC** — BLS
   - 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%
   - **Cardiac monitor**; assess for rate, rhythm, pump, or volume problem; hypoperfusion & CR compromise Rx per appropriate SOP.
   - Obtain **medication Hx**; Is pt taking beta-or calcium channel blockers, clonidine, digoxin, anticoagulants, or meds for erectile dysfunction or pulmonary HTN (vasodilators)
2. **ASPIRIN 324 mg** (4 tabs 81 mg) chewed and swallowed while prepping for 12 L ECG
   Indication: Cardiac ischemia due to suspected ACS regardless of chest pain
   Contraindications: Drug appendix + confirmed adequate dose taken after symptom onset; chest pain after trauma
4. **12-L ECG w/in 5 min of pt contact |** Ensure good skin prep & interface | Correct lead placement
   Clear tracing w/o artifact: capture while stationary - may transmit while moving
   - Call **STEMI alert** ASAP if + 12 L ECG changes present (See appendix)

   Communicate & document:

   Clinical S&S (OPQRST) — Pt age, gender, DNR status — PCP/cardiologist if known
   Meds — PMH of AMI, PCI/stent/CABG, chronic kidney disease, or contrast allergy (GWTG)
   ECG rhythm and 12 L findings (transmit/download tracing; if unable - read interpretation to OLMC)
   - **Repeat 12 L ECG** every 10 min if ongoing pain/symptoms
   - Provide ECGs to treating personnel at receiving hospital

NONE to MILD CR compromise + pain/discomfort present Alert, oriented, well-perfused & SBP > 100	**EMERGENT: Moderate CR compromise + pain/discomfort present** Alert, oriented, perfused & SBP 90-100
4. **NITROGLYCERIN** (NTG) **0.4 mg SL** [BLS] (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) [BLS]

6. **Pain persists |** SBP ≥100 (MAP ≥65): Repeat **NTG 0.4 mg SL every 3-5 min X 2;** monitor for SE [BLS]
7. **Pain persists |** SBP ≥90 (MAP ≥65) after NTG or NTG contraindicated: **Rx per PAIN** Mgt. SOP
8. **Transport to primary PCI hospital**/STEMI-Receiving Center if transport time ≤ 30 min
   Goal: First EMS contact to balloon inflation (initial device used) within 90 min (or current AHA guidelines)
   Monitor closely | Clinical deterioration may be rapid: dysrhythmias, chest pain, SOB, decreased LOC syncope, shock/hypotension | Prepare for CPR and defibrillation

CRITICAL (Severe CR compromise): AMS + S&S hypoperfusion; **SBP < 90 (MAP <65)**

4. If HR **less than 60**: Treat per **Bradycardia with a Pulse SOP**
   If HR **60 or above:** Treat per **Cardiogenic Shock SOP**

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

If SBP ≥90 (MAP ≥65): **Sedation** **MIDAZOLAM** standard dose for anxiety/sedation
Pain: Rx per **PAIN** Mgt SOP

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. Problem-focused exam: Assess for rate, rhythm, pump, or volume problem; hypoperfusion and CR compromise
   Goal: Maintain adequate perfusion; treat underlying cause per appropriate SOP:
   Differential: AMI, hypoxia, pacemaker failure, hypothermia, athletes (normal), 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
2. **IMC:** Secure **airway** as needed; **O_2 if** SpO_2 <94% or pt short of breath [BLS]
   Cardiac monitor: ECG rhythm; 12L per ACS SOP (don't delay therapy); oximetry
   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 per PAIN Mgt. SOP
   NTG contraindicated if HR <50

LOWER ACUITY: Stable symptomatic bradycardia

None to mild cardiorespiratory (CR)/**perfusion compromise:** In a compensated state - SBP ≥ 90 (MAP ≥ 65)

Treat via the least invasive manner possible; escalating care as needed to more aggressive treatments.

4. Place TCP electrodes in anticipation of clinical deterioration in pts w/ acute ischemia or MI associated w/ severe sinus bradycardia, junctional rhythm, 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: Bradycardic periarrest

Moderate to Severe CR compromise: Decompensated state with progressive instability related to slow HR and SBP < 90 (MAP <65) AND acute AMS, ischemic 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, or frequent PVCs.
Requires emergent therapy to avert progression to full arrest.

Time sensitive pt

Drugs vs. Pacing

Start with aggressive treatments that are most likely to achieve stability immediately.
After patient is stabilized, the intensity of therapy can be gradually de-escalated.

4. **IV/IO placed: ATROPINE 1 mg rapid IVP/IO |** Repeat 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/contraindicated: NOREPINEPHRINE drip standard dose| Use of IV pump preferred

4. If drugs ineffective or contraindicated; **no IV/IO, or impending hemodynamic collapse**, go directly to **transcutaneous cardiac PACING (TCP)** per procedure **while prepping meds** (contraindicated in severe hypothermia)
   - Start at 60 BPM. May adjust rate to 70 BPM based on clinical response.
   - Increase mA until mechanical capture confirmed by palpable femoral pulse or max 200 mA
   - Evaluate BP once capture is achieved. If mechanical capture present: continue PACING enroute; do not turn off

   If SBP ≥ 90 (MAP≥ 65): Assess indications/contraindications for sedation and pain mgt
   Sedation: MIDAZOLAM or KETAMINE standard doses. If AMS deteriorating: omit sedation
   Pain: **FENTANYL or KETAMINE** standard dose per **PAIN Mgt SOP**

5. If on beta blockers & unresponsive to drugs and pacing: **GLUCAGON** 1 mg IVP/IO [ALS] | IN (NAS) / IM [BLS]

NARROW QRS Complex Tachycardia

With pulse & HR > 100

1. **Consider/treat for possible underlying causes**: pain, fever, dehydration, sepsis, 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
   - Cardiac monitor: ECG rhythm; 12 L per ACS SOP if available (don't delay therapy); oximetry
   - IV NS TKO in proximal vein (AC)┤ If unconscious: defer vascular access until after cardioversion
   - ✓ blood glucose – Rx hypoglycemia per Glucose Emergency SOP
3. **If possible ACS & alert with gag reflex**: Treat Ischemia & pain per ACS SOP | 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** per procedure 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** + 10 mL NS flush (See appendix for dose adjustments; contraindications) 6. **SVT persists or recurs w/in 1-2 min:** **ADENOSINE 12 mg rapid IVP** + 10 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)

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

Time sensitive pt

4. IMC special considerations in conscious patient:
   - May give a brief trial of meds (as above) while prepping to synchronize cardiovert if IV placed and time allows
   - **Sedation** if responsive: **MIDAZOLAM 2-5 mg IVP**/IN May repeat up to 10 mg | OR
     KETAMINE sedation dose | 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
   - AF rarely requires cardioversion by EMS
   - Difficult to determine rhythm onset; consider stroke risk prior to cardioversion (anticoagulated state)

Notes:
- If unresponsive to adenosine/verapamil and questionable QRS width (> 0.10 sec): Refer to Wide Complex Tachycardia with a Pulse SOP (next page)
- DC cardioversion is **ineffective** in junctional and ectopic atrial tachycardias
- *PSVT & A-flutter often respond to lower energy levels, start with 50 J

WIDE COMPLEX TACHYCARDIA with a PULSE

(QRS 0.12 sec or wider) – 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-L 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** mixed with 7 mL NS slow **IVP** or in 50 mL NS **IVPB** over 10 min. May repeat. Complete dose even if rhythm converts. 5. **OLMC only: ADENOSINE** 6 mg rapid IVP + 10 mL NS flush | Contraindication: polymorphic, irregular rhythm	5. **MAGNESIUM** (50%) **2 g** in16 mL NS (slow IVP) or in 50 mL NS (IVPB) | Give over 10 min - Max 1 g / 5 min. Cover IV site with cold moist gauze or cold pack to relieve burning

Chest pain: NTG per ACS SOP if HR drops to ≤ 100 | If pain persists: Rx per PAIN Mgt. SOP

CRITICAL: Severe cardiorespiratory/perfusion compromise (unstable)

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

Time sensitive pt

6. **Sedation** if responsive: **MIDAZOLAM 2-5 mg** IVP/IN May repeat up to 10 mg | OR
   KETAMINE sedation dose | If condition deteriorating, omit sedation
7. **Monomorphic VT** (see above): **Synchronized CARDIOVERSION** starting at **70-100-J** (manufacturer-specific)
   Confirm reliable QRS wave synchronization on monitor – if not present, switch to a different lead
   If synch impossible and clinical condition critical: go immediately to unsynchronized defibrillation
   All polymorphic VT / Torsades de pointes: DEFIBRILLATE at device & AED specific J see below
   - Assess ECG and pulse after each shock delivery
   - Treat post-cardioversion dysrhythmias per appropriate SOP

VT persists

8. **AMIODARONE 150 mg** mixed with 7 mL NS **slow IVP** or in 50 mL NS **IVPB** over 10 min.
   Contraindicated: Torsades, AV blocks, IVR, or ventricular escape beats
9. **Synchronized cardioversion at device-specific J** after ½ of the AMODARONE dose (75 mg)
   Complete medication dose even if pt converts after cardioversion if SBP ≥ 90 (MAP≥ 65)

Note: Look at 12-L ECG printout for an analysis of the **QT intervals** based on gender and heart rate

Energy recommendations for VT		
Manufacturer	Adult Synch **Cardioversion** J	Adult **Defib** J
LifePak	100 – 150 – 200 – 300 - 360	200 – 300 - 360
Philips	100 – 150 - 200	150 – 170 - 200
Zoll all series	70 or 75 -120 – 150 - 200	120 – 150 - 200

CARDIAC ARREST (VF/PVT/Asystole/PEA) Adult & Peds

General expectations:
- Use "Team" approach and bundles of care (multiple simultaneous steps) per SOPs/local policy/procedure.
- Steps generally organized around 2 min cycles in C-A-B priority order unless hypoxic event, pregnant, or a child
- **Continue resuscitation at point of contact for at least 30 min**. **Exceptions**: Unsafe environment/adverse climate; pt needs intervention not immediately available on scene (PTCA, REBOA, ECMO); penetrating trauma; pregnant; ROSC

PRIMARY ASSESSMENT

Verify scene **SAFETY** | determine **UNRESPONSIVENESS** | open **AIRWAY** (head tilt/chin lift if no SCI or jaw thrust) | assess **BREATHING**/gasping | **SUCTION** prn | simultaneously **check PULSE**
- If apneic/gasping & no pulse (in 10 sec): Assume cardiac arrest. Is CPR indicated or contraindicated?
- Attempt to determine down time: Electrical (0–5 min); Circulatory (6–10 min); Metabolic (> 10 min) phases

CPR
- If indicated, start **high quality,** minimally interrupted **MANUAL CPR** w/in 10 seconds of arrest recognition. Use audible prompt for correct rate + **real-time CPR feedback** device until a mechanical CPR device is deployed
- **13+ yrs/no contraindications after manual CPR started:** Deploy **Mechanical CPR device** ASAP (if available and meets protocol) to maintain uninterrupted chest compressions | Pause compressions < 5 sec to place device
- **No CPR device or contraindicated:** Continue 2 person manual CPR (adult, child, infant)

CPR caveats:
- **DNR status unclear**: Start CPR; stop if valid POLST/DNR order is presented or per OLMC order
- **LifeVest®** on: Disconnect batteries | remove vest | resuscitate per SOP
- Pulseless & **VAD placed**: ✓SpO_2 | DO NOT disconnect batteries | See VAD SOP; call VAD Coord for instructions
- **Pregnant** & fundus at navel or higher: CPR + manual left lateral uterine displacement; stop magnesium if running

- **GIVE OXYGEN: BLS airways:** Maintain manual airway positioning + NPA/OPA | **O_2 15 L/ NC $EtCO_2$** sensor Hold BV mask over $EtCO_2$ NC w/ tight mask seal to reduce O_2 leak
- **13+ yrs: Add RQP** above mask to maintain negative intrathoracic pressure unless contraindicated **Contraindications**: Flail chest, pulse present; children ≤12 years
- Place SpO_2 central sensor; observe (trend) reading and pleth waveform

Immediate vs. Delayed BLS Positive Pressure VENTILATIONS (PPV)

Ventilate immediately: Cardiac arrest caused by hypoxic event (asthma, anaphylaxis, submersion, drug OD etc.), unwitnessed arrest; pregnant, peds ≤12 years
Adult 10 BPM (asthma 6-8 BPM) | **child** (1 breath q. 6 sec) each over 1 second; see visible chest rise (adult: 500-600 mL) + bilateral breath sounds midaxillary lines
Avoid hyperventilation, high airway pressure (≥25 cm H_2O) & gastric distention

O_2 w/o ventilation (ApOx): EMS witnessed arrest and/or found in a shockable rhythm: Manual airways + O_2 as above **No** ventilations for first 3 mins.

EARLY DEFIBRILLATION (VF & Pulseless VT)

APPLY DEFIB PADS on exposed chest w/o interrupting compressions (anterolateral or anteroposterior)
Connect to cardiac monitor [ALS] / **AED** [BLS] (See Peds IMC p. 72 for peds pad sizes)

✓ RHYTHM: Does monitor sense native rhythm with CPR in progress?
- **CPR device** + **monitor senses ECG**: No pause in compressions to ID rhythm
- **NO CPR device/monitor does not sense ECG:** Palpate femoral pulse for 5 sec with compressions in progress | **pause compressions ≤ 5 sec**. to check rhythm | Resume compressions immediately **Can't ID rhythm**: Print strip during pause; resume compressions; read ECG from printed strip

Not shockable: Continue compressions	**Shockable: DEFIBRILLATE immediately**

JOULES (rapidly measure child with length-based tape)
- **Adult and peds ≥ 50 kg**: Monitor-specific joules (see bottom of next page)
- **Peds** < 50 kg: 2 J/kg then 4 J/kg | subsequent shocks ≥ 4 J/kg not to exceed 10 J/kg or adult max

Defibrillation caveats
- **Perishock pause**: With CPR device: None | NO CPR device: ≤ 5 sec (Pre-charge w/ compressions ongoing) | Discharge current after a compression - not a ventilation | Immediately resume compressions)
- NO CPR device: **Change compressors** q. 2 min (immediately after defib or sooner if fatigued)
- NO rhythm/pulse check until after 2 min of CPR unless evidence of ROSC
- Continue to defibrillate shockable rhythms per above procedure in 2 minute cycles
- If very **fine VF and/or $EtCO_2$ low or decreasing:** ✓CPR quality – attempt to improve perfusion/ventilation
- **Persistent/refractory VF**: Change defib pad location if possible

ALS interventions: Priority order – IV/IO access | EPINEPHRINE | Adv. airway

1. VASCULAR ACCESS:
May consider IO (approved site) if attempts at IV access are unsuccessful or not feasible.
NS TKO unless IVF indicated per condition
When placed, give meds w/o CPR interruption

2. Early EPINEPHRINE (Non-shockable rhythm: as soon as feasible | Shockable: after initial defibs)
EPINEPHRINE (1 mg/10 mL) IVP / IO
Repeat every **6 min** as long as CPR continues
- **Adult:** 1 mg (each dose)
- **Peds:** 0.01 mg/kg (0.1 mL/kg) (max 1 mg/dose)
  Use dosing chart in Appendix

3. Consider ADVANCED Airway 3 min after preox
ETI (preferred in adults) limit 2 attempts per DAI SOP/**BIAD** (adults & peds)
Place w/o pausing CPR | Cont. O_2 15 L/$EtCO_2$ NC until placed
Keep head of bed flat if using CPR device
Confirm correct placement & secure / ADV airway SOP
Tower of Power: Airway | $EtCO_2$ | HEPA filter (product-dependent) | ITD (RQP) | Zoll Accu-vent | BVM (D/C NC $EtCO_2$)
PPV: O_2 15 L/BVM at 10 BPM with continuous chest compressions. Volume only to see visible chest rise and bilateral breath sounds at midaxillary lines. May adjust peds to 20 BPM based on SpO_2 / $EtCO_2$. Don't over ventilate.

Antidysrhythmic agent only if SHOCKABLE RHYTHM

AMIODARONE IVP/IO	Adult: 300 mg	Peds: 5 mg/kg (Max 300 mg)
Rhythm persists after 5 min:	Adult: 150 mg	Peds: 5 mg/kg (May repeat up to 3 total doses)

Consider & Rx reversible causes: Hs & Ts (May use ultrasound to ID reversible causes or ROSC)

- Hypoxia (ventilate/O_2)
- Hypothermia (core rewarm)
- Hypovolemia/dehydration (IVF boluses)
- Hypo/**hyper**kalemia (bicarb-responsive acidosis (DKA; TCA /ASA OD, cocaine, diphenhydramine):
  SODIUM BICARB 1 mEq/kg (max 50 mEq) IVP/IO
  (routine use of sodium bicarb in an undifferentiated cardiac arrest is not recommended)
- Tamponade, cardiac
- Thrombosis (coronary/pulmonary)
- Tension pneumothorax (pleural decompression)
- Toxins **Opioid OD**: **NALOXONE**
  Adult: 1 mg IVP/IO; repeat q. 2 min. up to 4 mg from EMS
  Peds 0.1 mg/kg IVP/IO (max 1 mg); repeat as above
  Additional doses: OLMC

Return of spontaneous circulation (ROSC): Rapid, sustained rise in $EtCO_2$ (≥40); pt moves; wakes up
FOCUS: Oxygenation, circulatory support, lung-protective ventilation, adequate sedation; 12 L ECG
Time-sensitive pt

- **Remove RQP |** Assess VS + SpO_2 & $EtCO_2$: palpate **pulse & watch SpO_2 pleth for 5 minutes** to detect PEA
- **Support ABCs**; **Target** SpO_2 (92-98%), $EtCO_2$ (35-45) | **Adult** SBP > 90 (MAP > 65) | **Child** SBP >70 + (2 X age)
  PPV prn 10 BPM w/ visible chest rise; do not hyperventilate even if ↑ $EtCO_2$
  If ETI/BIAD placed and pt remains unconscious: Assess need for pain mgt/sedation (RASS score) per DAI SOP
  Obtain12 L ECG (as soon as feasible - target within 8 min) after ROSC (call alert if STEMI)

  Emergent Rx if hypotensive | cardiogenic shock | mechanical circulatory support needed

  If lungs clear: IV NS 20 mL/kg up to 1 L while prepping…
  NOREPINEPHRINE drip (IV/IO) Concentration: 4 mg in 1,000 mL NS (4 mcg/mL) | Use of IV pump preferred
  Adult: Initial dose: 8 mcg/min (2 mL/min) titrated to reach SBP ≥ 90 (MAP ≥ 65)
  Peds: Initial dose: 0.1 mcg/kg/min (max 1 mcg/kg/min up to 8 mcg/min) titrated to SBP >70 + (2 X age in yrs)
  Higher doses (10 mcg/min) RARELY needed – contact OLMC. Assess BP (MAP) q. 2 min until target BP is reached (don't overshoot) | Then reduce drip rate incrementally to maintain at BP targets
  Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) or less | Continue to reassess BP q. 5 min.
- Monitor for **SEIZURES:** Rx per SOP | ✓ **GLUCOSE** level: Rx hypoglycemia per SOP; avoid hyperglycemia

Determination of Death | TERMINATION OF RESUSCITATION (TOR) |
Must be approved by OLMC physician

BLS TOR Rule: Arrest Unwitnessed by EMS/1st responders | No ROSC before transport | no AED shocks (intentionally) delivered
ALS TOR Rule: Arrest unwitnessed by anyone | No bystander CPR | No ROSC after full ALS | No defib before transport
Addtl. Considerations: Normothermic pt. remains in persistent monitored asystole for ≥ 30 min despite resuscitation | $EtCO_2$ remains ≤ 10 mmHg for 20 min in pts with advanced airways & no reversible causes of arrest identified
If TOR denied: Transport with CPR in progress after 30 min of resuscitation on scene
If TOR granted: Note time resuscitation was terminated | Follow System policy for patient disposition

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

Adult Defibrillator Joule recommendations	
LifePak	200 – 300 - 360
Philips	150 – 170 - 200
Zoll all series	120 – 150 - 200

HEART FAILURE | PULMONARY EDEMA | CARDIOGENIC SHOCK

- **HF**: Structural or functional impairment of ventricular filling or ejection of blood. Assess for hypoperfusion and cardiorespiratory (CR) compromise.
- **Obtain PMH/comorbidities:** CAD/ACS/AMI, HTN, valvular heart disease, rhythm-related (tachycardia, PVCs, RV pacing); cardiomyopathies, infiltrative disease (amyloid/sarcoid/excess iron); rheumatic or autoimmune /endocrine or metabolic causes; myocarditis (infectious, toxin or medication, immunological, hypersensitivity); cardiotoxicity with cancer; SUD (alcohol, cocaine, and methamphetamine); or pregnancy-related. Consider pulmonary embolism.
- **Assess for clinical congestion**: JVD, orthopnea, peripheral edema; auscultate lung sounds all lobes, front & back; report timing/location of wheezes/crackles | Differentiate HF from COPD/asthma by PMH, meds, S&S, $EtCO_2$

PULMONARY EDEMA: Low Acuity to Emergent | Mild to moderate CR compromise | Alert, (SBP ≥ 90 & DBP ≥ 60) (MAP ≥ 65)

1. **IMC** special considerations: — BLS
   - Position patient sitting upright at 90˚ (if tolerated); dangle legs over sides of stretcher
   - **C-PAP** 5-10 cm PEEP | If SBP < 90 (MAP < 65): Titrate PEEP down to 5 cm; remove if MAP < 60
     If resp. distress & CPAP contraindicated/not tolerated: Assess need for ADV airway [ALS]; O_2 15 L/NRM
2. **12-L ECG & ASPIRIN 324 mg** (4 tabs 81 mg) PO per ACS SOP unless contraindicated
3. **NITROGLYCERIN** 0.4 mg SL | If SBP ≥ 90 (MAP ≥ 65): Repeat NTG 0.4 mg SL q. 3-5 min – no dose limit
   May be given if HR > 100 in pulmonary edema | monitor BP closely
4. Severe anxiety: **MIDAZOLAM** (standard dose) per ACS SOP — ALS

CARDIOGENIC SHOCK (CRITICAL): Pump failure due to PMH above &/or drugs with SBP < 90; MAP < 65 + S&S hypoperfusion — Time sensitive pt

1. **IMC** special considerations:
   - Assess need for advanced airway to ↓ WOB, protect airway, or if PPV indicated
   - Assess for hypovolemia / dehydration
2. If hypovolemic and/or dehydrated - **lungs clear** + **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/IO per inopressor SOP | Use of IV pump preferred
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)	
Angiotensin Receptor-Neprilysin Inhibition (ARNi): Sacubitril-valsartan	**HCN Channel blocker**: Ivabradine (Colanor, Lancora, Procoralan)
Anticoagulants: apixaban (Eliquis), aspirin, argatroban, bivalirudin (Angiomax), clopidogrel (Plavix), dabigatran (Pradaxa), endoxaban (Savaysa/Lixiana), eptifibatide (Integrilin), lepirudin (Refludan), presugrel (Effient), rivaroxaban (Xarelto), ticagrelor (Brilinta), ticlodipine (Ticlid), warfarin (Coumadin, Jantoven); SUBQ route: dalteparin (Fragmin), enoxaparin (Lovenox), fondaparinux (Arixtra), tinzaparin (Innohep); Heparin (IV & SUBQ)	
Beta Blockers: acebuto***lol*** (Sectral), atenolol (Tenormin), betaxolol (Betopic,Kerlone), bisoprolol (Zebeta), carvedilol (Coreg), esmolol (Brevibloc), labetalol (Normodyne, Trandate), levobunolol (Betagan), metoprolol (Lopressor/Toprol), Kapspargo Sprinkle (metoprolol succinate extended-release), 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, torsemide	
Mineralocorticoid Receptor Antagonists (MRAs): spironolactone (Aldactone); eplerenone (Inspra); finerenone (Kerendia)	
Sodium-glucose cotransporter-2 inhibitors: canagliflozin (Invokana); dapagliflozin (Farxiga); empagliflozin (Jardiance)	
Vasodilators: hydralazine (Apresoline), isosorbide dinitrate (Isordil), minoxidil (Loniten), nesiride (Natrecor), Nitrates/NTG	
Aldosterone antagonists: (K sparing diuretics) Eplerenone, spironolactone (Aldactone); triamterene (Dyrenium)	

Ventricular Assist Device (VAD)

Purpose: Improve survival and minimize morbidity in patients with end stage heart failure (HF).

The current generation of VADs have a number of components in common: an inflow cannula is inserted in the left ventricular (LV) apex that drains blood from the LV to the pump; an electrically actuated continuous-flow (CF) pump with a single rotating impeller suspended within a tube propels blood forward by spinning at high speeds; and an outflow cannula carries blood back to the arterial circulation, typically by way of the ascending aorta.

The power supply for the VAD is a percutaneous lead that traverses the skin and connects the external power system with the internal pump. The external components generally consist of a power source (i.e., batteries or an alternating current power unit) and a small portable controller that controls pump speed and monitors device function.

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

   EMS personnel are authorized to follow directions of the VAD Coordinator
2. **Patient may/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 - see below**.

   Follow all other BLS and ALS protocols.
5. Patients with VADs may tolerate sustained ventricular arrhythmias with minimal hemodynamic instability because the VAD maintains cardiac output during arrhythmic events. 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 and are at risk for thromboembolic events.
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/record nature & amount of vomiting/diarrhea, vaginal/urethral/rectal lesions/discharge; 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
   - Rx per **PAIN Mgt. SOP**

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

Time sensitive pt

Altered sensorium, signs of hypoperfusion.

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 (MAP <60) mmHg

DIALYSIS | Chronic Renal Failure Emergencies

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

1. **IMC** special considerations:
   - NO BPs, venipunctures, or IVs performed on an extremity with an AV fistula or graft
   - If 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 vascular access site, request their assistance to connect IV tubing
2. Treat per appropriate SOP with special considerations listed below

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

Time sensitive pt

Occurs with renal failure, during dialysis due to rapid removal and acute reduction in fluid volume; hemorrhage, cardiogenic shock, sepsis, electrolyte disorders, anaphylaxis, pericardial tamponade, or pulmonary embolism

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

Tall, peaked T waves, flattened or absent P waves, prolonged PRI, widening QRS, bradycardia, sine-wave pattern, IVR, cardiac arrest | High index of suspicion if on lisinopril (retains K); generalized fatigue, weakness, flaccid paralysis, paresthesias, palpitations, dyspnea, chest pain, nausea or vomiting

2. Treat dysrhythmias per appropriate SOP with one or both of 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]
3. Magnesium sulfate is contraindicated

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,** cognitive functioning per AMS, and decisional capacity SOP
     If GCS 8 or less: Assess need for ADV airway
   - Assess **hydration status**: If dehydrated: sequential IV NS 200 mL fluid challenges up to 1 L
   - Assess for **hallucinations, delusions, tremors, depression, anxiety** (see below)
   - Ask patient about PMH of alcohol use disorder (AUD); time and amount of last alcohol ingestion
2. **If combative or uncooperative:** Attempt verbal de-escalation | Seek LEO assistance
   Sedation & monitoring per PSYCH/BHE SOP | Apply mechanical restraints prn per procedure
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 a max total dose of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated
   - If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); on opioids/CNS depressants: ↓ total dose to 0.1 mg/kg
5. **If altered mental status**, **seizure activity, or focal neurologic deficit:**

   Obtain blood glucose level
   - **If < 70**: **Rx per Glucose emergencies SOP |** Observe/record response; recheck bG level
   - **If ≥ 70**: Observe and continue to assess patient
6. **Alcohol withdrawal symptoms -** S&S may appear within 8 hrs of last drink, peak in 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/IO unable/IN contraindicated: **5-10 mg** (0.1-0.2 mg/kg) **IM** (single dose)
   - All routes: May repeat to a max total dose of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated
   - If hypovolemic, elderly, debilitated, chronic Dx (HF/COPD); on opioids/CNS depressants:
     ↓ total dose to 0.1 mg/kg
7. Transport. Ongoing assessment enroute.

Notes: A patient who is **impaired may lack decisional capacity: Assess per Decisional Capacity Worksheet**
If lacking decisional capacity, they may not consent nor dissent to care and/or transport

Medication assisted treatment for AUD: baclofen, disulfiram, naltrexone, topiramate, acamprosate

Alcohol-related psychosis manifests as prominent hallucinations (usually visual) and delusions. For pts with alcohol-use disorder, psychosis can occur during acute intoxication or withdrawal, with or without delirium tremens

Differentiating alcohol-induced psychosis from schizophrenia: Later onset of psychosis, higher levels of depressive and anxiety symptoms, fewer negative and disorganized symptoms, better insight and judgment toward psychotic symptoms, and less functional impairment

ALTERED MENTAL STATUS (AMS) / SYNCOPE

AMS: Consider possible etiologies; Rx / appropriate SOP

- **A**: Alcohol, ACS/HF, arrhythmias, anticoagulation; acid-base imbalances (acidosis/hypercarbia)
- **E**: Endocrine/exocrine (thyroid/liver/pancreas/adrenals); electrolyte and fluid imbalances; ECG abnormalities/dysrhythmias: prolonged QT; Brugada syndrome (incomplete RBBB pattern in V1/V2 w/ ST segment elevation)
- **I**: Insulin disorders: hypo or hyperglycemia; DKA/HHNS
- **O**: O_2 deficit (hypoxia), opioids, OD, occult blood loss (GI/GU)
- **U**: Uremia; CKD, other renal causes including hypertensive problems
- **T**: (recent) Trauma, temperature changes, toxins
- **I**: Infections (neurologic and systemic); infarction
- **P**: Psychological; (massive) pulmonary embolism
- **S**: Space occupying pathology (epi or subdural, SAH, intracerebral hemorrhage, tumors); stroke, sepsis, shock, seizures, SUD

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/pt about S&S immediately prior to and during change in mentation; duration of event, and resolution of event (spontaneous, after interventions)

Special considerations

- **A**ffect | **B**ehavior | **C**ognition (ability to answer simple questions) | Insight | Hallucinations/delusions
- Memory or speech deficits
- Inspect for Medic alert jewelry, tags, body art indicating PMH
- Consider vulnerability factors: older age, dementia, functional impairment, malnutrition, substance use disorder
- General appearance; odors on breath; evidence of alcohol/substance use disorder; trauma
- **VS**: Observe for abnormal respiratory patterns; ↑ or ↓ T; orthostatic changes
- **Skin**: Lesions that may be diagnostic of the etiology
- **Neuro/Disability**: GCS | Assess for seizure-like activity or S&S of post-ictal state (loss of bowel tone; incontinence, oral trauma, active nystagmus or fasciculations) | Pupils/EOMs/visual deficits | Spontaneous movements: unilateral deficit suggests stroke (complete stroke screen) / bilateral deficits below a certain level suggests spinal cord syndrome (full motor/sensory exam) | ✓altered sensory perception | nuchal rigidity
- Pain: Facial expression, body movements, muscle tension, vocalization

1. **IMC** special considerations:
   - ABCs: Suction prn; seizure/vomiting/aspiration precautions
   - **GCS ≤ 8**: Consider need for ADV airway
   - SBP < 90 (MAP < 65) & lungs clear: **NS IVF challenges** (consecutive 200 mL increments to 1 L)
   - **Position** patient on side unless contraindicated | Suspicion of trauma: SMR
     If supine: Maintain head and neck in neutral alignment; do not flex neck
   - **Monitor** for S&S of ↑ ICP: reduce environmental stimuli
   - **Document** changes in GCS, VS, oximetry, ECG, and neuro exam
2. Obtain and record **blood glucose level**
   - **If < 70** : Rx per Glucose Emergencies SOP | Observe/record response; recheck bG level
   - **If ≥ 70**: Observe and continue to assess patient
3. **Possible opioid toxicity** w/ AMS & respiratory depression/arrest (may not have small pupils):
   NALOXONE 1 mg IVP / IO [ALS] | IN / IM [EMR / BLS]
   May repeat q. 2 min until breathing adequate up to 4 mg per EMS | Additional doses: OLMC

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

Syncope: Loss of consciousness and loss of postural tone | Abrupt onset, resolves quickly

Risk factors for adverse outcomes: Older age, structural heart disease, history of CAD

Syncope vs. seizure: Assess for PMH of seizure disorder + S&S as stated above.

DRUG OVERDOSE | POISONING

Case by case determination if time sensitive

GENERAL APPROACH

1. **History**: PMH of SUD? Determine route: ingestion, injection, absorption, or inhaled; pts often unreliable historians
2. **IMC** special considerations:
   - Uncooperative behavior may be due to intoxication/poisoning; assess for underlying pathology
   - Anticipate hypoxia, hypercarbia, respiratory and/or cardiac arrest, hyper or hypotension, dysrhythmias, vomiting, seizures, AMS (coma) | **Monitor ECG | SpO_2 | $EtCO_2$ in all pts with AMS or given sedatives**
   - Assess need for ADV 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/nondecisional pts may not refuse treatment/transport
3. AMS, seizure activity, or focal neurologic deficit: ✓ **bG**; If <70: Rx per Glucose Emergencies SOP

STANDARD DOSING GUIDELINES

Possible opioid toxicity w/ AMS + respiratory depression/arrest: **NALOXONE 1 mg** IVP/IO [ALS] | IN / IM [EMR / BLS]
May repeat q. 2 min until breathing adequate up to 4 mg per EMS | Additional doses: OLMC

Anxiety/serotonin syndrome: MIDAZOLAM 2 mg slow IVP q. 2 min (0.2 mg/kg IN) **up to 10 mg** titrated to response

Tonic-clonic seizures: MIDAZOLAM 2 mg IVP/IO q. 30-60 sec (0.2 mg/kg IN) **up to 10 mg** titrated to stop seizure
If IV/IO unable/IN contraindicated: **5-10 mg** (0.1-0.2 mg/kg) **IM** (single dose)
All routes: May repeat to a max total dose of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated

If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or have taken opioids, alcohol, or CNS depressants:
↓ total dose to **0.1 mg/kg** (½ normal dose) for anxiety

Violent/combative/undifferentiated delirium w/severe agitation: Carefully estimate weight (Appendix)
KETAMINE SEDATION DOSE: 2 mg/kg slow IVP/IO (over 1 min) or 4 mg/kg IN/IM (not to exceed 300 mg by SOP)
Recommended approach: Combination of doses/routes to achieve desired sedation within max dose by weight
- Up to 50 mg (1 mL) each nostril IN (unless contraindicated) may repeat within 90 seconds AND/OR
- Up to 150 mg (3 mL) IM (may use both anterolateral thighs through clothing prn)

If combativeness persists: Contact OLMC for additional dosing
Use caution in pts with active psychosis | Frequently monitor/document mental status, VS, SpO_2, $EtCO_2$, ECG

BETA BLOCKERS: "LOLs" – See Common Drug Classifications listing

4. HR <60 & SBP <90 (MAP <65): & **UNRESPONSIVE to drugs & pacing** per Bradycardia w/ Pulse SOP:
   GLUCAGON 1 mg IVP/IO [ALS] | IN (NAS) / IM [BLS]

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

4. Hypotension**: IV/IO NS wide open up to 1 L**
5. **Wide QRS: SODIUM BICARBONATE 1 mEq/kg IVP** (max single dose 50 mEq)
   Repeat if ↓ BP, deterioration of mental status, wide QRS persists, or dysrhythmias

DEPRESSANTS: Barbiturates: Phenobarbital, Seconal (secobarbital) I **Benzodiazepines:** diazepam (Valium), midazolam (Versed), lorazepam (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

4. Observe for CNS and/or respiratory depression, apnea, nystagmus, ↓ P, ↓ BP, or seizures | Supportive care

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

4. **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).
5. Rx Na channel blockade with **SODIUM BICARBONATE** (See cyclic antidepressants)

DRUG OVERDOSE | POISONING cont.

Case by case determination if time sensitive

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 are 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

4. 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, and bone marrow and severely damage the brain. Can suffer from "sudden sniffing death" from a single inhalant use.

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

OPIOIDS: Codeine, fentanyl (carfentanil, Duragesic, Sublimaze, Actiq); heroin, hydrocodone (Vicodin, Norco, Lortab, Lorcet); hydromorphone (Dilaudid, Exalgo, Opana ER); meperidine (Demerol); methadone (Dolophine, Methadone, 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

4. AMS + RR <12 (pupils may not be small): **NALOXONE standard dosing** (determine dose given by others)
   If no response to naloxone; consider alternate substance or cause of AMS
5. Anticipate acute withdrawal | Assess need for sedation/restraints | Monitor for HTN after reversal if stimulants co-used

ORGANOPHOSPHATES (cholinergic poisoning):
Insecticides: Malathion, parathion, diazinon, fenthion, dichlorvos, chlorpyrifos, ethion | **Antihelmintics**: Trichlorfon
Nerve gases: Soman, sarin, tabun, VX | **Ophthalmic agents**: Echothiophate, isofluorphate | **Herbicides**: Tribufos (DEF), merphos

S&S: **"SLUDGEM" reaction** (salivation, lacrimation, urination, defecation, GI distress, emesis, miosis (pinpoint pupils) + **Killer Bs: B**ronchorrhea, **Br**onchospasm, **B**radycardia (muscarinic).| Tachycardia may occur with nicotinic toxicity

4. Remove from the contaminated area; decontaminate as much as possible before moving to the ambulance
5. **ATROPINE 1 mg rapid IVP**/IO. Repeat q. 3 min until secretions diminish (usual dose limit does not apply)
   Cholinergic poisonings cause an accumulation of acetylcholine. Atropine blocks acetylcholine receptors, thus inhibiting parasympathetic NS 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, hyperreflexia, 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.

Toxicity: Sympathomimetic effects (↑ HR, BP, & Temp, diaphoresis); dysrhythmia, coronary artery vasospasm with ACS; stroke; agitation; visual hallucinations, persecutory delusions, S&S that resemble schizophrenia acute psychosis

4. Supportive care; prepare to secure pt safety with sedation / restraint if necessary
   Treat tachycardia, dysrhythmias, cardiac ischemia, and hyperthermia per appropriate SOP
5. **If generalized tonic clonic seizure activity, anxiety, severe HTN: MIDAZOLAM** standard dosing
6. **If violent, combative, uncooperative, delirium w/ severe agitation: KETAMINE** standard sedation dose
7. **If hallucinations**: Quiet environment devoid of stimulation (lights, noise, and touch)

CARBON MONOXIDE POISONING

Time sensitive if critical

Mild: variable and nonspecific. Tension-type headache, dizziness, flu-like S&S without a fever, drowsiness, chest pain, AMS

Mod-Severe: Tachycardia, tachypnea, hypotension, metabolic acidosis, dysrhythmias, myocardial ischemia or infarction, noncardiogenic pulmonary edema, irritability, impaired memory, cognitive and sensory disturbances, ataxia, altered or loss of consciousness, seizures, coma, and death

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** as indicator 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 run as high as 10%); use manufacturer standard levels if given; carefully assess for clinical correlation due to questionable device sensitivity.
2. **Patient disposition**: Transport lower acuity/stable patients to nearest hospital

   HBO indicated: Witnessed or suspected loss of consciousness | Neurological deficit | Ischemic cardiac changes | Significant metabolic acidosis ($EtCO_2 \leq 31$) | Pregnant (consult with OLMC)

   CRITICAL: If in respiratory/cardiac arrest or airway unsecured: transport to nearest hospital

Hyperbaric oxygen (HBO) chambers

Advocate Lutheran General Hospital	847/ 723-5155	24/7
Aurora St. Luke's Medical Center (Milwaukee)	414/ 385-2500	24/7

CYANIDE EXPOSURE (CRITICAL) Adults & Peds

Time sensitive patient

Consider in presence of smoke inhalation and industrial situations (silver recovery, electroplating solutions, metal cleaning, jewelry cleaners). Metabolic product of the drug amygdalin (laetrile).

Assess for headache, rapid onset confusion/disorientation, dyspnea, chest tightness, nausea; tachypnea/hyperpnea (early); bradypnea/apnea (rapidly follows); rapid CV collapse, CNS depression, seizures/coma; metabolic acidosis, dilated pupils; soot in nose/mouth/ oropharynx or respiratory secretions

1. PPE including SCBA; evacuate danger area; OLMC ASAP so receiving hospital is prepared for your arrival
2. **IMC** per **Drug OD/Poisoning SOP** (adult/peds); CPR and Cardiac Arrest SOP as indicated.
   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. as able
3. Per OLMC and if available: Cyanokit: **HYDROXOCOBALAMIN**
   Adults: 5 g IV (one vial) given IVPB (shut off main IV line) over 15 minutes (15 mL/min).
   Peds: 70 mg/kg over 15 min not to exceed 5 g – see dosing chart below
   May repeat X 1 and response inadequate to 1st dose. Max total dose 10 g.

Peds dosing: Hydroxocobalamin									
Wt/kg	Dose	Unit	Volume	**Vol / min**	Wt/kg	Dose	Unit	Volume	**Vol / min**
2	140	mg	5.6 mL	22 mcgtts	20	1.4	g	56 mL	3.7 mL
3	210	mg	8.4 mL	34 mcgtts	25	1.8	g	70 mL	4.6 mL
4	280	mg	11.2 mL	45 mcgtts	30	2.1	g	84 mL	5.6 mL
5	350	mg	14 mL	1 mL	35	2.5	g	98 mL	6.5 mL
10	700	mg	28 mL	1.8 mL	40	2.8	g	112 mL	7.4 mL
15	1.1	g	42 mL	2.8 mL	45	3.2	g	126 mL	8.4 mL

Drops per minute depend on macrodrip IV tubing calibration: 10, 15 or 20 drops/mL

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

Environmental: COLD Emergencies (Adult & Peds)

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 or break blisters
   - Protect with light, dry, sterile dressings; cover with warm blankets and prevent re-exposure
3. Anticipate severe pain when rewarming: Rx per **PAIN Mgt SOP**

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 pt in warm environment, remove wet clothing/dry; 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 frostnip or 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); slowed speech/ataxia (mimics stroke), muscle rigidity, slow RR, CO_2 retention, pupils dilated & minimally responsive

2. **Passive rewarming** (T > 93.2° F): Cover with blankets; protect head from heat loss
   Active external rewarming (T 82°- 93.2° F): Passive + **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 (Peds: 10 mL/kg) to maintain hemodynamic stability

SEVERE Hypothermia (CRITICAL): Core temp < 30°C (86° 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** (generally not available in field). Rewarm trunk only with hot packs; avoid rewarming extremities
   - **Consider need for ADV airway:** If indicated; use gentle technique to prevent vagal stimulus and VF
   - O_2 12-15 L/NRM or BVM (warm O_2 to 42˚ C / 107.6° F if possible); do **NOT** hyperventilate - chest will be stiff
   - **Vascular access: Warm NS** 200 mL (peds 10 mL/kg) IVP/IO fluid challenges up to 1 L
     May require large volume replacement due to leaky capillaries, fluid shift, and vasodilation as rewarming occurs
3. If unresponsive with apnea or no normal breathing (only gasping) check for a pulse.
   - Pulse not definitely felt in 30 seconds: Start CPR - **TRIPLE ZERO CANNOT BE CONFIRMED** until rewarmed unless obviously dead (rigor mortis or non-survivable injury) | Treat per CARDIAC ARREST SOP + rewarming
4. **ROSC**: Support CV status per CARDIAC ARREST SOP | Look for & treat causes of severe hypothermia
   - If induced hypothermia (TTM) 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/DROWNING (Adult & Peds)

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 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
     - Wear protective garments if water temp is < 70˚ F | Attach a safety line to the rescue swimmer
     - In-water ventilations may be considered by trained rescuers, preferably with a flotation device | chest compressions should not be attempted in the water
     - Keep pt. in a horizontal position if possible. Cold-induced hypovolemia, cold myocardium, and impaired reflexes may cause significant hypotension.
     - **If hypothermic:** Appropriate rewarming indicated concurrent with resuscitation
   - SMR only if circumstances/clinical S&S suggest a spine injury
   - SpO_2 may be unreliable, particularly after cold water immersion, but can increase FiO_2 to meet ITC targets

EMERGENT: Awake with good respiratory effort, yet congested and increased work of breathing:

2. O_2 /**C-PAP** to deliver 5-10 cm PEEP | Use 15 L/NRM if CPAP unavailable or contraindicated
   If SBP < 90 (MAP < 65) or hypotensive for age: Titrate PEEP down to 5 cm; remove C-PAP if MAP < 60

CRITICAL: If unresponsive and ineffective ventilations with a pulse:

2. Suction prn; PPV using BLS airways and BVM | Abdominal thrusts contraindicated
   Pts usually respond after PPV; consider ADV Airway if pt. unresponsive to PPV

CRITICAL: If unresponsive, apneic, and pulseless:

2. CPR using traditional A-B-C approach as soon as removed from water | Rx per Cardiac Arrest SOP
   - Suction prn: Vomiting is common in those who require compressions & ventilations
   - Remove wet clothing / dry pt. ASAP – especially the chest before applying pads and defibrillating
   - If pt is cold: refer to HYPOTHERMIA SOP
3. Evaluate for ↑ ICP: (↑ SBP, widened PP; ↓ pulse, abnormal respiratory pattern, gaze palsies, HA, vomiting)
   If present; Rx per **Head Trauma SOP**
4. **Enroute**: Complete ITC: IV NS TKO [ALS]

SCUBA | Diving-related emergencies: Consider **decompression illness** if any of these S&S present even if an apparently safe dive according to the tables or computer

Serious Neurological: Dysfunction involving bladder, bowel, gait, or coordination (ataxia), reflexes, mental status (dysphasia, mood, memory, orientation, personality), vision, hearing (tinnitus), consciousness, strength, vertigo
Cardiopulmonary: Cough, hemoptysis, dyspnea, voice change
Mild Neurological: Paresthesia, numbness, tingling, altered sensation
Pain: Ache, cramps, discomfort, joint pain, pressure, spasm, stiffness
Lymphatic or Skin: Edema, itching, rash, burning sensation, marbling
Constitutional/Nonspecific: Dizziness, fatigue, HA, N /V, chills, diaphoresis, malaise, restlessness.

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

High Altitude Travel and Altitude Illness: See https://wwwnc.cdc.gov/travel/yellowbook/2020/noninfectious-health-risks/high-altitude-travel-and-altitude-illness

Environmental: HEAT EMERGENCIES (Adult & Peds)

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 | 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** in consecutive 200 mL increments (peds 10 mL/kg) to maintain SBP ≥ 90 (MAP ≥ 65) or normal for age
   - 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 bG for hypoglycemia
   - **If SBP 110 / normal for age / 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 challenges in 200 mL increments (peds 10 mL/kg) up to 1 L to maintain SBP ≥ 90 (MAP ≥ 65) or normal for age unless contraindicated | Caution: Patient at risk for pulmonary and cerebral edema
   - Monitor ECG
2. Move to a cool environment | **Initiate rapid cooling** (avoid shivering):
   - 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 standard dose for seizures (adult and peds)

Medications/substances that predispose to heat emergencies:

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

GLUCOSE | DIABETIC Emergencies

1. **IMC** special considerations:
   - PMH; type of diabetes; presence of automated insulin delivery (AID) systems; glucose monitoring devices
   - Determine general compliance; time and last doses of medications prescribed for DM mgt and last oral intake
   - Obtain/record **blood glucose** (bG) level on all pts with S&S of hypo or hyperglycemia, AMS or neuro deficits

     Reference ranges: Neonates > 3 days to adults: Fasting: 70-99 mg/dL Non-fasting: 70-139 mg/dL

S&S Hypoglycemia	
Mild:	Pallor; diaphoresis; shakiness; weakness, fatigue; hunger, anxiety, nervousness, irritability, difficulty concentrating; HA; dizziness; numbness, tingling around mouth and lips; nausea, rapid HR, palpitations
Moderate	Irritability, agitation, confusion; ataxia; motor weakness; difficulty speaking or slurred speech; elderly patients may present with S&S of a stroke
Severe	Lethargy, confusion to coma; seizures; inability to swallow; cold limbs / hypothermia

Blood glucose ≤ 70 or S & S of hypoglycemia

Hypoglycemic patients with AMS are considered nondecisional. When hypoglycemia is corrected and confirmed by a repeat bG reading, they can be re-assessed for ability to refuse care.

2. **If GCS 14-15 and able to swallow safely** (+ gag reflex**): up to 15 g** of a rapidly-absorbed **oral carbohydrate** if available [BLS] | May repeat in 15 minutes. Options include (not limited to) any one of the following:
   - Glucose tablets (5 g per tablet) | Glucose gel (15 g per tube)
   - Sweetened fruit juice: 12 g carbs / 4 oz (120 mL) | Regular soda (not diet): 18 g carbs / per 6 oz (180 mL)
   - Honey: 17 g carbs / 1 T (15 mL) | Granulated sugar: 12.5 g sugar / 1 T
3. **IF AMS & cannot swallow safely | bG borderline 60-70:**

   DEXTROSE 10% (25 g/250 mL) IVPB rapidly (wide open) – infuse up to **12.5 g** (**125 mL** or ½ IV bag)

   If bG < 60 (no S&S pulmonary edema – if lungs congested see cautions in appendix):

   DEXTROSE 10% (25 g/250 mL) IVPB rapidly (wide open) – infuse up to **25 grams (entire 250 mL)**

   If S&S of hypoglycemia fully reverse and pt becomes decisional after a partial dose, reassess bG
   If > 70; close clamp to D10% and open NS TKO

   Approved alternative if D10% unavailable: **D50%** (25 g/50 mL): See drug appendix
4. **Assess patient response 5 minutes after dextrose administration**: Mental status (GCS) and bG level

   If ≥ 70: Ongoing assessment
   If < 70: Repeat D10% in 5 g (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 IN/IM** [BLS]
6. If decisional pt refuses transport after bG normalized: Advise pt to eat & call PCP before EMS leaves 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 **dehydration + 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

Diabetic ketoacidosis (DKA) presents with **all 3:** More common in pts with T1D

Hyperosmolar hyperglycemic nonketotic syndrome (**HHNS**):
More common with T2D | Very high bG levels + severe dehydration, but NO acidosis or ketosis

2. **IMC** special considerations: EMS shall not assist any patient in administering insulin
   - 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 or CKD
     Attempt to maintain SBP ≥ 90 (MAP ≥ 65); monitor for development of cerebral and pulmonary edema

HYPERTENSION

- Hypertensive emergencies include a spectrum of presentations in which uncontrolled high BPs lead to progressive or impending end-organ dysfunction.
- Hypertensive **urgencies** and **emergencies** both have **BP elevations** (SBP > 160) | Only hypertensive **emergencies have life-threatening end-organ damage** that requires rapid antihypertensive medications

S&S:

- **Hypertensive urgency**: Headache, epistaxis, faintness, and psychomotor agitation
- **Hypertensive emergency**: Above + Causes and S&S suggesting end-organ dysfunction
  - **Neurologic damage** due to hypertensive encephalopathy, stroke, SAH or intracranial hemorrhage Assess for headache, visual disturbances, seizures, AMS, weakness/paralysis
  - **Cardiovascular damage** due to myocardial ischemia/infarction; LV dysfunction, acute pulmonary edema; or aortic dissection: Assess for chest pain, dyspnea, JVD; back pain; pulse deficits between limbs
  - **Other organ system dysfunction** may lead to acute renal failure, retinopathy, or **eclampsia**
  - Assess for seizures, peaked T waves, and hematuria
  - **Ask about drug use** (cocaine/methamphetamine); assess for S&S of delirium w/ extreme agitation

1. **IMC** special considerations: **Rx the patient, not the number |** Use correct BP cuff size & technique
   - Assess BP in **supine and sitting** positions unless contraindicated (✓ for volume depletion)
   - Assess BP in **both arms**: a significant difference may suggest aortic dissection
   - Maintain head and neck in neutral alignment; do not flex neck or knees
   - Assess and record **baseline 12 L ECG, GCS, and neuro signs**; repeat q. 15 min or if changes occur
   - Assess for Hx of trauma, HTN, CVD, ACS, aortic aneurysm, CKD, DM, pregnancy, or adrenal tumor

HYPERTENSIVE URGENCY

No evidence of end organ damage or focal neurologic deficits

2. Transport without drug therapy to reduce BP
3. If severe headache: **Adult: FENTANYL or ACETAMINOPHEN** standard dose per PAIN Mgt SOP

HYPERTENSIVE EMERGENCY (SBP > 160) plus

Non-traumatic origin; evidence suggesting **end-organ dysfunction present**

Time sensitive pt

DO NOT use drug therapy solely to rapidly lower BP in chronically hypertensive pts: Needs IV BP control at hospital

2. **IMC** special considerations:
   - Assess **stroke scale. If positive for stroke ➔ Stroke SOP**
   - Keep patient as quiet as possible; reduce environmental stimuli
   - If GCS ≤ 8: Assess need for ADV airway
   - Elevate head of stretcher 10˚-15˚
   - 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** per ACS SOP [BLS] | Contact OLMC for repeat dose
4. **If generalized tonic/clonic seizure activity:**
   - **Not pregnant: MIDAZOLAM** standard dose for seizures
   - **Pregnant: MAGNESIUM SULFATE** per Eclampsia SOP
5. Continue treating per appropriate SOP based on etiology and clinical S&S

PSYCHIATRIC | Behavioral Health Emergencies (BHE):
Decisional capacity | Risk assessment | Care (Adult & Peds)

May be critical

SCENE SAFETY: If safety in jeopardy, request law enforcement protection; withdraw until scene is safe for EMS.

- Assess for imminent risk of harm to self or others: **verbal; non-verbal, or written threats/threatening behavior** (shaking fists, intentionally slamming doors, punching walls, destroying property, vandalism, sabotage, theft, or throwing objects), self-injurious behaviors, disordered eating, **physical attacks** (hitting, shoving, biting, pushing or kicking). Extremes include rape, arson, and use of lethal force).
- Inspect environment for clues suggesting substance use; suicide notes, plans to harm others
- **General pt appearance**; hygiene, grooming, odors | Inspect for Medic alert jewelry; impairment; trauma
- **Collateral information from informants**: History (if known) and recent mood, behavior, or thought changes
- **Consider use of the Richmond Agitation Sedation Scale (RASS)** – See bottom of 3rd page BHE SOP

DECISIONAL CAPACITY / RISK ASSESSMENT

Ability to understand and appreciate the nature and consequences of a decision re: medical Rx or foregoing life-sustaining treatment and the ability to reach and communicate an informed decision (755 ILCS 40/10 [1996], as amended by P.A. 90-246). **Capacity can be influenced by** medications, pain, time of day, mood, medical or mental illness. If any S&S below are abnormal/impaired the pt may lack capacity Attempt to assess if changes are new (acute) or features of chronic dx and how grossly abnormal EMS interprets the exam findings to be.

Has pt been declared an emancipated minor? ☐ Yes ☐ No	Has pt been declared legally incompetent? ☐ Yes ☐ No

Alertness (Abn. GCS 13 or less): E (3 or 4 OK): V (5): M (6) Total:

Orientation X 4: Answers accurately person, place, time, and situation (Abn. X 3 or less / 4)

Speech: Speaks with normal rate, volume, articulation, content | (Disorganized, repetitive utterances?)

Affect: Mood/emotional response (sad, depressed, flat, anxious, irritable, angry, elated, inappropriate, and incongruent with speech content)

Behavior: Posture, gestures, abnormal movements, repetitive behaviors; is pt. quiet, restless, inattentive, hyperactive, agitated, violent? Is pt cooperative and able to remain in control?

Cognition: Intellectual ability/thought processes - Note if linear, confused, disorganized, obsessive thoughts, not making sense; evidence of delusions, delirium, dementia, hallucinations, phobias, suicidal or homicidal ideations.

Memory: Immediate, recent, remote (amnesia/dementia?)

Insight: Can pt articulate lucid and logical implications of the situation and consequences to their choices? Do they understand relevant information? Can they draw reasonable conclusions based on facts and communicate a safe and rational alternative choice to recommended care?

Assess for and Rx causes of AMS per symptom-specific SOP (Consider baseline/normal ranges for pt)

BALANCE/Coordination – Ataxia (upper or lower extremities); tremors | EYES: Nystagmus

HPI/ PMH Look for medical causes

- Denies PMH or unable to obtain PMH
- **A**: **Alcohol/drugs/toxins (substance use);** ACS/HF, arrhythmias, anticoagulation, anemia
- **E**: Endocrine/exocrine, particularly thyroid/liver/renal/adrenal dx; electrolyte/fluid imbalances; **ECG**: dysrhythmias/prolonged QT
- **I**: Insulin disorders: ✓**glucose for hypo or hyperglycemia** (DKA/HHNS)
- **O**: O_2 deficit (**hypoxia – ✓ SpO_2**), **opioids/OD,** occult blood loss (GI/GU)
- **U**: Uremia; other renal causes including hypertensive problems
- **T**: (recent) Trauma, temperature changes (hypo-hyperthermia)
- **I**: Infections, neurologic and systemic (**sepsis**)
- **P**: Psychological*; poisoning; perfusion deficits; massive pulmonary embolism
- **S**: Space occupying lesions (epi or subdural, SAH, tumors); stroke, shock **(hypotension),** seizures

Neuro: Delirium, dementia (Alzheimer's dx), developmental impairment, autism, Parkinson's dx; migraine/other HA
Metabolic: Acidosis (**✓ $EtCO_2$**), vitamin/dietary deficiencies; disordered eating / malignancies
***Psych/behavioral:** Anxiety or mood disorders; PTS, mental health crisis; personality and bipolar disorders; delusions, psychosis; hallucinations (auditory, visual, tactile)

Risk

Determine decisional capacity + mental health safety risk

- ☐ **Low risk:** Flat affect; low suicide risk; thoughts disordered (confused) with insight, cooperative
- ☐ **Medium risk**: Intoxicated, disinhibited, no insight, unpredictable, cooperative
- ☐ **High risk:** Violent; agitated; aggressive, uncooperative; no insight | high risk to self/others

C A R E

IMC special considerations | **MEDICAL care = MEDICAL decision** | Work collaboratively w/ mental health / LEO personnel

1. **Priority: PT & PERSONNEL SAFETY** | Recognize warning signs | **Use least risk/force possible** to protect all from injury; facilitate assessment | Rx life-threats; and/or safely transport.
   Do not antagonize | Maintain dignity to extent possible | Maintain safe distance unless urgent interventions indicated
   Inform pt of intent to touch them for an assessment or safety hold | PPE/source control | consider early O_2

PSYCH | BHE Care cont.| Sedation | Restraint | Suicide screen

May be critical

CARE

2. Provide low stimulus & calm environment; limit responders to minimum safe levels, isolate from bystanders prn
3. **Empathetic communication |** Use concise, simple words | Set boundaries and clear limits (mutual respect)
4. If pt lacks decisional capacity | poses medium-high risk to self or others: **DO NOT LEAVE ALONE**
   Provide **continuous visual observation** and ability to intervene immediately | **Rx per implied consent**
5. **If S&S of anxiety | verbal aggression and confrontation | Cooperative | Low-medium safety risk:**
   - **Verbally redirect and de-escalate** when possible with coaching & reassurance
   - Unsuccessful: If BP (MAP) normal for pt/age: **MIDAZOLAM** (anxiety/sedation dose)
     If suspect use of alcohol, opioids, or CNS depressants: reduce MIDAZOLAM total dose to 0.1 mg/kg
5. **If physical aggression/violent | severe agitation | UNcooperative | High safety risk to self or others:**
   - Inform pt that violence or abuse cannot be tolerated | Take all threats seriously
   - **Verbal de-escalation** | Use barriers for protection | Self-defense when appropriate
   - If unsuccessful & unsafe: **KETAMINE** (Sedation dose): Estimate pt wt carefully | Caution if active psychosis
   - **RESTRAINT** (Physical hold/mechanical restraints per protocol)**: Humane, judicious & safe**
     - **Indications:** Pt poses imminent risk of harm to self, others, or environment
     - Must not be punitive | Position to maximize airway/ventilations & minimize aspiration risk
     - Ensure peripheral perfusion distal to restraint | Allow for rapid removal if ABCs compromised
     - **Avoid injury** | Never use prone, hogtie (hobble) positioning nor place under backboard or mattress
     - Cardiac arrest can happen quickly | Watch for sudden giving up, quiet compliance, collapse
     - In an emergency: apply restraints; then confirm necessity with OLMC | Document thoroughly
     - If applicable: Describe how restraint was applied by others and EMS assessment of pt safety

   Cont. monitoring/frequently reassess: GCS, RASS, airway, VS; SpO_2; $EtCO_2$; WOB; ECG; at least q. 5 min
   Document untoward events after sedation or restraint | Watch for complications of delirium w/ severe agitation
6. Provide pre-arrival notification & report ASAP

Suicide Screen: Explore **risk of suicide/harm to others** (current, recent, or lifetime SI attempts); warning signs/behavior changes; mitigating/protective factors/support systems. Bring suicide notes to hospital.

Possible RISK FACTORS for suicide

- Mental health or illness disorders (esp. depression and bipolar disorder)
- Previous suicide attempts or self-inflicted injury | Access to lethal means coupled with suicidal thoughts
- Hx of trauma, loss, marginalizing experiences (adverse childhood experiences; family history of suicide, bereavement, or economic loss); discrimination based on socioeconomic factors, race/ethnicity or gender/sexual identity
- Serious illness, or physical or chronic pain or impairment; substance use
- Social isolation; barriers to healthcare; pattern/history of aggressive or antisocial behavior; family or peer conflict
- Discharge from inpatient psychiatric care, particularly within first weeks and months after discharge

Always ask questions #1 & #2	In past month
1. **Wish to be dead**: Have you wished you were dead or wished you could go to sleep and not wake up?	
2. **Suicidal thoughts:** Have you actually had any thoughts about killing yourself?	
If YES to #2, answer questions 3, 4, 5 & 6 **If NO to #2,** go directly to question 6	
3. **Suicidal thoughts w/ method** (no plan or intent to act): Have you thought about how you might do this?	
4. **Suicidal intent, no specific plan:** Have you had any intention of acting on these thoughts of killing yourself, as opposed to you have the thoughts but you definitely would not act on them?	
5. **Suicidal intent with plan:** Have you started to work out or have worked out the details of how to kill yourself? Do you intend to carry out this plan?	
ALWAYS ASK QUESTION #6	In past 3 mos.
6. Have you done anything, started to do anything, or prepared to do anything to end your life? Ex: Collected pills, obtained a gun, gave away valuables, wrote a will or suicide note, held a gun but changed your mind, cut yourself, tried to hang yourself, etc.	

Any YES must be taken seriously. If YES to #4, #5 or #6, immediately transport to appropriate HC facility.
Check pts and bystanders for items that could be used to make a suicide attempt or harm others. Observe for hanging anchor points and minimize use of items that can be used for self-injury: bandages, sheets, plastic bags, IV & O_2 tubing.

National Suicide Prevention Lifeline: Call 988 | Veterans: 1-800-273-8255; press 1 for live chat or text 838255

PSYCH | BHE cont.: Documentation | Contested collaborative care decisions
Transport without consent | Agitation scoring tool

May be critical

Documentation in addition to usual history and exam *(ImageTrend worksheet)*

- Who called EMS? What happened?
- Where/when did event happen?
- Preceding factors (prior events)
- Decisional capacity/risk assessment findings
- Suicide screen (if applicable)
- Interventions (type and nature)/responses
- Any challenges encountered during the call
- Pt's access to lethal means of harm
- Types of threat alleged or observed: verbal or physical (nature)
- Witnesses; others involved; account of situation/statements by pt
- Verify injuries sustained: emotional/physical
- Evidence to support risk assessment (notes/social media posts)
- Scene factors/observations to support risk concerns
- Pt's stated preferences regarding Rx if different from EMS
- LEO/mental healthcare worker presence/engagement
- Patient disposition

BHE pts may not dissent to care/transport if:

- EMS has access to the pt + they lack legal or decisional capacity; and/or
- Pt poses an imminent risk to self (suicide/self-injurious behaviors), others, or meets self-neglect emergency criteria (see SOP Introduction); and/or
- Remains acutely & severely hemodynamically unstable/ in physiologic distress with AMS after care.

If any of the above are present - transport under implied consent

Caveats on contested collaborative care decisions/EMS safety issues

- Non-medical persons cannot compel EMS practitioners to provide or withhold any EMS care.
- EMS personnel have no duty to place themselves at risk of bodily harm in the absence of law enforcement assistance and protection.
- OLMC cannot compel EMS to act in a way that subjects them to risk of harm – which may mean leaving a high-risk patient at the scene when EMS access has been denied, LEOs decline to assist, and/or there is reason to believe the pt may have access to lethal weapons.

EMS shall not seek OLMC approval of a refusal if the above applies. Rather, they shall report the following:
We are on scene with a person who has denied us access to provide a reasonable assessment and law enforcement has declined to intervene. [OR] We have determined that this person has legal and decisional capacity and they appear to pose no imminent risk to self or others and decline to be transported at the present time. They have been informed of the benefits of Rx/transport, given disclosure of the risks of dissenting, alternatives for care, and they demonstrate appropriate insight. They persist in declining our assistance. We are therefore leaving them in their current environment.

Disposition			
☐ Treat/transport w/ express consent	☐ Treat/transport w/ implied consent	☐ Decisional pt refused care/transport	☐ No care d/t EMS safety concerns

Modified Richmond Agitation Sedation Scale (RASS)

Used for Behavioral Health Emergency patients prior to / during / after sedation

Score	Responsiveness	Speech
+4	Combative, violent, out of control	Continual loud outbursts or growling
+3	Very anxious and agitated	Loud outbursts
+2	Agitated, overstimulated but self-controlled	Fast speech; flight of ideas
+1	Anxious or restless	Normal, talkative
0	Awake, alert, calm, cooperative	Normal
-1	Drowsy, asleep, rouses to voice	Slurring or slowing
-2	Light sedation; rouses to physical stimulation	Marked slowing; few recognizable words
-3	Moderate sedation; responds to pressure stimulus	Words or no speech
-4	Deep sedation; no response to stimulus – hold further med	No speech

Complications of delirium w/ severe agitation: Stroke, STEMI, hypoglycemia, hyperthermia, rhabdomyolysis, trauma

STROKE | TRANSIENT ISCHEMIC ATTACK

Time sensitive pt

1. **IMC** special considerations:
   - History of present illness/PMH | Complete **BEFAST** **STROKE SCREEN + LVO assessments** – See next page
     Attempt to determine baseline status: dementia, pre-existing limitations/deficits, unable to care for self?
   - Support ABCs as needed; O_2 if SpO_2 < 94% or O_2 sat unknown; avoid hypoxia and hyperoxia
   - Seizure/vomiting precautions; suction prn
   - Maintain head/neck in neutral alignment; do not use pillows. If SBP > 100: Elevate head of bed 10° - 15°
   - Monitor ECG; acquire 12 L if possible
   - **IV: 18 g AC**. (Max 2 attempts); avoid excess fluid loading.
   - Repeat VS frequently & after each intervention. Anticipate HTN & bradycardia due to ↑ ICP.
     Do NOT Rx HTN 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 Seizure SOP
   MIDAZOLAM standard dose for seizures
3. **If AMS, seizure activity, or neurologic deficit**: Assess **blood glucose**
   If ≤ 70 or S & S of hypoglycemia: Treat per Glucose Emergencies SOP
4. **Minimize scene time** (<15 min - AHA) - transport to the nearest PSC/CSC per Stroke Checklist next page
5. **Call Stroke Alert to OLMC ASAP** if Positive **BEFAST** screen, large vessel occlusion (**LVO**) cortical signs, or other assessments are positive (see next page)

Characteristics of stroke	Thrombosis	Embolism	Intracerebral Hemorrhage	SAH
Prodromal warning	Common	No	No	Rare
Onset during sleep	Sometimes	Rare	Rare	Rare
Development	Gradual	Sudden	Gradual or sudden	Sudden
Decreased consciousness	Mild	Mild	Severe	Moderate
Headache	Mild	Mild	Severe	Severe
Hypertension	Common	Possible	Not always	Common
Nuchal rigidity	No	No	Sometimes	Yes
Vomiting	Rare	Rare	Sometimes	Sometimes

Brainstem or posterior stroke

- **5 Ds**: **D**izziness, **D**iplopia, **D**ysarthria, **D**ysphagia (chewing & swallowing), **D**ystaxia (incoordination)
- Acute vestibular syndrome: Vertigo; N/V; head motion intolerance; ataxia; bidirectional nystagmus (at rest or lateral gaze)
- Visual field loss; **gaze palsies;** partial or complete loss of hearing
- Hallmark: Crossed findings; same side (ipsilateral) cranial nerve deficits
- Motor/sensory deficits (contralateral); decreased pain and temp sensation; loss of 2 point discrimination

Stroke mimics	
Etiology	**History and Exam Findings**
Psychogenic	Lack of objective CN findings, neuro findings in nonvascular distribution, inconsistent exam
Seizures	Hx of seizures, witnessed seizure activity, postictal period
Hypoglycemia	Hx DM, low serum glucose, ↓ LOC
Infection	Bell's palsy: Complete hemiparesis of face; can't wrinkle forehead on affected side
Complicated migraine/with aura	Hx similar events, preceding aura, headache
Hypertensive encephalopathy	Headache, delirium, significant HTN, cortical blindness, cerebral edema, seizure
Wernicke's encephalopathy	Hx alcohol abuse, ataxia, EOM paralysis, confusion
CNS abscess	Hx drug abuse, endocarditis, medical device implant w/ fever
CNS tumor	Gradual progression of symptoms, other primary malignancy, seizure at onset
Drug toxicity	Med Hx includes Lithium, phenytoin, carbamazepine

EMS STROKE SCREEN/STROKE ALERT CHECKLIST

Pt. name		DOB		Gender	
Witness name		Call back number:			
Chief complaint					

Severe headache or seizure at onset? ☐ Y ☐ N Head trauma at onset? ☐ Y ☐ N

EXAM – NEW ONSET focal neurological deficit S&S - - Complete ENTIRE Stroke Screen		✓ IF ABNORMAL	
B	**BALANCE**/Coordination – Unsteady, fall? Finger to nose, rapid alternating movements, heel to shin. Note ataxia; tilting to one side, vertigo (timing/ trigger)	R	L
E	**EYES**: Vision changes: blurred, diplopia, loss of visual field | bidirectional nystagmus | Eye position: Ptosis / Horizontal **gaze deviation**	R	L
F	**FACE:** Smile/*grimace*, show teeth; close eyelids, wrinkle forehead Note unilateral weakness/asymmetry:	R	L
A	Motor – **ARM** (close eyes and; hold out both arms (palms up) for 10 sec) Normal; Abnormal: drift to no effort against gravity	R	L
S	**SPEECH** (Repeat "You can't teach an old dog new tricks" or sing Happy Birthday ☐ **Expressive/receptive/global aphasia** ☐ Word substitution/retrieval deficits ☐ Dysarthria	☐ Normal ☐ Abnormal	
T	**TIME last known normal(LKN) for pt baseline** w/o new S&S ☐ ≤ 24 hrs ☐ > 24 hrs	Time:	
	Time of S&S discovery: Earliest time pt known to have new S&S	Time:	
Other	**Level of consciousness**: AMS? GCS: E V M	Total GCS:	
	Orientation: Answers accurately: Name, age, month of year; location, situation	X (1-4)	
	Responds to commands: open/close eyes	Y	N
	Gross hearing – Note new onset unilateral hearing deficit; sound sensitivity	R	L
	Say "Ah", palate rises, uvula midline; Stick out tongue: remains midline (note abnormalities)	R	L
	Agnosia: Inability to recognize an object (part of body) or person **Neglect:** One sided extinction (visual, auditory, sensory)	R	L
	Motor: Lift leg. Normal | Abnormal: drift to no effort against gravity	R	L
	Sensory: Focal changes/deficits (face, arms, legs); paresthesias, numbness	R	L
	ANS: Sweating only one side	R	L
	Neck stiffness (cannot touch chin to chest; vomiting	Y	N
	Blood glucose level - List reading:	Y	N

PMH

☐ None ☐ A-Fib/Flutter ☐ AVM, tumor, aneurysm ☐ Bleeding disorders ☐ CAD/Prior MI/Heart/vascular dx
☐ Carotid stenosis ☐ Pregnant (or up to 6 wks. post- partum) ☐ Depression ☐ Diabetes ☐ Drug/Alcohol Abuse
☐ Dyslipidemia ☐ Family Hx stroke ☐ HF ☐ Hormone RT ☐ HTN ☐ Migraine
☐ Obesity ☐ Previous stroke ☐ Previous TIA: ☐ Previous intracranial surgery/bleed ☐ Serious head trauma
☐ *Prosthetic valve ☐ PVD ☐ Renal failure ☐ Sleep apnea ☐ Smoker/tobacco use

MEDS

Anticoagulant use in 48 hrs: ☐ warfarin/Coumadin/Jantoven ☐ apixaban/Eliquis ☐ argatroban
☐ dabigatran/Pradaxa ☐ desirudin/Privask ☐ edoxaban/Savaysa ☐ enoxaparin/Lovenox
☐ fondaparinux/Arixtra ☐ LMW heparin ☐ lepirudin/Refludan ☐ rivaroxaban/Xarelto
Platelet inhibitors: ☐ ASA ☐ clopidogrel/Plavix ☐ dipyridamole/Aggrenox
☐ prasugel/Effient ☐ ticagrelor/Brilinta ☐ ticlodipine/Ticlid
☐ Cocaine/other vasoconstrictors (amphetamines: PCP)

Destination options if primary impression is stroke:

☐ Nearest hospital:	Patient unstable
☐ **Nearest SC** (Primary or Comp.)	BEFAST +/ LVO not suspected OR LKN > 24 hours | Transport time to CSC > 30 min
☐ Nearest **Comprehensive** SC	LVO cortical signs | SAH/ICH suspected + LKN ≤ 24 hours + Transport time ≤ 30 min

Stroke alert called to (OLMC hospital)		Time:
Receiving hospital		

Comprehensive SCs (Thrombectomy up to 24 hrs after onset S&S) ☐ ABMC ☐ LGH ☐ NCH ☐ RES ☐ CDH/MSU

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 SUD; time last used

Consider possible etiologies:

- Anoxia/hypoxia
- Cerebral palsy or other disabilities
- Eclampsia
- Stroke/cerebral hemorrhage
- Trauma/Abuse
- Anticonvulsant withdrawal/noncompliance
- Infection (fever, meningitis, encephalitis)
- Metabolic (glucose, electrolyte disorders, acidosis)
- Toxins/intoxication/SUD; OD | Withdrawal; DTs
- Tumor | ↑ ICP

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**:
   Benzodiazepine administration takes precedence over bG determination in pts who are actively seizing

   MIDAZOLAM 2 mg increments slow IVP **q. 30-60 sec** (0.2 mg/kg IN) **up to 10 mg IVP/IN** titrated to stop seizure
   - If IV/IO unable/IN contraindicated: **5-10 mg** (0.1-0.2 mg/kg) **IM** (single dose)
   - All routes: May repeat to a Max total dose of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated
   - If hypovolemic, elderly, debilitated, chronic Dx (HF/COPD); on opioids/CNS depressants: ↓ total dose to 0.1 mg/kg

   If pregnant with possible eclampsia: Rx with **MAGNESIUM SULFATE** per Eclampsia SOP
3. **Identify and attempt to correct reversible precipitating causes** (see above)
   Assess/record **blood glucose** I If ≤ 70 or S&S of hypoglycemia: Treat per Glucose Emergencies SOP

SEPSIS and SEPTIC SHOCK

Time sensitive pt

1. **IMC special considerations:**
   - Rapidly assess for risk factors | S&S suggesting infection* | Infectious source - IF YES
   - **SpO_2**: Use central sensor if pt has poor peripheral perfusion (cold hands)
   - Assess **$EtCO_2$** - Correlations
     $EtCO_2$ ≤ 31 = Lactate 2 | Suggests hyperventilation; poor perfusion; and/or metabolic acidosis
     $EtCO_2$ < 25 = Lactate ≥ 4 (metabolic distress)
   - Assess **qSOFA:** Quick Sequential [Sepsis-related] Organ Failure Assessment **criteria**
     - AMS (**GCS < 15**); assess for disorientation/agitation and/or GCS 1 or more points below patient's baseline
     - **RR ≥ 22** (adult) **SBP ≤ 100** (adult) (note if **≥ 2 criteria are present**)
   - Trend pulse pressures (PP) (normal 30-50) + **MAP** (normal 70-110) q. 5 min
     Can crash rapidly | Elderly & those with HTN cannot tolerate hypotension for even a short time
   - **Assess S&S of fluid depletion:** Orthostatic VS changes if not hypotensive**;** poor skin turgor, dry mucosa
     Vascular access: 18 g AC preferred if inopressor needed **| IVF-** See below
   - **Assess blood glucose:** Anticipate hyperglycemia and electrolyte abnormalities

Warm stage	(6-24 hrs): ↑ RR; hyperdynamic phase with high cardiac output; SBP 25% < normal; fever, vasodilation, skin: hot, dry, flushed
Cold Stage	(ominous/late): AMS; T< 96.8° F; skin cold; mottling; ↑ HR & RR; profound hypotension

***Indicators suggesting infection:**

Fever; warm skin	Fatigue, altered mental status	Cough, dyspnea	Sore throat, ear ache
Diarrhea	Dysuria, foul smelling/cloudy urine	Local redness, warmth, swelling, unhealed wounds etc.	

If infection, no sepsis: Cardio-resp. support | Rx specific conditions per appropriate SOP or OLMC

SEPSIS: Suspect infection + $EtCO_2$ ≤ 31 + ≥ 2 qSOFA criteria: (SBP 90-100 | MAP > 65)

2. Call OLMC with a **Sepsis alert** per local policy/procedure
3. NS 200 mL boluses to achieve SBP ≥ 100 mmHg (max 1 L)

SEPTIC SHOCK: Sepsis + **SBP < 90 (MAP < 65)** or hypotensive for pt (40 mmHg < baseline); or **$EtCO_2$ ≤ 25**

2. Call OLMC with a **Sepsis alert** per local policy/procedure.
3. IV/IO **NS 200 mL boluses** in rapid succession (max: 20 mL/kg) to SBP ≥ 90 (MAP ≥ 65)
   Reassess VS / skin signs / $EtCO_2$ after each bolus to assess for fluid responsiveness and S&S of volume overload
4. **If hypotension persists after 500 mL IVF – add inopressor while continuing IVF** (2nd IV line needed)
   NOREPINEPHRINE drip IV (lg. vein) / IO: Conc: 4 mg in 1,000 mL NS (4 mcg/mL) | Use of IV pump preferred
   Initial dose: 8 mcg/min (2 mL/min) titrated to SBP ≥ 90 (MAP ≥ 65)
   Higher doses (10 mcg/min) RARELY needed – contact OLMC. Assess BP (MAP) q. 2 min until target BP reached (don't overshoot) | Then reduce dose (drip rate) incrementally just to maintain at BP targets.
   Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) or less | Continue to reassess BP q. 5 min.

At risk populations: ≥ 65 or < 1 yr, or weakened immune systems (cancer, HIV/AIDS); indwelling devices; chronic steroid use; sickle cell disease, splenectomy; bedridden or immobile); recent trauma, surgery, or dental work; breached skin integrity (wounds, burns); IV drug use; females - recent birth, miscarriage, abortion; PID, post-organ transplant; chronic disease: DM, cirrhosis, autoimmune, renal

Results in a systemic immune/**inflammatory response leading to massive vasodilation and capillary leak** that causes hypoperfusion | Other concerns: **Hypercoagulability** (petechiae); mottling

May be sicker than they look – Consider shock index; tissue hypoxia and acidosis begin BEFORE ↓ BP

SHOCK Differential | Hypovolemic

Time sensitive pt

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

Classic stages of hemorrhagic shock (ATLS) are of limited clinical relevance in real pts, because of: differences in compensation for various types of injuries (blunt vs. penetrating) | Age: Children have large reserve capacity; elderly: diminished reserve capacity & may be unable to mount tachycardic response; if HTN, may present "normotensive" Comorbidities; Medications (beta / calcium blockers; digoxin) may conceal shock by preventing tachycardia

1. **ITC special considerations:**
   - Hemorrhage control 1st priority per ITC SOP
   - Use central sensor for SpO_2 if pt has poor peripheral perfusion (cold hands)
   - **Trend serial $EtCO_2$** readings; low levels (< 31) suggest hyperventilation; poor perfusion to lungs; and/or 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 & warm IVF** per ITC SOP
2. Assess and treat specific injuries per appropriate SOP

Etiology	Origin	BP	HR	Skin	Lungs	$EtCO_2$	EMS Treatment
Cardiogenic	Pump failure	↓	↓ or ↑	Pale, cool, moist	Crackles or wheezes	↓ (hyperventilation, metabolic acidosis	Inopressor
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, inopressor
Septic			↑	Hot, dry, flushed or pale, cold mottling	Crackles/wheezes if pulmonary origin	↓ (hyperventilation, metabolic acidosis	IVF, inopressor
Anaphylactic			↑	Flushed/moist, hives, rash	May have wheezes, ↓, or no sounds	↑ w hypoventilation & ventilatory failure	IVF, epinephrine, albuterol, ipratropium; diphenhydramine

See specific SOPs for: Anaphylactic shock Cardiogenic shock (HF) Neurogenic shock (SCI)

Obstructive shock: Cardiac tamponade & Tension pneumothorax (impaired filling right heart) (see Chest Trauma) ; and massive Pulmonary Embolism (impaired filling left heart) (See Acute Respiratory Disorders)

INITIAL TRAUMA CARE (ITC)

Evidence-based mgt. of significant trauma requires understanding of kinematics; accurate assessment of event & patient; interpretation of physical findings & rate of change; and transport to appropriate definitive care in a timely manner.

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

- **Scene safety**: Control/correct hazards/threats | Form plan of approach; remove pt / responders from unsafe environment ASAP | Attempt to preserve integrity of possible crime scene evidence
- MOI: Anticipate type / severity | Universal precautions; use appropriate PPE
- **Triage**: # & general acuity of pts. | Request additional resources prn | Weigh risk of waiting for resources against benefit of rapid transport | Consider if MPI declaration is needed
- Bring essential resources to pt: Hemorrhage control; airway & O_2; spine splinting; vascular access/IVF; pain mgt

PRIMARY ASSESSMENT: MARCH (Massive hemorrhage, Airway, Respiratory/breathing, Circulation, Head injury/ Hypothermia)

1. **General impression:** ~Age, gender; wt.; general appearance, position / surroundings; obvious injuries/bleeding, purposeful movements
2. **Determine if immediate life threat exists |** Resuscitate as found
3. **Level of consciousness:** AVPU or GCS; chief complaint S&S
4. **AIRWAY/SPINE:** Snoring, gurgling, stridor, silence. Consider possible spine injury
   - **Open/maintain** using position, suction, appropriate adjuncts, & manual spine motion restriction prn
   - Once airway controlled: Apply appropriate size c-collar + standard spine motion restriction if indicated
   - Vomiting/seizure precautions as indicated
5. **BREATHING/adequacy of ventilations and gas exchange:**
   - Spontaneous; 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, CR 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% (88-92% COPD) unless hyperoxia contraindicated
   - O_2 1-6 L/NC: Adequate rate/depth; minimal distress; SpO_2 92%-93% (88%-92% COPD)
   - O_2 12-15 L/NRM: Adequate rate/depth: mod/severe distress; SpO_2 <92%; (<88% COPD)
   - O_2 15 L/ BVM: Apnea | Shallow/inadequate rate/depth with mod/severe distress
     Adults: PPV 1 breath q. 6 sec (10 breaths/minute) (Asthma: 6-8 BPM)
   - **CPAP:** Per SOP | **Life-threats**: If tension or open pneumothorax; flail chest →**Chest Trauma SOP**
6. **CIRCULATION/perfusion**: **(1st priority if massive hemorrhage)**

   Compare radial/carotid pulses for presence, general rate, quality, regularity, & equality; assess skin color, temp, moisture
   - No carotid pulse →**Traumatic Arrest SOP**
   - If suspected cardiac tamponade, blunt aortic or cardiac injury → **Chest Trauma SOP**
     Hypovolemic shock →**Hypovolemic Shock SOP & below** | Neurogenic shock →**Spine Trauma SOP**
   - **Assess bleeding** type, amount, source(s) and rate | **Hemorrhage control** per System procedures
     - Direct pressure; pressure dressings | Freq. assessment for bleeding
     - If above is ineffective or impractical: Pack wound w/ **hemostatic gauze |** Apply pressure over mounded gauze
     - **Limb w/ uncontrolled bleeding**: **Tourniquet**
     - **Pelvic Fx**: Wrap w/ pelvic binder or in upside down KED
   - **Vascular access:** Actual/potential volume replacement and/or IV meds prior to hospital arrival
     - **IV 0.9% NS** (warm): Catheter size & infusion rate per pt size, hemodynamic status; SOP or OLMC
       SHOCK: 14-16 g. WO up to 1 L based on SBP (MAP) targets, radial pulse, & coherent mental status
       Do not exceed BP targets: Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome
       - **Penetrating torso trauma**: Target SBP 80 (MAP 50-60) (permissive hypotension)
       - **Blunt trauma**: Target SBP 90 (MAP 60-65) | **TBI:** 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 when venous access is difficult/delayed/impossible
     - May use **central venous access devices** already placed based on OLMC
   - Monitor **ECG** if actual or potential CR 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: Rx per Glucose Emergencies SOP
8. **PAIN**: Rx per PAIN Mgt. SOP | **NAUSEA**: **ONDANSETRON** standard dose per IMC
9. **E**xpose/**E**nvironment: Undress to assess as appropriate | Keep patient warm.

CONTINUED

TRANSPORT DECISION

- **Transport to nearest appropriate facility per Region triage criteria** or OLMC orders
- Scene use of **helicopter or alternate transport** means based on local System Policy/Procedure

ITC: Secondary Assessment: Continue SMR if indicated; may complete enroute if pt critical

1. Obtain **full set of VS**: BP (MAP) using correct cuff size): 1st BP manually; then automated OK; trend pulse pressures
   Hemodynamic instability: Hypotension [SBP < 90 (adults) / <70 (peds)] on 2 consecutive measurements, 5 min apart
   Pulse: Rate, quality, rhythmicity **Respirations**: Rate, pattern, depth, effort Temp if indicated
   SAMPLE history: OPQRST of CC / pain using approp. assessment tool consistent with pt's age, condition, and ability to understand
   Allergies (meds, environment, foods) | **Medications** (prescription/OTC – 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 CC; S&S; scope of practice, and level of acuity
   - **HEAD, FACE, EYES, EARS, NOSE, MOUTH:** Drainage | pupil size, shape, equality, reactivity | eye position/ movements / gaze palsies | visual acuity | ability to open & close jaw; malocclusion
   - **NECK:** Carotid pulses, jugular veins, SUBQ emphysema, c- spines; may temporarily remove anterior c-collar to assess neck
   - **CHEST:** Lung/heart sounds
   - **ABDOMEN**: Contour, pulsations, pain referral sites, localized tenderness, guarding, rigidity; rebound tenderness
   - **PELVIS/GU:** Inspect perineum for blood at urinary meatus/rectum
   - **EXTREMITIES:** Inspect for position, false motion, skin color, and S&S 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; SUBQ emphysema
3. **Ongoing assessment**: Reassess VS and pt responses. Every transported pt should have at least 2 sets of VS.
   Stable: At least q. 15 min & after each drug/CR intervention; take last set shortly before arrival at receiving facility
   Unstable: More frequent timing; continue to reassess all abnormal VS & physical findings
4. **Report** pertinent positive/negative signs as able; any major changes from primary assessment
5. **Document** per procedure including Revised Trauma Score parameters on ePCR
6. **Handoff Report:** An EMS "time-out" to allow for an uninterrupted report at receiving facility is useful to ensure continuity of care especially if complete written/electronic ePCRs/EHRs are not available at time of pt handoff.

ADULT GLASGOW COMA SCORE (3-15)	**EYE OPENING** (note if not testable)	Spontaneous	4		***GCS Conversion points**
		To sound	3		GCS 13-15 4
		To pressure	2		GCS 9-12 3
		None	1		GCS 6-8 2
	VERBAL RESPONSE (note if not testable)	Oriented	5		GCS 4-5 1
		Confused	4		GCS 3 0
		Words	3		
		Sounds	2		
		None	1		
	MOTOR RESPONSE (note if not testable)	Obeys commands	6		
		Localizes	5		
		Normal flexion	4		
		Abnormal flexion	3		
		Abnormal extension	2		
		None	1		
ADULT REVISED TRAUMA SCORE (0-12)	***Glasgow Coma Score**				
	Respiratory Rate	10-29	4	**RR score:**	
		30 or above	3		
		6-9	2		
		1-5	1		
		0	0		
	Systolic BP	90 or above	4	**BP Score**	
		76-89	3		
		50-75	2		
		1-49	1	**Total RTS**	
		0	0		

Trauma Triage | Transport Criteria (Adult & Peds)

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

Meets Level I criteria & is >30 min from a Level I TC: may go to closest Level II TC 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

Attempt to keep scene time ≤10 minutes for time-sensitive patients; document reasons for delay

LEVEL I: HIGH RISK for SEVERE INJURY – Transport to the highest level trauma center available within the geographical constraints of the regional trauma system*

Time sensitive patient

Injury patterns

- Penetrating inj. to head, neck, torso, proximal extremities
- Skull deformity, suspected skull fracture
- Suspected SCI with new motor or sensory loss
- Chest wall instability, deformity, or suspected flail chest
- Suspected pelvic fracture
- Suspected fracture of two or more proximal long bones
- Crushed, degloved, mangled or pulseless extremity
- Amputation proximal to wrist or ankle
- Active bleeding requiring a tourniquet or wound packing with continuous pressure

Mental status & vital signs

All patients

- Unable to follow commands (Motor GCS < 6)
- RR < 10 or > 29
- Respiratory distress or need for ventilatory support
- RA SpO_2 < 90%

Age 0-9 years:
SBP < 70 + (2 X age)

Age 10-64 years:
SBP < 90 mmHg
HR > SBP

Age ≥ 65 years:
SBP < 110 mmHg
HR > SBP

CLOSEST TRAUMA CENTER: Patients meeting any one of the YELLOW CRITERIA (below) who DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center as available within the geographic constraints of the regional trauma system (need not be the highest level trauma center)

Mechanism of Injury

- **High risk auto crash**
  - Ejected (partial or complete)
  - Significant intrusion (including roof)
    - > 12 inches occupant site OR > 18" any site
    - Need for extrication for entrapped patient
  - Death in passenger compartment
  - Child (0-9) unrestrained or in unsecured child safety seat
  - Vehicle telemetry data consistent with severe injury
- Rider separated from transport vehicle with significant impact (motorcycle, ATV, horse, etc.)
- Pedestrian/bicycle rider thrown, run over, or with significant impact
- Fall from height > 10 feet (all ages)

EMS Judgment*

Consider additional risk factors including:

- Low level FALLS in young children (age ≤5 years) or older adults (age ≥ 65 years) with significant head impact
- Anticoagulant use
- Suspicion of child (elder) abuse
- Special, high resource healthcare needs**
- Pregnancy >20 wks (fundus level w/ navel or above)
- Burns in conjunction with trauma***
- Children should be triaged preferentially to pediatric capable centers.

If concerned, take to a trauma center

Caveat notes

*RED SECTION: Patients in extremis may require an immediate stop at a closer hospital for procedures not available within the EMS System such as complex airway management. Children should be triaged preferentially to pediatric capable centers.

*YELLOW SECTION: EMS judgment criteria should be considered in the context of resources available in the regional trauma system. May consult OLMC for further direction.
Note: "Low-level" fall refers to less than 10 feet including ground level falls

Examples of special **high resource healthcare needs include patients with underlying conditions requiring complex medical care such as patients with tracheostomies, home ventilators, cardiac assist devices, etc.

***Patients with combined **burns** and trauma should be preferentially transported to a trauma center with burn care capability but if not available then a trauma center takes precedence over a burn center.

DHHS & CDC. (2022). National Guideline for the Field Triage of Injured Patients

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

ITC special considerations: Co-manage with Cardiac Arrest and Trauma Guidelines

- **If normothermic, and blunt or penetrating trauma found in asystole:** Contact OLMC for pronouncement or resuscitation order based on special circumstances
- Any VS before arrest: Start CPR per Cardiac Arrest SOP | Transport immediately
  Complete interventions ENROUTE as time and number of EMS personnel permits
- Assess to find possible **reversible cause(s)** of arrest, e.g., Hs and Ts: hypoxia, hypoventilation, hypothermia hypovolemia, decreased cardiac output secondary to tension pneumothorax, pericardial tamponade, toxins, or
- Control visible hemorrhage per ITC SOP/System procedure
- If decreased/absent lung sounds during PPV and difficulty ventilating pt: suspect pneumothorax (tension): **pleural decompress** affected side (s) (pause CPR briefly during procedure)
- If multi-system trauma or trauma to head and neck: Apply spine motion restriction
- **Vascular access per ITC:** Do not delay transport attempting to start IV on scene.
  If volume losses appear significant: Consecutive 200 mL fluid challenges up to 1 L NS
  Cardiac arrest survival is unlikely if uncorrected severe hypovolemia exists

Caveats:

- Victims of submersion, lightning strike & hypothermia deserve special consideration (See specific SOPs)
- MPI Incidents: Defer resuscitation for those in traumatic arrest until sufficient responders present to meet the needs of living patients

Conducted electrical weapon | Post-TASER Care

1. Scene size up: confer with LEO; 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; use of mind-altering stimulants (PCP, meth, cocaine)
     Secondary assessment: Can have injury/illness that occurs before, during, or after Taser event (fall)
3. **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 a max total dose of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opioids or CNS depressants: ↓ total dose to 0.1 mg/kg
4. **Uncooperative patient exhibiting violence/delirium with extreme agitation**/great strength; numbness to pain
   - Treat per Psych/BHE SOP: Verbal de-escalation; sedation & monitoring; restraint prn for pt/responder safety
   - **KETAMINE** SEDATION dose: 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN / IM (max 300 mg)
     Contact OLMC if higher doses appear needed | See appendix for dose chart
     Use w/ caution in patients with active psychosis
5. **PROBES:** Identify location
   - If probe becomes disengaged: Handle as a sharp; check with LEO to see if they require probes as evidence
     If no: Place directly into a designated sharps container
   - If probe remains attached to pt: Cleanse puncture sites and bandage per System procedure
6. Transport for further evaluation

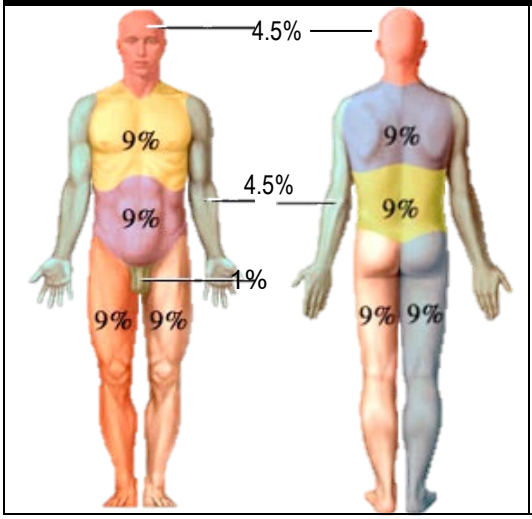
If pt is decisional and refuses Rx / transport: Advise to seek medical attention immediately if they experience any abnormal S or S
If patient denies tetanus immunization in the last 10 yrs, advise to acquire it
Provide disclosure of risk and execute Refusal per System procedure | Contact OLMC from point of patient contact

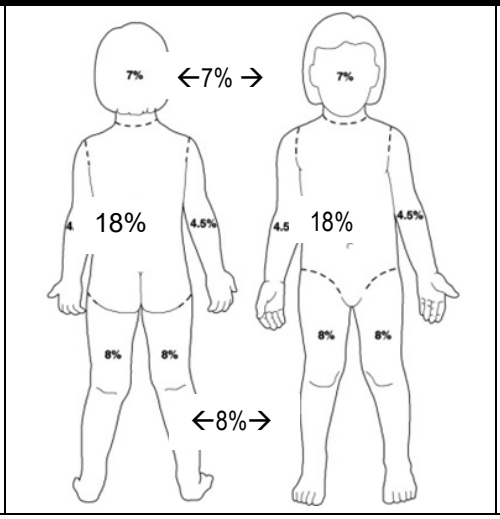
BURNS (Adult & Peds)

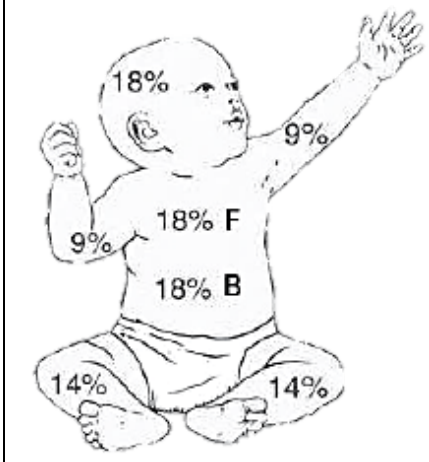
Emergent to Critical: time sensitive pts

1. **ITC** special considerations: (Scene/responder safety top priority)
   - Stop burning process/remove any burning agent (including chemicals) | Cool per thermal wound care next page
   - Remove clothing, jewelry; belts, suspenders, steel-toed shoes (retain heat)
   - Do not pull away clothing stuck to the skin (cut around)
   - Keep burn as clean as possible; wear gloves/mask until burns covered
   - **Airway/breathing – Compromise, hoarseness, wheezing?**
     - Inspect for singed nasal, facial, and eyebrow hairs; burns and edema around the head and neck
     - Auscultate breath sounds | monitor RR, depth, WOB, chest wall motion, and for dyspnea/stridor
     - Assess oxygenation (SpO_2) | ventilation, perfusion, shock ($EtCO_2$ if available)
     - Elevate HOB to decrease airway edema
     - **Assess need for ADV Airway:** Access may be difficult w/ burns of the face or anterior neck
       DAI (largest ETT & least airway trauma possible) may be indicated for pts with severe airway impairment/ respiratory distress; secure w/ ties that can be loosened as edema occurs; don't apply tape to facial burns
   - **Circulation:** Pulse, capillary refill; ECG
     Indications for IV/IO: Non-superficial burns TBSA >15-20% (adults) / 15% (peds) | shock; need for IV meds
     - Avoid if possible, but may start through burned skin if needed; infuse **warm** fluid
     - **If not in shock**: NS IVF 1st hour: **≤ 5 yrs**: 125 mL/hr **6-13 yrs**: 250 mL/hr **≥ 14 yrs**: 500 mL/hr
     - **If in shock**: NS 2-4 mL(start with 2) X kg X %TBSA burned | ½ in 1st 8 hrs (OLMC)
       Titrate to patient response | Document total IVF infused by EMS; report to receiving facility
   - **Mental status**: If AMS consider hypoxia, shock, head trauma, toxic inhalation, alcohol/drug impairment, or hypoglycemia | ✓ **Blood glucose:** If < 70: Rx per Glucose Emergencies SOP
   - **PAIN: Rx per PAIN Mgt. SOP** **Nausea**: **ONDANSETRON** standard dose / ITC
   - **Assess depth**: Pain, swelling, skin color, cap 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:** Use **Rule of 9s** or **Rule of Palms** (palm + fingers together for small or scattered burns up to 15%). 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: Adjust TBSA calculation | Trunk may be up to 50%, each leg up to 20%; Head & arms smaller %
   - **Allergies**: Sulfa? | **Meds**: Those w/ implications for wound healing: immunosuppressants/steroids
     PMH co-morbid factors (preexisting illness, Hx of drug/alcohol use)
     Events: Type of exposure; burning agent; time of exposure; duration of contact; temp of exposure; LOC; history of enclosed space entrapment/smoke exposure; 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 (compartment syndrome); careful ongoing assessments. Transport per Trauma Triage Guidelines

Rule of Nines







THERMAL

2. **WOUND CARE per System protocol**
   - **COOL PT burns <10%** or **FT burns < 2%** with water, NS or Hydrogel burn dressings for 10-20 min; NO ice
   - **Minimize contamination:** If NO Hydrogel dressing**:** Cover burns with plastic wrap to ↓ air movement over skin; ↓ pain; reduce fluid loss; prevent hypothermia, and prevent contamination
   - Apply dry sterile dressings per System policy | Smaller burns < 5% or eyelids: moist dressings
   - Do not break blisters, debride skin, or apply topical ointments, creams, or anti-microbial agents 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 Injury: Heat, smoke, or chemical irritants

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

BLAST Injury: Exposed to an explosive force

2. **Anticipate:** Blunt or penetrating trauma, burns/inhalation injury from positive and negative pressure waves; mass movement of air & debris, and structural collapse. Assess for injuries from shrapnel; barotrauma; burns, crush, or toxic chemical contamination from chemical, biological, radiological, nuclear, and explosive devices/ agents.
3. **Safety**: Consider possibility of subsequent explosions; assess structural safety, possible toxic chemical contamination; poisonous gasses and other hazards | Remove pt. from scene ASAP
4. **Assess for barotrauma**: Dyspnea, cough, hemoptysis, or chest pain; ear drum perforation w/ tinnitus or hearing deficit; ecchymosis of chest wall/hemo-pneumothorax; traumatic emphysema
   S&S air embolism: Can present like AMI, stroke, acute abdomen, blindness, deafness, SCI, and pain with walking
5. **Concussion & eye trauma common**: Rx trauma per appropriate SOP; optimize O_2; don't overhydrate

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

2. **Scene safety**: do not touch pt until certain that electrical source has been disabled/disconnected
3. If unresponsive, apneic and pulseless: Begin CPR and resuscitate per SOP unless contraindicated (Triple Zero)
   Monitor ECG (12 L if available); Rx dysrhythmias / tonic clonic seizures per SOP
   Anticipate respiratory muscle paralysis/arrest | If pulse present: Assist ventilations prn
4. Assess for all contact points (entry/exit wounds) | If lightning MOI determine if direct, side splash or ground strike
   Assess wound appearance/depth (often full thickness) | Lichtenberg figures (reddish, fern-like patterns) from lightning
   No cooling needed unless an associated thermal burn; apply dry sterile dressings
5. Assess for potential associated trauma: Thrown from contact point / compartment syndrome
   Note neurovascular function all limbs | Spine motion restriction per SCI SOP
6. **Event Hx**: Nature of the electrical source (AC vs DC)/lightning; voltage, amperage, duration of exposure if known; position of pt. in relation to electrical source/lightning strike; 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 | Bring in Safety Data Sheets | Early notice to OLMC if decon needed

2. Avoid self-injury; haz-mat precautions | Decon per procedure | Remove contaminated clothing
3. **Flush/irrigate** burn/eyes ASAP per procedure with the cleanest, readily available water or NS unless contraindicated (sulfuric acid, sodium metals, dry chemicals - especially alkalines) using lg. amounts of fluid | Brush away powders/ dry agent before irrigating | Do not "neutralize" or use antidote except per poison center guidance or clear instructions from industry sources (SDS Sheets) (causes a heat reaction)
4. **Hydrofluoric acid** skin burn: Apply **CALCIUM GLUCONATE** 2.5% gel to the burn site (if available) | Monitor ECG

BURN CENTER CONSULTATION CRITERIA (Adult & Peds)

Tailor Triage/Rx to individual pt characteristics, injury severity, area resources, referring institutions (ABA, 2022)

- Deep partial-thickness >10% TBSA; Full thickness >5% | Children/older adults w/ dressing and medical needs
- Burns involving face, hands, feet, genitalia, perineum, or major joints | Electrical; Chemical; Radiation injury
- Frostbite, Stevens–Johnson syndrome/TENS, and necrotizing soft-tissue infection benefit from burn center Rx

Burn Centers within Region 9 transport area): Loyola Med Center (Maywood), Stroger/Cook County Hospital (Chicago); U of Chicago Hospital (Chicago); OSF St. Anthony Med Center (Rockford)

CHEST TRAUMA (Adult & Peds)

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: (Any 1 of these)
   - All penetrating chest trauma | Chest wall instability, deformity, or suspected flail chest
   - Unable to follow commands (Motor GCS < 6) | RR <10 or >29 | Respiratory distress or need for ventilatory support RA SpO_2 <90% | Hemodynamic instability per triage criteria | HR > SBP (shock index)

TENSION PNEUMOTHORAX

Extreme dyspnea, unilateral absence of lung sounds, SBP < 90 (MAP < 65)/hypotensive for age; JVD, resistance to BVM ventilation, ↑ airway resistance, SUBQ emphysema

2. **Needle pleural decompression** on affected side per System procedure while on scene (takes priority over airway)
   Adult: 10 gauge; 3"-3.25" needle or commercial device | **Child ≤12 yrs**: 14-16 gauge, 1½" needle
   Frequently reassess catheter patency | May need to repeat procedure with an 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 patient to maximally exhale or cough if able
     Cover wound: gloved hand, vented /channeled commercial dressing (preferred); defib pad
   - Monitor VS, ventilatory/circulatory status, jugular veins after occlusive dressing applied
     If S&S tension pneumothorax: Temporarily lift side of dressing to allow air release; recover wound; assess need for needle pleural decompression if no improvement after dressing removed
3. If impaled object: Do not remove; stabilize object; continue ITC enroute; implement other protocols as required

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

2. Adult: 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 (MAP < 65): titrate PEEP downward to 5 cm; D/C CPAP if MAP < 60
3. If ventilatory failure or persistent hypoxia persists: ventilate w/ 15L O_2/BVM at 10 BPM [BLS] | ADV Airway [ALS]
4. Monitor for tension pneumothorax: prepare for needle pleural decompression
5. **PAIN**: Rx per PAIN Mgt. SOP; titrate carefully and support ventilations/MAP

Note: Impedance threshold device (RQP) is contraindicated if cardiac arrest occurs

PERICARDIAL TAMPONADE

SBP < 90 (narrowed pulse pressure) (MAP < 65)/hypotensive for age; JVD; muffled heart tones | Lung sounds usually present bilaterally

2. Permissive hypotension: **NS IV WO** enroute just to achieve **SBP 80 (adult) / 70 (peds) |** Additional IVF per OLMC
3. Monitor for PEA: Treat per Traumatic Arrest SOP

BLUNT Aortic and CARDIOVASCULAR INJURY

Ranges from clinically silent, transient dysrhythmias to deadly injuries that include cardiac wall rupture, cardiac contusion, septal and valvular injury, injury to thoracic aorta, AMI/dysfunction; & lethal dysrhythmias.

Aorta: Suspect with rapid deceleration; assess for chest or intrascapular pain, difficulty breathing or swallowing; upper extremity HTN, variation in BP between arms; or bilateral femoral pulse deficits

Blunt cardiac injury: Chest wall bruising, sternal, clavicular or rib fx; S&S cardiogenic shock; ECG/12 L abnormal if unexplained ventricular or 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) (adult) / 70 (peds) | Monitor for pericardial tamponade

EYE Emergencies (Adult & Peds)

General approach:

1. **ITC** special considerations:
   - Quickly assess gross visual acuity in each eye as able: light perception / count fingers / hand motion / read name badge
   - Assess pain | Lids, conjunctiva, sclera, cornea, iris, pupil, lens for S&S of injury, tearing, FB, (lid) spasm
   - Discourage pt from sneezing, coughing, straining, or bending at waist; vomiting precautions (**ONDANSETRON**)
   - Remove and secure contact lenses for transport with patient
2. **PAIN**: If Tetracaine ineffective or contraindicated: Rx per **PAIN Mgt.** SOP

CHEMICAL SPLASH | BURN: EMERGENCY – See Chemical burn SOP

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 tissues.

3. **TETRACAINE 0.5% 1 gtt. each affected eye;** repeat prn
4. **Irrigate** affected eye(s) per procedure using lg. amounts (≥ 500 mL) of NS or any other clean non-toxic liquid immediately available | Do not contaminate uninjured eye during irrigation or use antidote or neutralizing agent | Continue enroute to the hospital

CORNEAL ABRASIONS:

Assess for profuse tearing, severe pain, redness, spasm of eye lid

3. No S&S of penetrating injury: **TETRACAINE 0.5% 1 gtt. each affected eye;** repeat prn
4. Elevate head of stretcher 45˚

PENETRATING INJURY | OPEN GLOBE

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

3. **DO NOT** remove retained FB/impaled object, irrigate eye, instill tetracaine, or apply any pressure to eye
4. Cover affected eye with a **protective shield or paper cup per procedure;** do not patch eye directly
5. Elevate head of stretcher 45˚

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

1. **ITC** special considerations:
   - **Assess for S&S facial injury**, inspect nose for rhinorrhea, oral cavity, nose, ears for FB and gross debris | malocclusion, inability to open or close mouth / bite down or clenched jaw, hematoma under tongue; loose, missing or broken teeth | Motor/sensory deficits (CN 5, 7, 8) | Need for SMR | PMH for **blood thinners**
   - Allow pt to assume position that allows for patent airway (sitting or side-lying unless contraindicated so blood/ secretions drain from nose & mouth) | Avoid aspiration / swallowing blood | Suction prn | No nasal airway adjuncts if midface trauma or above
   - 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 need for IVF | Vomiting/aspiration precautions: **ONDANSETRON** standard dose
   - Control external soft tissue bleeding per procedure | Collect/preserve tissue per Musculoskeletal Trauma SOP
   - **Minimize edema:** Apply cold packs over injury site | **PAIN**: Rx per PAIN Mgt. SOP
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 (not tap water) | Unrecovered teeth may be aspirated If GCS 15, may hold tooth in mouth for transport

- **Mandible fx**: No chin lift; aspiration risk
- **Maxillary fx** (LeFort I-III): Anticipate nasal bone / anterior basilar skull fx

HEAD TRAUMA / Traumatic Brain Injury (TBI)

GCS 13 or less time sensitive

Level I TC: Penetrating inj. to head/neck | Skull deformity, suspected skull fx | Unable to follow commands (Motor GCS < 6) RR < 10 or > 29) | Respiratory distress/need for ventilatory support | RA SpO_2 < 90%

1. **ITC** special considerations:
   - SMR if indicated
   - Mod to severe injury: Continuous SpO_2 and $EtCO_2$ monitoring; prevent/correct hypoxia and hypoventilation ASAP
     DO NOT OVERVENTILATE: Assist/ventilate at 10 BPM prn; maintain $EtCO_2$ at 35-40
     Consider need for advanced airway if unable to oxygenate, ventilate, or protect airway | Must monitor with $EtCO_2$.
   - Vomiting precautions. **ONDANSETRON** prn | Limit **suction** to 10 sec; oxygenate before & after procedure
   - **Scalp wounds**: No unstable/open fractures: direct pressure, hemostatic dressings
   - **12-L 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 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** | If < 70: Rx per Glucose Emergencies 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, insight]; GCS
       Early S&S deterioration: Confusion, agitation, drowsiness, vomiting, severe headache
     - **Pupil** size (normal: 2 -5 mm, ave. 3.5 mm) | Shape (round, irregular, or oval) | Equality (variation ≤ 1 mm)
       Reactivity to light (direct & consensual noted as brisk, sluggish, non-reactive) | **Gaze palsy**
       Change in **visual acuity** or fields | Diplopia | Photophobia (light sensitivity) | Hearing deficits
     - **VS:** BP (MAP), pulse pressure; HR; RR / pattern / depth / effort; SpO_2, $EtCO_2$
     - **Pain** (headache), dizziness | **Motor/sensory** integrity/deficits | **Coordination & balance**
3. If nonresponsive to verbal efforts to calm them or uncooperative in remaining still:
   - **Sedate and monitor**: If SBP ≥ 90 (MAP ≥ 65): **MIDAZOLAM** standard dose for anxiety
   - Restrain as necessary per System procedure | Document reasons for use

↑ **INTRACRANIAL PRESSURE** (CRITICAL): Worsening headaches, vomiting (projectile), and altered mental status varying from drowsiness to coma | Visual changes (blurred, double (diplopia), photophobia); gaze palsies; oval pupil w/ hippus (pupils jiggle when light reflex checked); dilated, nonreactive pupils (unilaterally or bilaterally) | Cushing reflex: ↑ SBP (widened PP); bradycardia; respirations vary (RR often decreased/abnormal pattern) | Stiff neck/nuchal rigidity, and/or abnormal motor/ sensory exams

ITC special considerations:

- Maintain supine position with head in axial alignment
- Assess and trend VS; SpO_2; $EtCO_2$, ECG carefully | O_2 12-15 L/NRM or BVM at 10 BPM
- Assess for S&S of **brain shift (herniation syndrome)** Vary depending on area/structures being compressed:
  Coma (GCS drops by 2 or more points ≤ 8); dilated, nonreactive pupil(s) (ipsilateral to bilateral); motor deficit (contralateral) | Abnormal flexion or extension; whole body flaccid
  If present: Seek OLMC order for **limited hyperventilation: Adult: 17-20 BPM (must be guided by $EtCO_2$ 30-35)**
- Note: NO atropine if bradycardic and SBP ≥ 90 (MAP ≥ 65)

HEAD TRAUMA / TBI cont.

GCS 13 or less time sensitive

BASILAR SKULL FRACTURE (CRITICAL)

Anterior fossa: Telecanthus (wide eyes), periorbital bruising (later), CSF rhinorrhea; lost 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

CONCUSSION:

Disturbance in brain function caused by a direct or indirect force to the head resulting in a variety of non-specific S&S and most often does not involve loss of consciousness. Concussion S&S evolve over time. Repeat assessments are needed.

History:

- Hx of previous of previous concussion? How many? Most recent?
- How long was your recovery from the most recent concussion?
- Have you ever been hospitalized or had medical imaging done for a head injury? Y / N
- Have you ever been diagnosed with headaches or migraines? Y / N
- Do you have a learning disability, dyslexia, ADD / ADHD? Y / N
- Have you ever been diagnosed with depression, anxiety or other psychiatric disorder? Y / N
- Medications

IMMEDIATE (On-Field) SPORT CONCUSSION ASSESSMENT TOOL 5th EDITION (Scat 5)

If any of the "Red Flags" or observable signs are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by a physician or licensed healthcare professional. If the patient is not fully lucid or conscious, assume a cervical injury until proven otherwise.

1. **Red flags**: If currently experiencing or occurred following injury; Time sensitive and transport to hospital
   - Neck pain or tenderness
   - Double vision
   - Weakness/tingling or burning in the arms or legs
   - Severe or increasing HA; pressure in head
   - Loss of consciousness; deteriorating consciousness
   - Increasingly restless agitated or combative
   - Seizures | Vomiting
2. **Observable signs** (witnessed / observed on video): Answered with a yes or no
   - Lying motionless on the playing surface Y / N
   - Balance / gait difficulties / motor incoordination; stumbling, slow/labored movements (Assess cerebellar function per Stroke assessment) Y / N
   - Disorientation / confusion, or an inability to respond appropriately to questions Y / N
   - Blank or vacant look Y / N
   - Facial injury after head trauma Y / N
3. **Memory Assessment – MADDOCKS Questions (assess for amnesia)**
   Beware if lacks awareness of event, has difficulty recalling people/places; feels like in a fog; or difficulty concentrating
   - "I am going to ask you a few questions, listen carefully and give your best effort. Tell me, what happened?"
   - What venue are we at today?
   - Which half (sport-specific reference) is it now?
   - Who scored last?
   - What team did you play last game/meet/event?
   - Did your team win?
4. **Assess GCS | Cognitive screening**: Month, date, year, day of the week; time now within one hour
   Is there any abnormal behavior (change in personality?) | Sensitivity to light or noise?
5. **Cervical Spine Assessment**
   - Is the patient's neck pain-free at rest?
   - If NO neck pain at rest: do they have full range of active pain free movement?
   - Is the limb strength and sensation normal?

MUSCULO-SKELETAL Trauma

1. **ITC** special considerations:
   - Expose wounds/control bleeding per ITC | Pain mgt if tourniquet applied (do not loosen tourniquet to relieve pain)
   - Assess pain, paralysis/paresis, paresthesias, pulses, pressure & pallor (neurovascular status) before & after splinting Assess for deformity, shortening, rotation, or instability
   - **PAIN**: Hemodynamically stable, isolated MS trauma, no contraindications: **Rx per Pain Mgt SOP** (before moving/splinting) Severe **muscle spasm/back pain**: Analgesia as above and/or **MIDAZOLAM** (standard sedation dose)
   - Remove jewelry and potentially constricting clothing from injured limb
2. **Stabilize/immobilize/splint suspected fx/dislocations per procedure | Minimize edema**
   - Gently attempt to **align long-bone fx** unless open; resistance to movement; extreme pain | Splint joints as found
   - If pulses lost after applying traction splint: Do not release traction | Notify OLMC
   - Apply **cold pack** over injury | Elevate extremity unless contraindicated | Dress wounds

AMPUTATION / DEGLOVING INJURIES: Time sensitive pt

Save life over limb | If infield amputation is needed call OLMC
Transport amputations above the wrist or ankle to a replantation center if ground transport times are ≤30 minutes

4. **Amputation incomplete or uncontrolled bleeding**: Hemorrhage control per ITC; splint as necessary
5. **Care of amputated parts:**
   - Attempt to locate all severed parts | Remove gross debris but NOT tissue; do not irrigate
   - Wrap in saline-moistened (not wet) gauze, towel, or sheet | Do NOT immerse in fluid
   - 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 Time sensitive pt

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

4. **ITC** special considerations:
   - Baseline ECG before release (if possible); continue ECG monitoring after release
   - **IV NS TKO** prior to release; WO up to 1 L/hr after release | Elderly: 200 mL IVF challenges (avoid fluid overload)
   - **Assess for HYPERKALEMIA** w/ **cardiotoxicity** (See Chronic Renal Failure SOP)**:** 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 (OLMC may order one or both:
     - **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]
5. If HR >100, restless, ↑ RR, wide QRS, long PR interval, or peaked T waves after above: **IV NS up to 3 L** over 1st **90 mi**n following release unless contraindicated (Ensure clear lung sounds, no SOB)
6. Assess for **COMPARTMENT syndrome**: Pain more intense than expected from injury especially with passive extension of involved muscle; tingling or burning sensations (paresthesia); muscle may feel tight or full Numbness, paralysis, and absent distal pulses are late signs | If present **do not elevate or cool limb**

IMPALED OBJECTS (EMERGENT to CRITICAL depending on location):

4. Do not remove retained FB unless they pose an airway/ventilatory impairment; would interfere with CPR or transport
5. Stabilize object with bulky dressings; insert small (dental size) gauze roll into mouth to absorb excess blood
6. Elevate extremity with impalement if possible

SUSPENSION injury (CRITICAL): "Orthostatic shock while suspended" Person trapped in an upright position within a safety harness with NO movement for prolonged time obstructing venous return from legs to torso. May lose consciousness due to ↓ cerebral blood flow.

At risk for **Reflow Syndrome**: Toxins accumulated in pooled blood return to body after pt lies flat following release

4. Prior to rescue**: Lift legs into a sitting position** if possible
5. **ITC** special considerations: ECG monitoring and IVF per Crush Syndrome above
6. Once released: **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.
7. Treat **dysrhythmias** per SOP. If **significant HYPERKALEMIA** suspected: Rx per Crush Syndrome above

SPINE TRAUMA (Adult & Peds)

"**Spine motion restriction** (SMR)" preferred term over "spinal immobilization" (ACS TQP Spine Injury Best Practices Guidelines, 2022)

1. **ITC** special considerations: Assess in position found
   - Freq. reassess airway / oxygenation (SpO_2 target near 100%) / ventilations ($EtCO_2$ target 35-45), ability to talk; muscles used to breathe (beware use of diaphragm only)
   - If airway compromise | RR/depth diminishes | ventilatory failure is imminent/present: Prepare for ADV airway w/ in-line stabilization and/or ventilatory support (CPAP or PPV) | Suction precautions
   - Assess for **shock** (neurogenic next page): Avoid hypotension for age | IVF NS per ITC | **Adult MAP goal: 85-90**
   - **Prevent hypothermia**: Pt may be unable to maintain a constant core temperature
   - **Nausea**/vomiting: **ONDANSETRON** standard dose per IMC
   - **PAIN**: Rx/ PAIN Mgt SOP | Titrate carefully- judicious use of opioids | Avoid resp. depression; preserve neuro function
2. **Consider pt age / comorbidities / assoc. injuries / MOI / exam findings to determine risk of SCI:** Older age is a risk factor independent of MOI: osteoporosis; degenerative and age-related changes
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 exam for evidence suggesting SCI**
   - **Pain** or pressure in neck, head, or back | spine **Pain/tenderness/deformity** to **palpation**
   - **Paralysis/paresis:** Abnormal/asymmetric motor exam in upper and/or lower extremities
   - Abnormal **P**erception /**sensory alterations** (sharp/dull or deep pressure): Numb to all touch painful
   - **Paresthesias** (abnormal sensations): tingling, "pins and needles", burning, electric shock
   - **Pr**iapism | **P**roprioception (position sense) deficit | **P**oikilothermia (altered thermoregulation)
   - No sweating below injury | **Spinal** and/or **Neurogenic shock**; | Abnormal breathing (diaphragm only)
   - Abnormal **P**osition (Head tilt or arm "Hold-up") | Muscle tone deficit - Loss of bowel or bladder tone
5. **Spine motion restriction indications following blunt trauma** (also see **Elderly** SOP: All falls)
   - Acutely altered mental status (GCS <15, evidence of intoxication) plus a MOI
   - Midline neck or back pain and/or tenderness
   - Focal neurologic S&S (e.g., numbness or motor weakness)
   - Anatomic deformity of the spine
   - Distracting circumstances or injury (long bone fx, degloving, or crush injuries, large burns, emotional distress, communication barrier, etc.) or any injury that impairs pt's ability to contribute to a reliable examination

   Contraindications to SMR: Penetrating trauma to head, neck, or torso
6. **Methods of providing SMR:**
   - Can be achieved with a backboard, scoop stretcher, vacuum splint, ambulance cot, or other similar devices
     If indicated: **apply SMR to the entire spine due to the risk of noncontiguous injuries**
     Assure sufficient number of trained individuals to assist with pt transfers to minimize risk for displacement
     Unstable spinal column injuries can progress to severe neuro injuries in the presence of excessive movement
   - **Manually stabilize head & neck** | Keep in position found until exam is done unless movement is needed to maintain the airway | NEVER apply traction to the neck
   - **If exam is normal:** Have pt attempt to move head & neck into axial alignment | Stop if pain/resistance
     If exam is abnormal (acute deficits): Splint as found unless airway cannot be secured
   - **C-collar** (appropriately sized & unless contraindicated)
     SMR cannot be properly performed with a c-collar only or on a patient in a sitting position
   - **Extrication** from motor vehicle
     - **Conscious w/o severe injury or acute neuro deficits / can follow commands:**
       Adult / child in booster may **self- extricate** w/ as little spine movement as possible onto stretcher
       Remove smaller child while strapped in car seat
     - **Unstable location/pt or acute neuro deficits**: Extricate per procedure | move to cot for evaluation
   - **Mechanical splinting:** Keep head, neck, and torso in alignment if possible
     - Use blocks, blanket roll, or head immobilizer to minimize flexion, extension, or rotation of head/neck
     - Fill voids prn | Secure device & pt to stretcher with appropriate straps; protect paralyzed limbs
   - **If head elevation required:** Elevate splinting device at the head while maintaining axial alignment

SPINE TRAUMA (Adult & Peds) cont.

Methods of providing SMR continued:

- **Children** ≤ 3 yrs are abdominal breathers; place straps over chest/pelvis, not abdomen. Heads are disproportionately large. Board should have recess for head or elevate shoulders/torso 1-2 cm to avoid neck flexion when SMR applied.
- All **pt transfers** create the potential for displacement of unstable spine injuries. Use a scoop stretcher, long spine board, or a vacuum mattress to minimize flexion, extension, or rotation of the possibly injured spine.
- **Once** pt is safely positioned **on an ambulance cot, transfer or extrication devices may be removed if** an adequate number of trained personnel are present to minimize unnecessary movement during the removal process. The risks of pt manipulation must be weighed against the benefits of device removal. If transport time is short, may transport pt on the device and remove upon hospital arrival. If extrication device is removed in the field, SMR should be maintained by assuring pt remains securely positioned on cot with c-collar/mechanical splinting (as above) in place.
- Hospitals should be prepared and equipped to carefully and quickly remove pts from a scoop stretcher, long backboard, or vacuum mattress ASAP after hospital arrival. **Safe transfer** may require the use of a slider board or similar device to maintain SMR during pt movement. Procedures must assure a sufficient number of properly trained individuals are available to assist with pt transfers to minimize risk of inadvertent displacement of a potentially unstable spinal injury.

7. If uncooperative in remaining still due to injury/impairment: **Assess need for sedation**
   If NO loss of consciousness or resp. depression & SBP normal for age / ≥ 90 (MAP ≥65): **MIDAZOLAM** (standard dose)

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

Athletic protective equipment varies by sport/activity; and styles 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 protective equipment (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): Disruption of the SNS w/ preservation of the parasympathetic NS

Injuries to cervical and high thoracic (T1-6) cord may cause a vasodilatory shock resulting in SBP < 90; **HR < 60** (unopposed Vagal tone); & warm/dry skin below injury; $EtCO_2$ ≤ 31 possible | Consider & Rx other causes of hypotension in acute trauma: hemorrhage, tension pneumothorax, myocardial injury, and pericardial tamponade

- **NS IVF: Adults:** 200 mL increments **up to 1 L** to achieve/maintain MAP 85-90 | Peds 20 mL/kg to target SBP for age
  Reassess VS and lung sounds after each increment | Avoid fluid overload
- ↓ HR & BP persist: **ATROPINE 1 mg rapid IVP (Peds:** 0.02 mg/kg IV/IO minimum 0.1 mg to 1 mg single dose)
  May repeat q. 3 minutes to a max total dose for age: Adult: 3 mg IVP / Peds 2 mg
- ↓ BP persists: **NOREPINEPHRINE** drip IV (lg. vein) / IO: Conc: 4 mg in 1,000 mL NS (4 mcg/mL) (Use of IV pump preferred)
  Adult Initial dose: 8 mcg/min (2 mL/min) titrated to reach SBP ≥ 90 (MAP ≥ 65)
  Peds Initial dose: 0.1 mcg/kg/min (max 1 mcg/kg/min up to 8 mcg/min) titrated to SBP >70 + (2 X age in yrs)
  Higher doses (10 mcg/min) RARELY needed – contact OLMC. Assess BP (MAP) q. 2 min until target BP is reached (don't overshoot) | Then reduce dose (drip rate) incrementally just to maintain at BP targets.
  Maintenance: Adult: 2 to 4 mcg/min (0.5 mL to 1 mL/min) or less | Continue to reassess BP q. 5 min.

MULTIPLE PATIENT INCIDENTS (NR)

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.

Element	Small scale incident	Medium to large scale incident
Definition/trigger Scale incident based on resources	Resources avail. w/in 15 min make normal care achievable for most seriously injured All time-sensitive patients can be transported w/in a 10 min scene time **"Business as usual" within scope of normal operation** **Do the best for each individual**	▪ Normal EMS response and care unachievable; **and/or** ▪ Resources avail. within 15 min are INSUFFICIENT to provide normal levels of care/transport per SOP **and/or** ▪ Stabilization capabilities of hospitals reachable within ground transport time of 30 min are INSUFFICIENT to handle all pts. May need to activate disaster plans. **Greatest good for greatest number**
Triage required	YES – all persons on scene; using START/JUMPstart	
Triage **tags**	Optional	Mandatory
PCRs	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 must be safely secured**
Refusal process	Applies	Attempt - may not be possible

1. **Scene size up/ensure safety |** Determine if help is needed | Notify dispatch: Call for an officer; describe incident: nature, location, presence of debris, hazards (need for decon), traffic, entrapments, estimated # pts
   Ask dispatch to alert RH if Med-Lg. scale incident | Help with triage/treatment when initial communication is complete.
2. First arriving EMS personnel/(acting) officer becomes **initial IC | Establish scene command.** Determine incident scale, build resources, make assignments; deploy ID vests if mutual aid involved to ID key personnel.
   Medical group: Inform IC re: needed resources (additional amb., helicopter, personnel, equipment)

SORT – ASSESS (TRIAGE)

- **Primary triage**: Sort the **walkers**, the **wavers** (can follow commands/cannot move themselves), and the **still**. Assess the "still" first.
  Assign triage categories (R-Y-G-deceased) | Recognize futility; care and Rx dictated by physiologic state
- Update IC re: # of pts & triage categories | Assure pts. are moved to Tx area | When done report to MED for reassignment

LIFE-SAVING INTERVENTIONS | TREATMENT

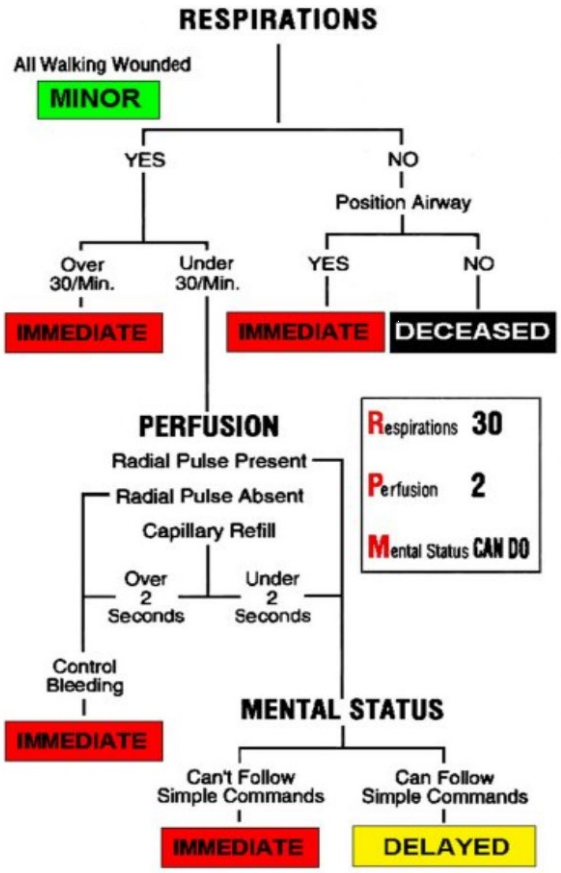
- **During Primary Triage**: Provide life-saving interventions that take < 1 min and do not require anyone to stay with pt: Control bleeding w/ hemostatic gauze/tourniquets | manually open airway | give 2 breaths to child/infant found apneic | needle decompress tension pneumothorax | give chemical toxin antidote per autoinjector
- **Establish/manage (R-Y-G) Treatment (Tx) areas;** ensure ongoing **secondary triage** (w/ revised trauma scoring); provide Rx as able per SOP

TRANSPORTATION

- Prioritize pts. for transport | Coordinate departures w/ transportation officer
- Establish **loading area** accessible to **Tx area** that allows safe/coordinated access & egress
- Request ambulances from staging. Assign pts to ambulances based on triage priority.
  Immediately send up to 2 of the most critical pts to each hospital that can be reached in 30 min (help clear scene).
- **COMMUNICATION: Small-scale**: Contact hospital per local policy to distribute remaining pts
  Med-large scale: Contact **Resource Hospital** (RH) ASAP: Relay nature of incident; # pts.; categories; age groups, functional needs; need for decontamination | Report hospitals already getting their first 2 pts
  RH duties: Assess receiving hospital capabilities, triage locations, & relay info to scene. **Exchange call back numbers.**
- **Assign hospital destinations to remaining pts** based on traffic patterns, hospital resources available, and acuity. Attempt to evenly distribute pts – **do not overburden one facility.** Preferable (not mandatory) to keep families together. Notify EMS crew re: destination and location of hospital triage intake/decon; provide maps prn
- **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.

"A medical disaster occurs when the destructive effects of natural or man-made forces overwhelm the ability of a given area or community to meet the demand for healthcare" (ACEP, 2006). EMS MD or IDPH may suspend normal EMS operations and direct that care be conducted by SOP and/or using personnel/resources as available.

Disaster Distress Helpline - 1-800-985-5990



START TRIAGE: For Primary triage only

RED - Priority 1 - IMMEDIATE = Emergent

- Resp. >30 | Resp. resume after head tilt
- Pulse: radial absent/carotid present
- Delayed capillary refill (> 2 sec)
- Severe bleeding/control measures
- AMS; cannot follow commands
- Emotionally disruptive pt. | First responder

YELLOW - Priority 2 - DELAYED = Urgent

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

GREEN - Priority 3 - MINOR = Non-urgent

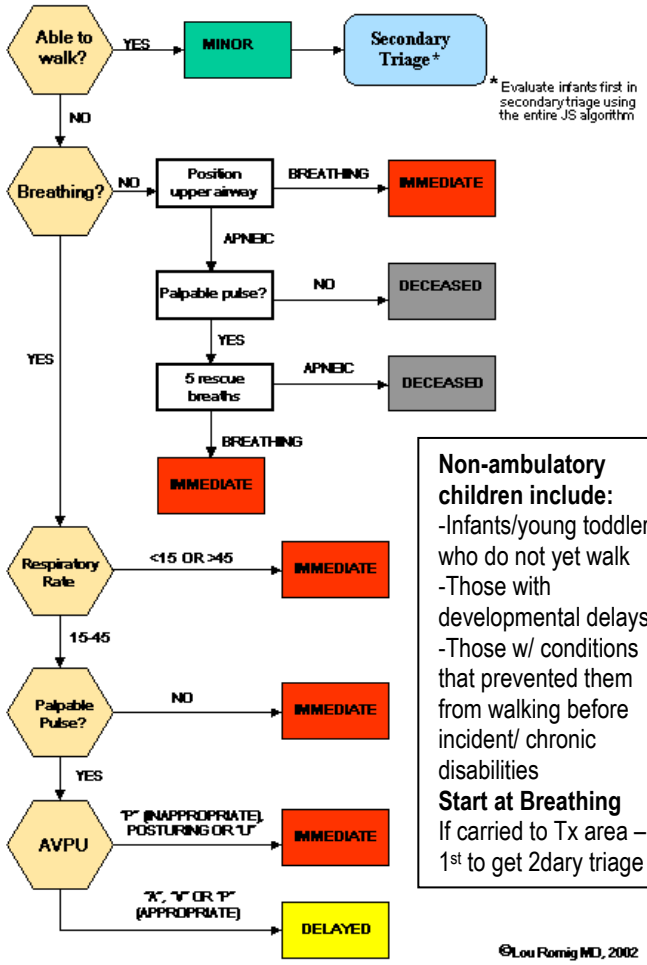
Can walk; Direct to a specific location

Expectant/DECEASED – Priority 0

Dead or obviously dying; injuries incompatible w/ survival - Apneic after opening airway

SECONDARY Triage: Use the **Revised Trauma Score** (RTS) to determine triage priority: **GCS, RR, & SBP |** See SOP p. 44 | **Scores range from 0-12**

12: Priority 3 (green)
11: Priority 2 (yellow)
10 or less: Priority 1 (red)



Non-ambulatory children include:
-Infants/young toddlers who do not yet walk
-Those with developmental delays
-Those w/ conditions that prevented them from walking before incident/ chronic disabilities
Start at Breathing
If carried to Tx area – 1st to get 2dary triage

JUMP START: Any pt who appears to be a child

RED - Priority 1 - IMMEDIATE = Emergent

- Apneic & breathes after opening airway and/or 5 rescue breaths
- RR < 15 or > 45 | severe distress
- Severe bleeding/control measures
- Shock | No pulse w/ RR 15 - 45
- Open chest or abdominal wounds
- AVPU: Unresponsive / Inap. pain response

YELLOW - Priority 2 – DELAYED = Urgent

Can't walk; RR 15-45; + pulse | mod. blood loss
Burns w/ no resp. distress | SCI | Awake w/ TBI
"A", "V" or appropriate "P" pain response

GREEN - Priority 3 – MINOR = Non-urgent

- Can walk | Nonambulatory see box to left
- Fx **w/o** neurovascular compromise/gross deformity
- Bleeding controlled; non-arterial bleed/lac
- Direct to a *specific location* for secondary triage

Expectant/DECEASED - Priority 0

Dead or obviously dying; injuries incompatible w/ survival

- Apneic w/ pulse after airway opened + 5 rescue breaths
- No palpable pulse | Obvious massive TBI
- Re-evaluate after more resources available

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 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 thermoluminescent 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.
   - Remove outer protective clothing/gloves and don clean gloves for handling patient enroute
   - Cover ambulance floor 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 (vapor, particulate, liquid). Onset of toxicity can occur within minutes up to a few hours depending on concentration. Upon arrival, may see many people "down" in need of immediate attention. This may be the only indication of a chemical release. Scene safety top priority. 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), and respiratory failure.

- **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 (anterolateral 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 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.
- **Alert Resource Hospital re incident and to request CHEMPACK supplies**. RH alerts 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, involuntary 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 g 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 dose** for seizures

IDPH CHEMPACK Plan | REQUESTS

https://dph.illinois.gov/topics-services/emergency-preparedness-response/public-health-care-system-preparedness.html

CHEMPACK ASSET REQUESTS*

- A deliberate or accidental chemical nerve agent release can occur anywhere in the U.S. or its territories.
- Any major release would require additional supplies of chemical nerve agent antidotes.
- CHEMPACK chemical nerve agent antidotes can be distributed throughout Region IX.
- When it is determined that a chemical or nerve agent release has threatened the medical security of a city and has put multiple lives at risk, and is beyond the local emergency response capabilities medically necessary to save lives, the **CHEMPACK** assets may be requested and deployed from the CHEMPACK cache site.
- Hospitals and EMS responders will expend local resources before using the CHEMPACK supplies.
- This protocol is an adjunct to each EMS agency's CHEMPACK plan, which includes at a minimum: triggers for requesting CHEMPACK supplies; protocols for receiving, distributing and disposal of the CHEMPACK assets.

1. **If CHEMPACK assets needed**: Incident Commander shall activate their agency's CHEMPACK plan and notify their EMS System Resource Hospital of the situation
   The Resource Hospital ED Charge Physician will determine if CHEMPACK assets are necessary
2. **Provide the following information to the Resource Hospital and the CHEMPACK cache site:**
   - Time of chemical release exposure
   - Location of exposure event
   - Suspected chemical agent, if possible
   - Estimated number of victims
   - On-scene Incident Commander's contact name and phone number
   - Location to deliver assets
   - Individual that will be receiving the assets (Incident Commander, Logistics Section Chief, Medical Officer, Treatment Officer)
3. **If ED Charge Physician authorizes release of CHEMPACK assets,** the Resource Hospital shall contact the appropriate CHEMPACK cache site of the need to deploy 1/3rd (or as needed) of their EMS CHEMPACK assets. Provide that facility's ED Charge Nurse with the above listed information. Resource Hospitals with a CHEMPACK cache will deploy 1/3rd of their assets (or as needed) prior to contacting the closest CHEMPACK cache site.

4. **EMS (Field) Incident Site Mobilization**
   - The designated receiving agency individual (e.g. Incident Commander, Logistics Section Chief, Medical Officer, Treatment Officer) will sign for custody of the delivered CHEMPACK assets on Copy B- **Yellow Chain of Custody Transfer Form**, releasing the Law Enforcement courier of custody of the material. Copy B -Yellow will remain with Law Enforcement courier.
   - Copy C – **Blue Chain of Custody Transfer form** will remain with the receiving agency.
   - The designated receiving agency individual who signed for the CHEMPACK assets at the incident site will be responsible for the accounting, securing, deploying, and reporting of the unused assets.
   - The EMS System Provider will be responsible for the transportation of the EMS CHEMPACK materials to the specific site location where they will be secured and maintained and dispensed.

5. **EMS (Field) Incident Site Demobilization**
   - SUPPLIES REMOVED FROM THE CHEMPACK CONTAINER CANNOT BE RETURNED TO THE CONTAINER
   - After the event has been concluded, the EMS Provider will be responsible for the transportation of any unused CHEMPACK assets back to their agency where they will be secured until instructions are given regarding disposal.
   - Following demobilization and no later than 24 hours after the event, the EMS Provider individual who signed for the CHEMPACK assets will notify the Cache Sites and the IDPH Medical Counter Measures (MCM) of the usage amount and status of any deployed unused CHEMPACK materials.
   - **Obtain instructions for disposal of any unused materials from:** IDPH MCM Program Manager **– IDPH/OPR: 217-836-9367**
   - EMS Provider individual who signed for CHEMPACK assets will forward

Copy D – Pink Chain of Custody Transfer Form to:
IDPH Office of Preparedness and Response Medical Counter Measures Program
422 S. 5th Street; Springfield, Illinois 62701

*Taken from the IDPH CHEMPACK Plan

ACTIVE ASSAILANT RESPONSE

Purpose: Describe the roles and responsibilities of EMS when working with law enforcement officers (LEO) at or near a mass violence incident. LEOs always are the lead agency on these incidents; EMS shall follow their non-medical instructions as appropriate.

DEFINITIONS:

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

Ballistic Protective Equipment (BPE) - 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 (PCP) – Location used for the assembly, triage, medical stabilization and evacuation of casualties. May be 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 – Area where there is little or no threat, due to 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 LEOs who form at the scene and deploy to the assailant's location, make contact with and eliminate the threat to prevent further injury and/or loss of life.

Hard lockdown – Specific to schools; used when a serious/volatile situation exists that could jeopardize the safety of students and staff. Building occupants will ignore all bells and fire alarms unless they receive verbal instructions from local emergency responders or conditions warrant evacuation of the area (fire, structural damage). No one is allowed to enter or exit the building. 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 LEOs 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 when conditions outside the school building could potentially pose a threat to student and staff safety. OR, a situation in the building where school or local emergency responders need to keep students and staff in classrooms and away from an incident or activity. Students and staff can continue normal activities, but shall not leave classrooms or officers until advised to do so. No one may enter or leave the building until ended. 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.

ACTIVE ASSAILANT RESPONSE cont.

GUIDELINES

1. **Response and staging**: 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 shall remain with their vehicles and watch for responding emergency personnel and move the vehicles as needed.

2. Establish **Incident Command (IC)** and Unified Command (UC) per local policy ASAP

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. **Scene 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. Barriers may be placed at intersections to stop traffic from entering area. Inform EMS re: road blocks that impact their response. Attempt to limit unauthorized persons from gaining access to scene. Request resources to handle professionally. Do not engage with hostile citizens. Notify Unified command ASAP. PD should establish a **"Reunification Site".** Direct families/loved ones to that location.

5. **Explosive Devices: High index of suspicion (scan environment).** If responding to an explosive detonation, consider likelihood of second device in the immediate or adjacent areas. If an item seems suspicious and suspected of being an explosive device, immediately withdraw and contact UC. Request 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, Technical Rescue Team [TRT] for structural collapse).

6. **Patient transport**: Coordinate with the EMS Group (Transportation Officer) plus the RGS. EMS shall follow current System policies pertaining to MPIs | anticipate that self-evacuated pts may seek treatment. Transport only pts triaged RED immediately. Transporting minor injuries first depletes on-scene resources to care for 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 casualty count; ensure adequate resources to handle them; form RTFs to deploy when requested by PD; equip with appropriate BPE, medical supplies and pt carrying devices for ready response; consider elevating incident to a higher alarm before resources are required.
   - Establish Level 2 staging area in coordination with PD; clear route for emergency vehicles; assign staging officer
   - Consider need for 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 (minor injuries). Broadcast location to all units. Drive to Rx area if needed.
   - Appoint **Triage Officer, Treatment Officer, and Transportation Officer**
   - If pts with minor injuries are transported prior to threat being neutralized, transport to further hospitals reserving the nearest hospitals for severely injured patients who may still need to be evacuated.
   - Establish access and egress route for EMS vehicles. Ask PD to help keep it clear.
   - Notify Resource Hospital ASAP re: nature of incident; estimated # of casualties.
   - Gather medical supplies from FD vehicles including mass casualty bags if on site.

9. **Rescue Task Force (RTF) Actions** (Reference MABAS document)
   - Don BPE/PPE in a safe area prior to entering the warm zone. Carry Active Assailant "Sling" packs with appropriate trauma supplies (tourniquets/hemostatic gauze/chest seals), webbing, and evacuation litters.
   - If PD engages a threat leaving RTFs unprotected: Take cover behind protective barriers, e.g., brick walls, vehicles (use concealment if suitable protective barriers unavailable)
   - **Inside Warm Zone:** Move as directed by PD | Advise IC of # and location of victims | **stop external bleeding** if possible | **seal chest wounds** | **open airways manually |** place in **recovery position |** keep warm if possible and continue search for more casualties until no more are found in Warm Zone.
     If resources allow: one RTF may begin removing pts to PCP while others continue making pt contacts.
   - PD protecting RTFs will determine safest path of travel for entry and exit (through a window).
   - When RTFs are leaving Warm Zone, PD will protect group as effectively as possible.

Transport of LEO / canine | TEMS

10. **Transport of injured Law Enforcement Officer (LEO) and/or dog**:

    When PD member or canine is transported, EMS should stay at hospital and act as a liaison until law enforcement rep arrives. Attempt to secure injured LEO's weapon by transferring custody to an on-scene PD officer.
    If unable, EMS shall secure weapon(s) in ambulance gun safe.

    For Rx of injured police dog – see Policy A3: ALS to EMR Services/Scopes of Practice

    Veterinary Specialty Center 2051 Waukegan Rd, Bannockburn, IL 60015 | Hours: 24/7 | Phone: (847) 459-7535 (call ahead)

11. **Tactical EMS (TEMS) personnel** operate under specific policies/procedures: See Local policies & procedures

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

Adult ABUSE | Neglect | Maltreatment | Trafficking

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/employed at a private home/ public shelter which is sheltering an abused family or household member

"Abuse" and "Domestic violence": Physical abuse, harassment, intimidation of a dependent, interference with personal liberty or willful deprivation but does not include reasonable direction of a minor child by a parent or person in loco parentis.

"Physical abuse" includes sexual abuse and means any of the following: (i) knowing or reckless use of physical force, confinement or restraint; (ii) knowing, repeated and unnecessary sleep deprivation; or (iii) knowing or reckless conduct which creates an immediate risk of physical harm.

"Harassment" means knowing conduct which is not necessary to accomplish a purpose that is reasonable under the circumstances; would cause a reasonable person emotional distress; and does cause emotional distress to the petitioner.

Human trafficking: "Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; or the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage or slavery." [U.S.C.§ 7102(8)]

EMS shall provide immediate assistance and support for victims and witnesses of domestic or personal violence. Dispatchers should use discretion prior to canceling a call for service if made by a person other than the original caller.

If any form of abuse, maltreatment, harassment, intimidation, trafficking, 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 law enforcement backup
2. **IMC** special considerations:
   - Observe for the universal **Signal for Help:** Alerts others that a person feels threatened and needs help Person holds one hand with the thumb tucked into the palm and folds the four fingers over the thumb, symbolically trapping the thumb by the rest of the fingers.
   - Provide psychological support | Treat obvious injuries per appropriate SOP
   - Discourage patients from changing clothes, urinating, or washing away signs of abuse or violence
   - Cooperate with LEO to use all reasonable means to prevent further abuse or neglect
3. Illinois law requires EMS to give suspected adult abuse victims **information on services** available if safe to do so
   - Inform them that they do not have to tolerate abusive behavior or trafficking
   - They + family members have the right to be protected from abuse and to press criminal charges against offenders
   - Assure pt that the abuse or trafficking is not their fault; encourage them to seek medical attention
3. EMS personnel are not mandatory reporters of adult abuse | Report suspicions to the receiving facility Document scene factors, S&S, and statements made by pt/bystanders that support suspicions of abuse/violence

National Domestic Violence Hotline - Call or text "START" to 1-800-799-7233
National Sexual Assault Hotline at 1-800-656-HOPE (4673)
The Polaris Project (human trafficking information): https://polarisproject.org/ | Text BEFREE to 233733
National Human Trafficking Resource Center (great info): https://humantraffickinghotline.org 1-888-373-7888

Eligible adults under Adult Protective Services Act

- **"Abuse"** means causing any physical, mental or sexual injury to an eligible adult, including exploitation of such adult's financial resources, and abandonment.
- **"Eligible adult"** means either an **adult with disabilities aged 18 -59 or a person aged 60 or older** who resides in a domestic living situation and is, or is alleged to be, abused, abandoned, neglected, or financially exploited by another individual or who neglects himself or herself.

EMS personnel are mandatory reporters of suspected elder abuse. Mandatory reporting requirements only apply when the reporter believes that the adult is not capable of reporting the abuse, neglect, or financial exploitation themselves.

Adult Protective Services Hotline: 1-866-800-1409
For residents of nursing facilities - **IDPH Nursing Home Complaint Hotline: 1-800-252-4343**
Supportive Living Facilities - IL Dept. of Healthcare and Family Services' SLF Hotline: **1-800-226-0768**

(320 ILCS 20/) Adult Protective Services Act: | IL Dept. on Aging: https://www2.illinois.gov/aging/ProtectionAdvocacy/Pages/abuse_reporting.aspx
Illinois Domestic Violence Act of 1986 (Source: P.A. 84-1305.) https://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=2100&ChapterID=59

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
     ADV airway per SOP: Gentle technique; may need one size smaller ET tube; normal size i-gel
   - **O_2** 12-15 L / tight fitting mask 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 prn – **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 mgt.: – Acetaminophen preferred | Fentanyl:** Category C | Ketamine not recommended in pregnancy
     Consult with OLMC | Balance potential benefits to mother against possible hazard to 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/presenting parts.
   - **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 EMS presence: Evaluate color, consistency, odor, quantity of fluid
     Port wine: Abruptio placenta | Green: meconium | Foul smelling: infection | Assess for prolapsed cord
3. Prepare for delivery if signs of imminent birth are present

Parameter	Normal	Changes in pregnancy
Blood volume	5 L	Increased 40-50%; May NOT show S&S of shock until ≥ 30% blood loss
HR	70	Increased 10-15 BPM higher than pre-pregnant state
Blood pressure	110-120/70	Decreased 10-15 mmHg in 2nd trimester; returns to normal 3rd trimester Beware supine hypotensive syndrome > 20 wks Venacaval & aortic compression when supine ↓ RV preload & CO by 30-40%
Cardiac output	5 L/min	Increased 20-30%
Hemoglobin/hematocrit	13-15 / 40	Decreased due to plasma dilution (physiologic anemia)
$EtCO_2$	35-45	25-32 > 10 wks gestation: Hyperventilation normal (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 clinical presentations after trauma. Highest risk with injuries to thorax, abdomen, and pelvis
- Prime causes of fetal death d/t trauma: placental abruption; maternal death; maternal hypovolemic shock; **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 a 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 | any delivery complications?
   - **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, SUD, teenage pregnancy, mom ≥ 35 yrs; PMH 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 mom to pant or blow during contractions
   - If **hypotensive or lightheaded**: Turn on side; O_2 12-15 L/NRM; NS IVF boluses in 200 mL increments up to 1 L
3. ✓ **for S&S imminent delivery:** Contractions ≤ 2 min apart; bulging/crowning during contraction, involuntary pushing, urgency to move bowels
   - **DELIVERY NOT IMMINENT**: Allow pt. to assume most comfortable position; transport to hospital w/ OB services
   - **DELIVERY IS IMMINENT:**
     - **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 content cleanliness; place absorbent materials beneath perineum and drapes over abdomen and each leg | Prepare bulb syringe, cord clamps, scalpel, and Chux to dry and warm infant | Ready neonatal BVM, NRM, resuscitation equipment, O_2 supply | Prepare 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. **Care immediately after delivery:**
   - Rapidly **dry** | Place healthy baby who does not require resuscitation on mom's abdomen for skin to skin contact
   - Term gestation? Good tone? Breathing or crying?
     Breathing should begin in 30-60 sec. | If breathing well/crying: should not need tactile stimulation or suctioning
     If no breathing: Suction mouth, then nose using bulb syringe to clear airway | Gently rub back or flick soles of feet
   - **Assess HR** initially by auscultation and/or palpation

     If apnea, gasping; labored breathing; RR < 40; cyanosis; HR < 100 → **Newborn Resuscitation** SOP
   - **Prevent hypothermia**: Maintain normal temp | Use infant warming device or wrap if available | Cover head with stockinette cap
2. **Cord care: When pulsations stop clamp 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 with mom for transport
   - Check cord ends for bleeding
3. Obtain **1 and 5 minute APGAR scores:** If ≤ 6 → Newborn Resuscitation SOP
4. Place ID tags on the mother and infant with the mother's name, delivery date and time, infant gender
5. **Transport considerations**: Transport baby in an infant car seat secured so the infant rides facing backward or in an approved commercial device for newborns per local procedure. Pad around infant prn
   Do NOT carry infant into ED or OB 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 | gestation in weeks if known | delivery presentation (head or breech)
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 torn/bleeding: apply direct pressure with sanitary pads and have patient bring 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: **Time Sensitive Pt**
   - **IV NS** fluid challenges in 200 mL increments titrated to patient response up to 1 L
   - **Massage 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 pt

BREECH BIRTH

- A footling/frank breech generally delivers in 3 stages: legs → abdomen | abdomen → shoulders | and head
- Dangerous times for the infant (risk of hypoxia): 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 fluid challenges
   - 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 torso / 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 a 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

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

NEWBORN RESUSCITATION (APGAR = 6 OR LESS)

Time sensitive pt

Peri-viable birth (Delivery at 20 - 26 wks of gestation): Factors that influence survivability: gestational age; birth weight; gender (female), singleton birth, use of antenatal steroids

- Difficult to determine exact gestational age in the field. If any possibility that baby > 20 weeks gestation and has any of these: cyanosis with **spontaneous ventilations, 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 care (**Level III NICU –** see Hospital specialty designations **in Appendix**)
- "If a birth is at the lower limit of viability or involves a condition likely to result in early death or severe morbidity (severe congenital anomalies), noninitiation or limitation of neonatal resuscitation is reasonable after OLMC consultation and parental involvement in decision-making" (AHA, 2020)

All births - General caveats:

- Majority of newborns require no resuscitation beyond drying, warming, mild stimulation, and airway suctioning Those that do my be critically ill and need **expeditious transport to a hospital with OB capabilities**
- **Acrocyanosis:** Peripheral cyanosis around mouth, hands & feet is often seen in healthy newborns Caused by peripheral vasoconstriction and increased tissue O_2 extraction. Differentiate from central cyanosis.
- **Central cyanosis:** Caused by reduced arterial O_2 sats; normal up to 5 to 10 min after birth when SpO_2 should rise to 85%-95% (see chart) | Persistent central cyanosis is abnormal | Evaluate and treat promptly
- Apply cardiac monitor to all newborn infants requiring resuscitation [ALS]

STEPS in RESUSCITATION

1. **Assess RR/distress | motor tone | HR**: Do not wait for APGAR score to begin resuscitating if obvious distress Connect to ECG monitor to assess HR [ALS]
2. **Warm** (maintain normal temp) **| Dry | Stimulate** by flicking the soles of the feet and/or rubbing the back
3. **If weak cry, ineffective breathing, poor tone, or preterm:** Position supine with 1" pad under back/shoulders to align head & neck in a neutral position | **Suction** mouth then nose with a bulb syringe | **Monitor HR**
4. **If dusky| RR > 40 & adequate effort | HR ≥ 100:** Place neonatal NRM 1" from the baby's face | **blow-by O_2 10 L**
4. **If apneic| RR < 40 or ineffective breathing | HR ≥ 100**
   - **PPV/neonatal BVM at 40-60 BPM** (inspiratory time 1 s or less) on **ROOM AIR** Do not exceed peak inflation pressures of 20-25 cm H_2O (if measurable via BVM) First breath will require a little more pressure (30-40 cm H_2O) to begin lung inflation Assess adequacy of ventilation by a rise in HR and, less reliably, chest expansion.
   - Apply **peds SpO_2** to right upper extremity (wrist or medial aspect of palm)

Target 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) (Titrate O_2 delivery to SpO_2 readings if possible)

5. **If apneic/labored | RR < 40 | central cyanosis | HR 60-99: PPV** as above at **40-60/neonatal BPM + 15 L O_2**
6. **If HR <60 despite adequate PPV as above for 30 seconds:**
   - Continue PPV with 15 L O_2/neonatal BVM (avoid pressure over eyes) If adequate ventilation cannot be achieved by BVM**:** Go to **Peds Airway Adjuncts** SOP
   - **Begin chest compressions** over lower ⅓ of sternum; ~⅓ chest depth; using two thumbs (encircling hands around the chest) in a 3:1 ratio (90 compressions & 30 breaths for 120 total events per minute)
7. If **HR remains <60** 1 min after above: **Assess ECG rhythm** | **Vascular access** ASAP (IV/IO) NS TKO [ALS] **EPINEPHRINE** (1 mg/10 mL) **0.01 mg/kg** (0.1 mL/kg) IVP/IO

Epinephrine dosing | repeat q. 6 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 g/kg (5 mL/kg)			
2 kg = 10 mL	3 kg = 15 mL	4 kg = 20 mL	5 kg = 25 mL

8. **Assess heel-stick glucose:** Newlyborn hypoglycemia **= bG < 30 mg/dL |** Rx as above [ALS]
9. **If possible shock:** Consider need for IVF challenges: NS 10 mL/kg IV/IO over 5-10 min | May repeat X 1
10. **Adequate ventilations & HR:** Support ABCs; O_2 titrated to SpO_2 to reduce risks associated with hyperoxia

Note: Obtain 1 and 5 min APGAR scores | If 5 minute APGAR ≤ 6: assess additional scores q. 5 min until hospital arrival

OBSTETRICAL COMPLICATIONS

Time sensitive pt

BLEEDING IN PREGNANCY

Threatened miscarriage | Ectopic pregnancy | Placenta previa | Abruptio placenta

1. **IMC** special considerations:
   - **If > 20 wks gestation**: Position patient on side | Raise either side of backboard if SMR is necessary
     Manually displace uterus to side | Obtain BP while patient positioned on side if possible
   - **O_2** 12-15 L by tight fitting mask even w/o respiratory distress until $SpO_2 \geq 96\%$
     (Mom's 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 up to 1 L **titrated to patient response**
     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 | Collect/transport any tissue that is passed with patient
4. See notes on bleeding / shock in OB Trauma SOP

GESTATIONAL HYPERTENSION | PRE-ECLAMPSIA | ECLAMPSIA

Gestational HTN: Non-severe: SBP ≥ 140 and/or DBP ≥ 90 (in at least 2 readings taken at least 15 min apart by EMS) who had normal BP prior to 20 weeks and has no proteinuria | Severe HTN: SBP ≥ 160 and/or DBP ≥ 110 mmHg

PRE-ECLAMPSIA: New onset of HTN and proteinuria or the new onset of HTN and significant end-organ dysfunction with or without proteinuria after 20 wks gestation or within 6 weeks postpartum

May have any of these: Mod-severe fluid retention / edema, rapid wt gain (> 10 lbs in one week), new-onset and persistent headache not accounted for by alternative diagnoses and not responding to usual doses of analgesics; visual symptoms (blurred vision, flashing lights or sparks, diplopia, photophobia); pulmonary edema, confusion, irritability, AMS, severe, persistent RUQ/epigastric pain; nausea/vomiting

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
   - If AMS: Assess glucose level | Rx per Glucose Emergency SOP
   - Minimal CNS stimulation | Do **NOT** check pupillary light reflex
   - Lights and sirens may be contraindicated: Contact OLMC for orders
2. **Anticipate seizures**; prepare suction
   MAGNESIUM (50%) **2 g** in16 mL NS (slow IVP/IO) or in 50 mL NS (IVPB) over 10 min | Max 1 g / 5 minutes
   Begin on scene, continue enroute | Cover IV site with cold moist gauze or cold pack to relieve burning

ECLAMPSIA: Generalized tonic-clonic seizure during pregnancy with no other known cause

3. **MAGNESIUM** (50%) **2 g** in16 mL NS (slow IVP/IO) or in 50 mL NS (IVPB) over 10 min | Max 1 g / 5 minutes
   If patient received 2 g for preeclampsia prior to experiencing a seizure, may give an additional 2 g 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 max total dose of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated
   If chronic dx (HF); and/or on opioids or CNS depressants: ↓ total dose to 0.1 mg/kg

PEDIATRIC PATIENTS

Age definitions for purposes of these protocols			
Newly born: Up to 24 hrs	**Neonate**: 1- 28 days	**Infant**: 1- 12 months	**Child**: 1 to 12 years

Special considerations

- **Tailor assessments & interventions to each child** based on age, size, developmental, and metabolic status
- **Communication**: May be preverbal, nonverbal, or not know personal information. Age and developmental level influence responses to stressful events. Assess behaviors | Speak slowly/calmly (understandable words); don't yell
  Keep small child w/ caregiver if appropriate | May assess non-critical child while being held
  Child/adolescent may need to be interviewed without caregiver present to gain accurate information regarding drug or alcohol use, LMP, sexual activity, or abuse/trafficking | Have 2 EMS/LEO personnel present to witness statements.
  Fear: Use pacifiers, toys or penlight as distractors | Make a game of assessment | Kneel down to child's level if possible
  Young children may display negative behaviors (kicking/biting) due to fear or stress (May be age-appropriate behavior)
- **Respiratory:** Smaller airway diameter/shorter trachea | Infants < 6 mos obligate nose breathers | Resp arrest precedes cardiac arrest | Equipment needs vary based on pt height and weight
- **Shock:** Vigilant ongoing assessment | Children can maintain MAP until a 30% volume loss, then crash rapidly
- More susceptible to **infections, effects of chemical, biologic, and other agents and hypothermia:** Immature immune system; faster metabolism, faster RR; thinner skin/body surface area; shorter stature
  Cold stress & hypothermia lead to acidosis, hypoxia, bradycardia, hypoglycemia & cardiac arrest
- **Gastric distention** develops from crying and can lead to ventilatory impairment
- **Pain**: Be cautious in use of touch | Make as many observations as possible before touching and upsetting child
  Children do not localize pain well - defer painful part of exam to last if possible

PEDS ASSESSMENT / 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

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; POLST/DNR orders
   - **Universal blood/body secretion** & sharps **precautions**; use appropriate personal protective equipment (PPE)
   - **# 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
2. While walking up to the patient, inspect for the **Pediatric assessment triangle**:
   - **Appearance:** Awake/asleep/unresponsive | Age-appropriate behavior | **Interactiveness** | Abnormal **look**
     Abnormal **gaze** | Abnormal **speech/cry** | Irritable, **consolable or non-consolable**?
     Muscle tone: Good vs limp | Movement: spontaneous, purposeful, symmetrical | Sucking on a pacifier or bottle?
   - **WOB: Position:** Is pt sitting up or tripoding? Is arm/head position suggestive of SCI?
     Accessory muscle use | **Retractions**, nasal **flaring**, head bobbing, grunting | Abnormal **sounds** | **Apnea/gasping**
   - **Circulation to skin:** Pallor, mottling, cyanosis
   - Plus**:** Obvious injuries, bleeding, bruising, impaled objects or gross deformities | Detect odors
3. **PRIMARY ASSESSMENT/RESUSCITATION**: establish rapport with patient/significant others
   Determine if immediate life threat exists and **resuscitate as found**
   - **Determine size/weight:** Ask a reliable historian or use a current length/weight tape
   - **Level of consciousness** using AVPU or Peds GCS | Chief complaint S&S
     If unresponsive, apneic or gasping, & If NO central pulse OR pulse present but < 60 in infant or child with poor perfusion: Begin high quality CPR and Resuscitate per Cardiac Arrest SOP & appendix
     - **AIRWAY**: ✓Patency | Listen for audible airway noises, snoring, gurgling, stridor, wheezing, silence
     - Impaired? Reposition | **Suction** (size-appropriate catheter): limit 5 sec.| Monitor ECG (bradycardia)
     - **If obstructed**: See PEDIATRIC FOREIGN BODY AIRWAY OBSTRUCTION SOP
     - **If impaired**: See PEDS AIRWAY ADJUNCTS SOP
     - Initiate **SMR** if indicated | Vomiting/seizure precautions prn
   - **BREATHING/gas exchange/adequacy of ventilations**: Assess/intervene as needed:
     - General rate (fast or slow); rhythm | Compare to normal rate for age and situation
     - Air movement | Chest expansion (symmetry/retractions) | WOB (accessory muscle use)
     - If distress: quickly ✓ breath sounds: Present/diminished/absent, normal/abnormal; all lung fields
     - **If apnea:** See PEDS RESPIRATORY ARREST SOP

PEDS ASSESSMENT / INITIAL MEDICAL CARE

- **SpO_2** (before & after O_2 if able) if possible hypoxia, CR or neuro compromise | Normal ≥ 95%
  Unreliable w/ poor peripheral perfusion, CO poisoning | If abnormal; move sensor to central site -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 stimulus; poor skeletal muscle tone; or cyanosis

Correct hypoxia/assure adequate ventilations: Target SpO_2: ≥ 95%

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 PPV 1 breath every 3 to 5 seconds just to see visible chest rise

- **CIRCULATION / PERFUSION / HYDRATION / ECG**:
  - **Pulse**: General rate (consider activity & stress levels), quality, & regularity of central vs. peripheral pulses
  - **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 | breathing (normal or deep) | mucous membranes, skin turgor, tears when crying; urine output (# diapers)

If actual or potential cardiorespiratory (CR) compromise (See shaded box below):

- **Monitor ECG**. Use standard size electrodes / defib pads in children > 10 kg
  Use largest size that fits on chest w/o contact between pads | Prepare peds defib paddles if no pads
  Normal peds variants: PRI shorter | QRS wide if > 0.09 sec | T waves normally inverted V1-V3 up to 8 yrs
  Watch for conduction abnormalities in "normal" looking intervals / complexes in young children
  Peds 12 L ECG indications same as adult
  If ECG is run, attach/append to PCR/EHR left at, faxed or downloaded to, the receiving facility
- Rx **rate / rhythm / pump / volume / volume distribution disorders per appropriate SOP**
  Vascular access: Needs volume replacement and/or IV/IO meds
  0.9% NS | Catheter size, access site, & infusion rate based on pt size, hemodynamic status; SOP or OLMC
  IO: Same as adult + distal femur option | **If responsive**: **Lidocaine 0.5 mg/kg** (max 40 mg) slow IO
  IVF: If hypovolemic: **NS 20 mL/kg** up to 1 L in < 20 min based on MAP and mental status
  May repeat X 2 if MAP, HR, LOC, cap refill & S&S of perfusion fail to improve | Stop if S&S of fluid in lungs
  Do not delay transport in time-sensitive pts to establish elective IV/IO access on scene | Limit 2 attempts/route unless situation demands or OLMC order | May place peripheral line when moving; IO while stationary
  May use **central venous access devices** already placed based on OLMC

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

- Respiratory rate > 60 breaths/min
- Increased WOB | respiratory fatigue and/or failure
- HR: (Weak, thready, or absent peripheral pulses):
- Cyanosis or decreased SpO_2 despite O_2
- Poor perfusion, dysrhythmias; chest pain
- ≤ 8 years: < 80 BPM or > 180 BPM
- > 8 years: < 60 BPM or > 160 BPM
- Altered LOC (syncope, unusual irritability or lethargy or failure to respond to parents or painful procedures)
- Seizures
- Fever with petechiae
- Trauma
- Burns >10% BSA
- Post-exposure to toxic substance
- Hypoglycemia
- Severe acidosis

- **Disability**: Pupil size, shape, symmetry, reactivity; peds GCS (below); ability to move all four extremities
  If AMS or cardiac arrest - ✓ **bG** l If < 70: Rx per Peds Glucose Emergencies SOP
- **Expose** and examine as indicated | **E**nvironmental control: prevent hypothermia / keep warm

PEDIATRIC GLASGOW COMA SCORE

Eye Opening		Best Verbal Response						Best Motor Response	
Spontaneously	4	> 5 years Oriented/converses	5	2-5 years Oriented, words/phrases	5	< 2 years Coos, babbles; words	5	Moves purposefully; obeys commands	6
To sound	3	Confused	4	Confused	4	Irritable; cries; consolable	4	Localizes pressure/ withdraws to touch	5
To pressure	2	Words	3	Words/Persistent cry	3	Cries to pressure, inconsolable	3	Withdraws from pressure	4
None	1	Sounds	2	Sounds	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 PP; 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 OTC 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 ≤ 7 yrs or unable to communicate their pain: Observational scale such as FLACC (see appendix)
       Age 8-12 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**: Breathing w/ diaphragm only is normal up to 3 yrs | Abnormal S&S: Nasal flaring; grunting, head bobbing; see-saw breathing; assess normal, abnormal, adventitious lung sounds: stridor, wheezing, crackles
     - **Abdomen/pelvis/GU**/reproductive organs: Inspect contour, symmetry; discoloration; pain; changes in function; auscultate bowel sounds; palpate (light) for point tenderness, guarding/rigidity; 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 (see stroke screen); motor/sensory; balance/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. **Peds PAIN - See Pain Mgt SOP**: Non-pharmacologic options: parental presence, distraction, cold packs, Buzzy
   All should reflect a child-centered approach based on specific needs regardless of transport interval
   Consider pt status, responder scope of practice, risks/benefits of each strategy

   STANDARD DOSING for CHILDREN:

   ACETAMINOPHEN PO (See drug appendix) **| IV: If >2 yrs:** 15 mg/kg IV (max dose 750 mg) **IV pump required**

   FENTANYL: If > 2 yrs: 1 mcg/kg (See dose chart in appendix - 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

   KETAMINE 0.3 mg/kg slow IVP (over 1 min) or IN/IM. Max initial dose 50 mg slow IVP or infusion in 100 mL NS/LR. May repeat X 1 in 20 minutes (max cumulative dose 100 mg). See appendix for dosing chart.

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

PEDS INITIAL MEDICAL CARE cont.

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 meds
- Airway exam for loose teeth; large tonsils or anatomic airway abnormalities that may ↑ risk from sedating meds
- Clear understanding of medication actions, side effects, and drug interactions
- Appropriate training and skills in peds sedation and airway/ventilator mgt to allow rescue of the pt
- Age and size-appropriate equipment for airway mgt 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)

PEDS standard dose for midazolam for sedation/anxiety:

0.1 mg/kg slow IVP (0.2 mg/kg IN / IM) (Max single dose 2 mg). May repeat q. 2 min to
Max total dose < 6 yrs: 6 mg | 6-12 yrs: 10 mg titrated to size and age-appropriate VS & response

7. **Ongoing assessment**: Reassess VS, SpO_2, $ETCO_2$ (if AMS or sedative given) and pt responses to interventions. Every transported child should have at least 2 sets of VS.
   Stable: At least q. 15 min & after each drug/CR intervention; take last set 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, 2019) that requires children under age 2 years to be properly secured in a rear-facing child restraint system unless the child weighs ≥ 40 pounds or are ≥ 40 inches tall or per manufacturer's recommendations in contemporary child restraint devices. 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)** or appropriate **pediatric trauma center** (if indicated). 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 is present on scene and/or consents to release.

PALS 2020

Age	Normal SBP Ages 0-9 90 + (2 X age in yrs)	Diastolic BP	MAP	Hypotension	Heart rate	Resp rate
Neonate	67-84	35-53	45-60	<60	100-205	40-60
Infant 1-12 mos	72-104	37-56	50-62	<70	100-180	30-53
1-2 years	86-106	42-63	49-62	0-9 years: <70 + (2 X age in yrs)	98-140	22-37
3-5 years	89-112	46-72	58-69		80-120	20-28
6 -9 yr	97-115	57-76	66-72		75-118	18-25
10-12	102-120	61-80	71-79	<90	60-100	12-20

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, SpO_2 monitors, 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 ABCDEs**: Closely monitor airway, RR, HR & mental status. Support airway if difficulty handling oral secretions (severe cerebral palsy, mental retardation). Provide O_2 (or manual PPV) 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 **ADV airway** if in respiratory failure
7. **Vascular access** if IV meds or fluids needed. If chronic cardiac condition: IVF only per OLMC
   If hypoperfused: NS 20 mL/kg IVF bolus | If on anticoagulant, 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 inopressors (norepinephrine/epinephrine) for 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% of "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** of ≤ 2 L / 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 to move|
Hare traction contraindicated | Pad between stretcher straps & child | Drive cautiously; avoid sudden jolts that could cause a fx

Sickle cell disease:

- Vaso-occlusive crisis is very painful | Place warm compresses over swollen joints | OLMC orders for pain med
- Very susceptible to infection d/t malfunctioning spleen | ✓ for fever, abd pain | S&S of stroke = medical emerg.
- Vascular access challenging d/t frequent sticks | Give 20 mL/kg IVF bolus if S&S 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 (Age ≤12 yrs)

If BLS unsuccessful: May make 1 attempt at ADV airway per System procedure and local protocol.
Repeat attempt requires OLMC order.

1. **IMC:** SpO_2 and $EtCO_2$: evaluate before and after airway intervention; confirm patent IV/IO; ECG monitor
   Consider and Rx causes of obstruction; position, suction, manual maneuvers, medications for an allergic reaction, FB removal with direct laryngoscopy; attempt to ventilate w/ peds BVM
2. AMS & airway patent: **BLS airways**: Gag reflex present: > 4 yrs: NPA | No gag reflex (all ages): OPA
3. **If actual or potential impaired airway or inability to ventilate: Consider need for ADV airway**
   - Persistent airway impairment | Ventilatory failure (apnea, RR < 12 or > 40; shallow / labored effort; $SpO_2 \leq 94\%$ Increased WOB (retractions, nasal flaring, grunting) leading to fatigue
   - Inability to ventilate / oxygenate adequately after insertion of OPA / NPA and/or via BVM
   - Need for ↑ inspiratory pressure or PEEP to maintain gas exchange or sedation to control ventilations
4. **Position** patient for optimal airway access; may need to pad under shoulders/torso in small children
5. **Preoxygenate 3 minutes:** **Apply NC 6 L**; maintain during procedure – PLUS (if 2nd O_2 source available):
   IF RR ≥ minimum normal for age: O_2 12-15 L/(peds) NRM
   IF RR <12 or shallow: O_2 15 L/BVM every 3 to 5 sec. pressure & volume just to see chest rise (Target $SpO_2 \geq 95\%$)
6. **Prepare equipment**: Drugs & airway equipment per procedure)
   - Check **suction** source; attach rigid tip catheter | Select and prepare ADV airway and cricothyrotomy equipment per local protocol based on child's size, not chronological age

     Determine size/weight: Ask a reliable historian or use a current length/weight tape up to 35 kg

i-gel size	Patient Size	Pt wt (kg)	(LBS)	Broselow color	Suction size
1.5	Infant	5-12 kg	11-25	Pink, red, purple	10 Fr.
2	Small child	10-25 kg	22-55	Yellow, white, blue	10 Fr.
2.5	Large child	25-36 kg	55-79	Orange Green	10 Fr.

7. **If responsive to pressure and/or gag present: Sedation** (+ Pain mgt)**: KETAMINE** 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM (max 300 mg). Allow for response before insertion (if possible) | See notes on peds sedation in IMC

   Contraindications/restrictions to using sedatives: Coma with absent airway reflexes or known hypersensitivity/ allergy to drugs; consider need for BLS airways & BVM
8. **Place ADV Airway per procedure**: Maintain O_2 6 L/NC during procedure
   - Monitor VS, level of consciousness, skin color, $EtCO_2$, SpO_2 q. 5 min. during procedure
   - If HR < 60 or $SpO_2 \leq 94\%$: Pause & give 1 breath q. 3-5 sec w/ O_2 15 L//Peds BVM until condition improves
9. **Confirm ADV airway placement**
   - Ventilate and observe chest rise; auscultate over epigastrium, bilateral anterior chest, and midaxillary lines
   - Definitive confirmation: $EtCO_2$
10. **If successful:**
    - O_2 15 L/peds BVM: PPV every 3 to 5 seconds just to see chest rise
    - Secure airway with commercial device | Reassess $EtCO_2$ & lung sounds | Apply lateral head immobilization
    - **After 10 min:** Assess need for **postinvasive airway sedation and analgesia** (PIASA) **–** See Adult ADV Airway SOP
      In order of preference:
      KETAMINE (pain dose**)** 0.3 mg/kg slow IVP (pain relief + sedation) q. 15 min unless contraindicated OR
      MIDAZOLAM PEDS standard sedation dose + **FENTANYL** (standard dose) if restless/tachycardic (S&S pain)
      MIDAZOLAM: 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (Max single dose 2 mg). May repeat q. 2 min to
      Max total dose < 6 yrs: 6 mg | Max 6-12 yrs: 10 mg titrated to size and age-appropriate VS & response
    - Continue monitoring $EtCO_2$ & lung sounds to confirm adequacy of ventilations & tracheal placement
11. **If unsuccessful**: PPV with O_2 15 L/peds BVM | May repeat attempt X 1 based on OLMC order
12. **If ADV airway unsuccessful and good air exchange** w/ peds BVM: Continue BLS airways + PPV / BVM
    If unable to place ADV airway or adequately ventilate with BVM: Consider **cricothyrotomy**
    Children ≤ 12: Needle per SOP | Children 8-12 yrs: Surgical per OLMC only

If ADV airway placed & 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 until the object is expelled or child becomes unresponsive
   Infant < 1 yr: Repeated cycles of 5 back slaps followed by 5 chest compressions until object is expelled or child becomes unresponsive
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 (FB) 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 with chest compressions

ALS interventions:

4. Perform **laryngoscopy** (choking kit) if possible to inspect for FB | Remove w/ forceps or suction
5. **Still obstructed and unable to ventilate:** Treat per Peds IMC and Peds Airway Adjuncts SOPs
6. Consider **Cricothyrotomy**:
   - Per SOP: ≥13 yrs: Needle or surgical | ≤12 yrs: Needle
   - Per OLMC only: 8-12 yrs: Surgical
   - Transport; attempt to ventilate with 15 L O_2/BVM

PEDS RESPIRATORY ARREST

Time sensitive pt

Apnea with detectable cardiac activity

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: FB obstruction, respiratory illness, trauma, infection, submersion/drowning incident, poisoning/OD, or burn/smoke inhalation
   - If possible high spine injury: provide manual spine motion restriction while opening airway

Breathing resumes	Breathing not resumed - pulse present
2. Secure airway per Peds IMC; **O_2** 15 L/peds NRM	2. PPV (OPA & peds BVM): 1 breath q. 3 -5 sec (20-30 BPM) 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 opioid OD:**
   NALOXONE 0.1 mg/kg (max single dose 1 mg) **IVP / IO** [ALS] | IN / IM [EMR / BLS] w/ repeat doses q. 2 min until ventilations increase up to a total dose of 4 mg per EMS | Additional doses: OLMC
5. **Assess glucose:** If < 70 - Rx per Peds Glucose Emergencies 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
   - **Meets criteria for triple zero**: Do not resuscitate or move the body, notify law enforcement
   - **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 their initial grief reactions
   Be prepared for disbelief, denial, anger, guilt, confusion, anxiety, terror, sadness, crying, and/or hysteria
4. **Communicate with extreme empathy**: Be cautious about what is said to the parents/caretakers. In their grief, they may not understand with clarity, remember instructions, and may be very sensitive to any statements interpreted as implying causation, fault or blame. Give one clear instruction at a time; keep your words simple.

Brief Resolved Unexplained Events [BRUE]

An event in an infant < 1 yr when observer reports a sudden, brief, and now resolved episode of 1 or more 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 HPI/circumstances associated with event or symptoms: Severity, duration and 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 < 37 wks gestation | PMH of cardiac, neurologic, respiratory or chromosomal anomalies; GERD
4. Assess 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, $EtCO_2$, bG monitoring | Support ABCs per peds IMC | All should be transported to an EDAP/PCCC

PEDS ALLERGIC Reactions | ANAPHYLACTIC Shock

Allergic reactions have different mechanisms, triggers, clinical presentations, and vary widely in severity. Treat rapidly.

1. **IMC** special considerations: If ABCs compromised, go immediately to Rx
   - Repeat assessments for patent airway, airway edema; wheezing, respiratory effort & adequacy of perfusion
   - Ask about Hx of allergies / **Anaphylaxis Emergency Action Plan |** 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: (stinger, food, etc.)
   - 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: Isolated 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 ABCs stable/no airway compromise; BP WNL for child

S&S: Nasal congestion, sneezing, periorbital swelling, rash, itching, tearing

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

Likely allergen or other trigger | **S&S in 2 or more Systems occurring rapidly after exposure**

- **Skin/mucosal tissues**: Itching, flushing, generalized hives, swelling/edema
  Mouth/throat: Drooling, edema of the airways (lips, tongue, uvula, larynx, soft tissues); tongue/throat itching
- **Respiratory**: **Dyspnea**, cough, bronchospasm/ **wheeze**, stridor, hoarseness; chest tightness; hypoxia
- **GI** edema: Dysphagia, abdominal cramping/pain, diarrhea, nausea/vomiting

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

2. **EPINEPHRINE** (1mg/1mL): **< 25 kg** (**54 lbs**): 0.15 mg **≥** 25 kg (**55 lbs**): 0.3 mg **IM** (anterolateral thigh)
   May repeat X 1 in 5 min prn; **DO NOT DELAY TRANSPORT** waiting for a response [BLS]
3. If wheezing: **ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg** via HHN/mask. O_2 6 L/NC if SpO_2 ≤ 94% [BLS]
4. **DIPHENHYDRAMINE** 1 mg/kg (50 mg max) IVP | If no IV: IM | PO if no airway compromise or vomiting

CRITICAL: Severe SYSTEMIC Reaction/ANAPHYLACTIC SHOCK **Time sensitive pt**

Above + AMS, decreased/absent lung sounds; severely impaired airway; cardiovascular collapse: **HYPOTENSION for age;** dysrhythmias; faintness, syncope, or coma

2. **IMC** special considerations: (Resuscitate before ADV airway)
   - **EPINEPHRINE** (1 mg/1 mL):< 25 kg (**54 lbs**): 0.15 mg | ≥25 kg (55 **lbs**): 0.3 mg **IM** (anterolateral thigh) [BLS]
   - Attempt vascular access (IV/IO) after IM epinephrine
     If No IV / IO: May **repeat EPI** (1 mg/1 mL) **IM** dose q. 5 min prn to max total dose of 1 mg
     Additional doses: OLMC | **DO NOT DELAY TRANSPORT** waiting for a response
   - If **airway/ventilations severely compromised**: Rx per Peds Airway Adjuncts SOPs

As soon as vascular access is successful:

3. **IV NS fluid challenge 20 mL/kg IVP/IO** up to 1 L ASAP | Goal BP (MAP) adequate for age/size **| PLUS**
   EPINEPHRINE (1 mg/10 mL) **0.01 mg/kg** IV/IO **over 10 minutes** (See Drug Appendix for dose chart) |
   After 3 min may repeat X 1 to a **max total dose** [all routes] **1 mg |** Reassess after each dose | Addl. doses: OLMC
4. If wheezing: **ALBUTERO**L 2.5 mg (3 mL) **& IPRATROPIUM** 0.5 mg /HHN/mask or peds BVM [BLS]
   Add O_2 6 L/NC if SpO_2 ≤ 94%
5. **DIPHENHYDRAMINE** 1 mg/kg (max 50 mg) IVP/IO | If no IV/IO give IM [ALS]

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

- Give IVF as rapidly as possible (up to 20 mL/kg) (bolus fluids)
- **EPINEPHRINE** (1 mg/10 mL) **IV/IO per cardiac arrest SOP** (above dose limitation does not apply)

PEDS ASTHMA

1. **IMC** special considerations:
   - Evaluate ventilation ($ETCO_2$)/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: Needle pleural decompression per Chest Trauma SOP
   - **Airway/O_2 per Peds Airway Adjuncts SOP** 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; HR 100-125 (>5 yrs) or 120-140 (2 to 5 years) | RR 20-30 (>5 years) or 30 to 40; (2 to 5 years) | 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 | 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/1 mL)
   - Typical dosing: < 25 kg (**54 lbs**): 0.15 mg ≥ 25 kg (**55 lbs**): 0.3 mg **IM** (anterolateral thigh) [BLS]
   - 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 [BLS]
   Continue enroute | May repeat X 1 as needed

3 **If severe distress persists:**

MAGNESIUM (50%) **25 mg/kg** (max 2 g): in NS to total **20 mL in syringe** (slow **IVP**) or in **50 mL NS (IVPB**)
Give over 10 min - Max 1 g / 5 min. | Cover IV site with cold moist gauze or cold pack to relieve burning

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 – Assess:
   - Mental status: Alert, tired, restless to lethargic, responsiveness
   - Air entry (normal, mild delay, diminished) | lung sounds (clear, wheezes, crackles, diminished)
   - **S&S distress**: Grunting, nasal flaring, head bobbing, retracting, stridor; weak cry/inability to speak in full sentences
   - Color: Pallor, cyanosis, normal
   - **Oximetry**: Monitor SpO_2 for hypoxia | $EtCO_2$ for ventilatory/perfusion/metabolic deficits
   - **ECG** for changes in HR | Bradycardia signals deterioration
   - **Hydration** status (+/- sunken eyes, delayed cap refill, moisture of mucus membranes, fontanelles)

   If airway impaired/ventilatory distress: Rx per Peds IMC & Peds Airway Adjuncts SOPs
   Do NOT attempt NPA/OPA, intubation, glottic visualization, or vascular access unless CR collapse
   Avoid agitation: Hold upright in position of comfort | Transport in sitting position if possible

CROUP: Caused by many viruses including Covid-19

Emergent-Critical: Time Sensitive pt

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

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

2. Nebulize **EPINEPHRINE** (1 mg/10 mL) **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 w/ 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 CR compromise: No cyanosis, effective air exchange

2. Peds IMC only: Sit up; anticipate rapid deterioration; be prepared for below

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

2. Nebulize **EPINEPHRINE** (1 mg/10 mL) **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. **Continued inadequate ventilations/oxygenation:** Position to optimally open airway | O_2 / high flow NC / mask
   Ventilatory failure: PPV 15 L O_2 / Peds BVM at age-appropriate rate using slow compressions of bag
   Unable to ventilate: Temporarily stop ambulance | Rx per Peds Airway Adjuncts SOP | Least invasive way possible
   Be prepared for airway status to worsen after unsuccessful ADV airway attempt

Respiratory Syncytial Virus (RSV)/Bronchiolitis: Child < 2 w/ S&S of **bronchiolitis** or pneumonia

Early S&S like a 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 CR compromise: Peds IMC only; anticipate rapid deterioration

CRITICAL: Moderate to severe CR compromise:

Bradycardia, AMS, marked ventilatory distress, retractions, ineffective air exchange, and/or actual or impending respiratory arrest

2. Nebulize **EPINEPHRINE** (1 mg/10 mL) **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. **Continued inadequate ventilations/oxygenation:** Position supine in sniffing position | O_2 / high flow NC / mask
   Ventilatory failure: PPV 15 L O_2 / Peds BVM at age-appropriate rate using slow compressions of bag
   Unable to ventilate: Temporarily stop ambulance | Rx per Peds Airway Adjuncts SOP | Least invasive way possible

PEDS BRADYCARDIA with a PULSE

Possible contributing factors

- Hypoxia or ventilation problem
- Hypovolemia
- Hydrogen ion (acidosis)
- Hyper/hypokalemia & metabolic disorders
- Hypoglycemia
- Hypothermia
- Toxins/poisons/drugs
- 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 (bG)**: If < 70: Rx per Peds Glucose Emergencies 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 | 12 L ECG | Identify & Rx underlying causes

EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise

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

Time sensitive pt

2. **IMC special considerations cont.**
   - **Airway/ventilations**: Peds ADV Airway SOP if unconscious and unresponsive to pain
   - Initiate **CPR** if HR < 60 in infant/child and poor systemic perfusion despite O_2 and ventilation
   - **IV / IO NS** TKO | If S&S of hypovolemia: **NS 20 mL/kg IVP/IO**; may repeat X 2 prn
   - ECG monitoring; 12-lead ECG

   Assess HR & ECG after each fluid bolus or drug: Proceed only if bradycardia & hypoperfusion persist
3. **EPINEPHRINE** (1 mg/10 mL) **0.01 mg/kg** (0.1 mL/kg) **up to 1 mg** IVP/IO q. 6 min prn to **SBP >** 70 + (2 X age in yrs)

If bradycardia is due to ↑ vagal tone (ADV Airway attempts), primary AV Block, cholinergic drug toxicity, or persists after epi:

ATROPINE 0.02 mg/kg rapid IVP / IO (See dose chart in Appendix)
Contraindications: 2˚ Mobitz type II or 3˚ AVB w/ wide QRS; abnormal function of SA node; transplanted heart

- Single dose range: 0.1 mg to 0.5 mg
- May repeat X 1 in 5 min to a **Max total dose** of **1 mg**

Transcutaneous cardiac pacing: If drugs are ineffective or contraindicated | **No IV/IO placed** and impending **hemodynamic collapse**, start **PACING** per procedure **while prepping meds** (contraindicated in severe hypothermia)

3. Start at age-appropriate HR & lowest mA that achieves electrical + mechanical capture unless contraindicated
   Pacing is 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 > 10 kg
   Assess need for sedation and pain management as below

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

Sedation: MIDAZOLAM 0.1 mg/kg slow **IVP (0.2 mg/kg IN / IM)** (Max single dose 2 mg) | May repeat q. 2 min to Max total dose < 6 yrs: 6 mg | 6-12 yrs: 10 mg titrated to size and age-appropriate VS & response

Pain: ≥ 2 yrs and not contraindicated: **FENTANYL:** Standard dose for pain (Peds IMC, appendix) OR
KETAMINE: Standard dose for pain (Peds IMC, appendix)

PEDS NARROW QRS COMPLEX TACHYCARDIA

QRS Children > 3 years QRS complex narrow if (≤0.09 sec) and wide if (>0.09 sec).

Search for and treat possible contributing factors/underlying cause:

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

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: HR usually < 220 BPM	• Infants: HR usually > 220 BPM
• Children: HR usually < 180 BPM	• Children: HR usually > 180 BPM

Clinical presentations:

- Cardiorespiratory (CR) 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 cardiac output and shock develop

1. **IMC** special considerations:
   - NO CR compromise: Assess and support ABCs; O_2 if SpO_2 < 95% or SOB
   - ECG monitor; 12-L ECG if available and condition permits (do not delay emergent Rx)
   - IV or IO access: Defer vascular access until after cardioversion if unconscious
   - If hypovolemic: **NS fluid bolus 20 mL/kg IVP** followed by reassessment

Lower Acuity to EMERGENT: Mild to Moderate CR 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** per procedure (Monitor ECG)
3. **ADENOSINE 0.1 mg/kg (**Max 6 mg**) rapid IVP** | follow w/ 5 mL NS flush
   2nd dose: 0.2 mg/kg (Max 12 mg) rapid IVP | follow w/ 5 mL NS flush
4. If rhythm improves but continued hypoperfusion: Refer to shock SOP
   If no rhythm improvement: Proceed to severe CR compromise

CRITICAL: SEVERE cardiorespiratory compromise:

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

Time sensitive pt

2. **IMC** special considerations in conscious patient:
   - If IV/IO placed: May give brief trial of meds while preparing for cardioversion | See above
   - If responsive: **MIDAZOLAM 0.1 mg/kg** slow **IVP** (0.2 mg/kg IN/IM) (**Max single dose 2 mg**) | May repeat q. 2 min to max total dose < 6 yrs: 6 mg | 6-12 yrs: 10 mg titrated to size and age-appropriate VS & response
     OR **KETAMINE** sedation dose | If condition is deteriorating, omit sedation
3. **Synchronized CARDIOVERSION at 0.5 - 1 J/kg** up to adult max joules (See chart p. 108)
   If delays in synchronization and condition critical, go immediately to unsynchronized shocks
4. **Cardioversion successful:** Support ABCs; observe
   Cardioversion unsuccessful: Synchronize cardioversion at **2 J/kg up to adult max joules**:
   QRS regular: 50-100 J; QRS irregular: 120-200 J
   Re-evaluate rhythm & possible causes (metabolic or toxic) | Rx possible causes

PEDS WIDE COMPLEX TACHYCARDIA with Pulse

Rate > 120 - (QRS 0.10 sec or longer) – VT; SVT with aberrancy, WPW; Torsades de pointes

Search for and treat possible contributing factors:

- Hypoxemia
- Hypoglycemia
- Hypovolemia/dehydration
- **Hypo**thermia
- Hydrogen ion (acidosis)
- Hyper/hypokalemia
- Tamponade, cardiac
- Tension pneumothorax
- Toxins/poisons/drugs
- Thrombosis/thromboembolism
- Pain
- Congenital heart disease
- Cardiomyopathy, myocarditis
- Prolonged QT syndrome.

1. Uncommon: Assess for hypoperfusion, CR 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 ADV airway management
   - Obtain, review and transmit 12 lead ECG; **determine rhythm & stability ASAP**
   - If unconscious, defer IV until after cardioversion
   - Apply appropriate size defib pads if available or prepare peds defib paddles
   - Assess ECG 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) in NS to total volume of **20 mL** (slow **IVP) or in 50 mL** NS **(IVPB)** over 20 min | Complete dose even if rhythm converts	3. **MAGNESIUM** (50%) **25 mg/kg** (max 2 g) in NS to total **20 mL in syringe** (slow **IVP**) or in **50 mL NS (IVPB**) | Give over 10 min - Max 1 g / 5 min. | Cover IV site with cold moist gauze or cold pack to relieve burning

CRITICAL: SEVERE cardiorespiratory compromise:

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

Time sensitive pt

3. **IMC** special considerations
   - If IV/IO placed: May give brief trial of meds while preparing for cardioversion | See above
   - If responsive: **MIDAZOLAM 0.1 mg/kg** slow **IVP** (0.2 mg/kg IN/IM) (**Max single dose 2 mg**) | May repeat q. 2 min to max total dose < 6 yrs: 6 mg | 6-12 yrs: 10 mg titrated to size and age-appropriate VS & response
     OR **KETAMINE** sedation dose | If condition is deteriorating, omit sedation
4. **Monomorphic VT:** Synchronized **CARDIOVERSION at 0.5 – 1 J / kg** (**See chart p. 108**)
   All polymorphic VT / Torsades de pointes: **DEFIBRILLATE** at 0.5 - 1 J / kg
   If delays in synchronization and condition critical, go immediately to unsynchronized shocks up to adult max joules
   HR generally > 220 before cardioversion necessary in children
   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 in syringe or in 50 mL (IVPB)
     Give **slow IVP** or **IVPB** over 20 min.
   - **Synchronized cardioversion at 2 J / kg** after ½ of the amiodarone dose
   - Complete amiodarone even if patient converts after shock delivery if BP is normal for age

PEDS ALTERED MENTAL STATUS

AMS: Consider possible etiologies; use appropriate SOPs

- **A**: Alcohol and ingested drugs/toxins; ACS/HF, arrhythmias, anticoagulation; acid-base imbalances (acidosis/hypercarbia)
- **E**: Endocrine/exocrine (thyroid/liver/pancreas/adrenals); F&E imbalances; ECG abnormalities/dysrhythmias: 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), opioids, OD, occult blood loss (GI/GU)
- **U**: Uremia; other renal causes including hypertensive problems
- **T**: (recent) Trauma, temperature changes
- **I**: Infections (neurologic and systemic); infarction
- **P**: Psychological; (massive) pulmonary embolism
- **S**: Space occupying pathology (epi or subdural, subarachnoid hemorrhage, tumors); stroke, sepsis, shock, seizures, SUD

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 | **Insight**
- Memory deficits; speech patterns
- Inspect for Medic alert jewelry, tags, body art
- Consider vulnerability factors: functional impairment, malnutrition, substance use disorder
- General appearance; odors on breath; evidence of alcohol/drug use; trauma
- VS: 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
- Pain: Facial expression, body movements, muscle tension, vocalization; FLACC for Peds

1. **IMC** special considerations:
   - Suction cautiously prn; seizure/vomiting/aspiration precautions
   - GCS ≤ 8: Rx per Peds Airway Adjuncts SOP
   - If SpO_2 < 95%: O_2 and PPV per Peds IMC
   - If SBP < 70 + (2 X Age): **IV NS** 20 mL/kg IVP | May repeat X 2 if indicated
   - Position patient on side unless contraindicated | Suspicion of spine trauma: SMR
   - 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 Peds GCS, VS, oximetry, ECG, and neuro exam
2. Obtain and record **glucose level**
   - If < 70: Rx per Peds Glucose Emergencies SOP | Observe/record response; recheck bG level
   - If ≥ 70: Observe and continue to assess patient
3. If possible **opioid toxicity** w/ AMS and slow RR for age / respiratory arrest | May not have small pupils:
   NALOXONE 0.1 mg/kg (max single dose 1 mg) **IVP/IO** [ALS] | IN/IM [EMR / BLS] w/ repeat doses q. 2 min until breathing adequate up to 4 mg per EMS). Additional doses: OLMC. See Drug Appendix for dosing chart.

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

Syncope: Loss of consciousness and loss of postural tone | Abrupt in onset, resolves quickly
Risk factors for adverse outcomes: Older age, structural heart disease, history of CAD

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

PEDS DRUG OVERDOSE | POISONING

Case by case determination if time sensitive

GENERAL APPROACH

1. **History**: PMH of SUD? Determine route: ingestion, injected, absorbed, or inhaled; pts often unreliable historians.
2. **IMC** special considerations:
   - Uncooperative behavior may be due to intoxication/poisoning; assess for underlying pathology
   - Anticipate hypoxia, hypercarbia, respiratory and/or cardiac arrest, hyper or hypotension, dysrhythmias, vomiting, seizures, AMS, coma | **Monitor ECG, SpO_2 and $EtCO_2$ in all pts with AMS or given sedatives**
   - Assess need for Adv. airway if GCS ≤ 8; aspiration risk, airway compromised. See 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 if AMS, tachycardic, bradycardic, hypotensive; or HR irregular
   - Impaired pts should be treated and transported. Call OLMC if parent/guardian wishes to refuse transport
3. If AMS, seizure activity, or focal neurologic deficit: ✓ **glucose level |** If < 70: Rx per Peds Glucose Emergencies SOP

STANDARD DOSING GUIDELINES: See dosing charts in Appendix
If additional doses appear needed: Contact OLMC

Possible opioid toxicity w/ AMS + resp. depression/arrest: NALOXONE **0.1 mg/kg** (max single dose 1 mg) IVP/IO [ALS] IN/IM [EMR/BLS]. May repeat q. 2 min until breathing adequate (max total dose 4 mg per EMS)

Anxiety/serotonin syndrome: IF SBP ≥ 70 + (2X age) or if ≥10 yrs: SBP ≥ 90:
MIDAZOLAM 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (max single dose 2 mg) | May repeat q. 2 min to a **max total dose** < 6 yrs: 6 mg | 6-12 yrs: 10 mg titrated to size and age-appropriate VS and response

Tonic-clonic seizures: **MIDAZOLAM** 0.1 mg/kg IVP/IO (0.2 mg/kg IN/IM) (Max single dose 2 mg) | May repeat q. 30-60 sec up to a **max total dose of** < 6 yrs: 6 mg | 6-12 yrs: 10 mg based on size and titrated to stop seizure

Violent/combative/undifferentiated delirium w/severe agitation: Carefully estimate weight
KETAMINE SEDATION DOSE: 2 mg/kg slow IVP/IO (over 1 min) or 4 mg/kg IN/IM (not to exceed 300 mg by SOP)
Recommended approach: Combination of doses/routes to achieve desired sedation within max dose by weight
- Up to 50 mg (1 mL) each nostril IN (unless contraindicated) may repeat within 90 seconds AND/OR
- Up to 150 mg (3 mL) IM (may use both anterolateral thighs through clothing prn)

Use caution in pts with active psychosis | Frequently monitor/document mental status, VS, SpO_2, $EtCO_2$, ECG

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

4. If ↓ BP: Limit fluid boluses to 5-10 mL/kg; reassess after each bolus due to high freq. of heart dysfunction
5. If P < 60 + SBP < 70 & unresponsive to drugs & pacing per Peds Bradycardia w/ Pulse SOP:
   GLUCAGON IV/IO [ALS] IN/IM [BLS] **< 20 kg (44 lbs)**:0.5 mg **≥ 20 kg (45 lbs)**:1 mg

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

4. IF ↓ BP: **IV NS** fluid challenge **10 mL/kg IVP/IO**(to offset alpha blockade). May repeat until BP stable.
5. **SODIUM BICARB 1 mEq/kg IVP** (max 50 mEq). Repeat X1 if ↓ BP, AMS, wide QRS persists, or dysrhythmias

DEPRESSANTS: DEPRESSANTS: Barbiturates: Phenobarbital, Seconal (secobarbital) I **Benzodiazepines:** diazepam (Valium), midazolam (Versed), lorazepam (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

4. 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).

4. 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).
5. Treat sodium channel blockade toxicity with **SODIUM BICARBONATE** (See cyclic antidepressants)

PEDS DRUG OVERDOSE | POISONING cont.

Case by case determination if time sensitive

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

4. 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.

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

OPIOIDS: *Codeine, fentanyl* (carfentanil, Duragesic, Sublimaze, Actiq); *heroin*, *hydrocodone* (Vicodin, Norco, Lortab, Lorcet); *hydromorphone* (Dilaudid, Exalgo, Opana ER); *meperidine* (Demerol); *methadone* (Dolophine, Methadone, 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

4. If AMS + RR slow for age (pupils may or may not be small): **NALOXONE standard dose** (top previous page)
5. Assess need for restraints; monitor for HTN after opioid is reversed if speedballs are used

ORGANOPHOSPHATES (cholinergic poisoning):
Insecticides: Malathion, parathion, diazinon, fenthion, dichlorvos, chlorpyrifos, ethion | **Antihelmintics**: Trichlorfon
Nerve gases: Soman, sarin, tabun, VX | **Ophthalmic agents**: Echothiophate, isofluorphate | **Herbicides**: Tribufos (DEF), merphos

S&S: **"SLUDGEM"** reaction (salivation, lacrimation, urination, defecation, GI distress, emesis, miosis (pinpoint pupils) + **Killer Bs**: Bronchorrhea, Bronchospasm, Bradycardia (muscarinic). Tachycardia may occur with nicotinic toxicity.

4. Remove from the contaminated area; decontaminate as much as possible before moving to the ambulance
5. **ATROPINE 0.02 mg/kg (minimum 0.1 mg) rapid IVP/IM**: Repeat q. 3 min until improvement (reduction in secretions) The 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

4. 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.
5. **If anxiety, seizures, serotonin syndrome &/or HTN crisis**. **MIDAZOLAM** standard dose
   If violent, combative, uncooperative, delirium w/severe agitation **KETAMINE** standard sedation dose
6. If hallucinations: quiet environment devoid of stimulation (lights, noise and touch)

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

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. **IMC** special considerations:
   - Obtain PMH; ask about history of diabetes (type 1 or 2) | Type 2 incidence is rising in children
   - Assess for presence of automated insulin delivery (AID) systems; glucose monitoring devices
   - Determine general compliance, time and last dose of medication prescribed for diabetes mgt, and last oral intake
   - Vomiting and seizure precautions: prepare suction
   - Obtain/record **blood glucose (bG) level** (heel stick ≤12 mos) if S&S hypo or hyperglycemia
     Reference ranges: Neonates > 3 days to adults: Fasting: 70-99 mg/dL Non-fasting: 70-139 mg/dL

S&S Hypoglycemia	
Mild:	Pallor; diaphoresis; shakiness; weakness, fatigue; hunger, anxiety, nervousness, irritability, difficulty concentrating; HA; dizziness; numbness, tingling around mouth and lips; nausea, rapid HR, palpitations
Moderate	Irritability, agitation, confusion; ataxia; weakness/hypotonia; difficulty speaking or slurred speech
Severe	Lethargy, confusion to coma; seizures; inability to swallow; cold limbs/hypothermia

Blood Glucose ≤ 70 or S & S of hypoglycemia

Hypoglycemic pts with AMS are considered nondecisional. When hypoglycemia is corrected and confirmed by a repeat bG reading, they can be re-assessed for parent/guardian's ability to refuse further care/transport.

2. **[BLS] If GCS is 14-15 and able to swallow safely** (+ gag reflex)**: 0.3 g/kg (up to 15 g)** of a rapidly-absorbed **oral carbohydrate** if available. May repeat in 15 minutes. Options include (not limited to) any one of the following:
   - Glucose tablets (5 g per tablet) | Glucose gel (15 g per tube)
   - Sweetened fruit juice: 12 g carbs / 4 oz (120 mL) | Regular soda (not diet): 18 g carbs / per 6 oz (180 mL)
   - Honey: 17 g carbs / 1 T (15 mL) | Granulated sugar: 12.5 g sugar / 1 T
3. **[ALS] If AMS & cannot swallow safely | Infants and Children (up to 50 kg or 110 lbs)**
   DEXTROSE 10% (25 g/250 mL) **0.5 g/kg up to 25 g** (5 mL/kg). See dosing chart in appendix.
   For smaller children, draw up desired volume into a syringe and administer slow IVP
   If S&S of hypoglycemia fully reverse and pt becomes decisional after a partial dose, reassess bG
   If >70; close clamp to D10% and open NS TKO

   If bG is borderline 60-70 and symptomatic: Give ½ of the dose as listed above

   Approved alternative if D10% unavailable: **D25%**:(0.25 g/mL) 2 mL/kg up to 25 g
4. **Assess patient response 5 min after dextrose administration**: Mental status (GCS) and bG level
   If ≥70: Ongoing assessment
   If <70: Repeat **D10%** 0.5 g/kg (5 mL/kg) in up to 5 g (50 mL) increments at 5-10 minute intervals
   Reassess bG and mental status 5 min after each increment
5. If no IV/IO: **GLUCAGON** IN/IM [BLS] **< 20 kg (44 lbs)**: 0.5 mg | **≥ 20 kg (45 lbs.)**: 1 mg in anterolateral thigh [BLS]
6. If parent/guardian refuses transport, advise them to feed child before EMS leaves & call child's PCP to report incident

DIABETIC KETOACIDOSIS (DKA) (CRITICAL)

Time sensitive pt

Pts may be hyperglycemic and NOT be in DKA. They must present with the following.

- **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

2. **IMC** special considerations: EMS personnel shall not assist any patient in administering insulin
   - Monitor ECG for dysrhythmias and changes to T waves
   - **IV NS 10 mL/kg IV/IO** over 1 hour unless S&S of hypovolemic shock or OLMC increases the volume to 20 mL/kg
     Child may have large fluid deficits; auscultate lung sounds after each 50 mL
   - Maintain SBP at or above age-appropriate minimum; monitor for development of pulmonary and cerebral edema

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); ↑ ICP (shunt placed?)
- **Toxin**/intoxication (cocaine, cyclic)
- Epilepsy; tumor

Secondary assessment: Observe and record the following

- **Seizure description**: presence of an aura, focus of origin (one limb or whole body), simple/complex (conscious or loss of consciousness); partial/generalized; progression and duration; eye deviation prior to or during seizure; incontinence; or oral trauma; or abnormal behaviors (lip smacking)
- 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:**
   Benzodiazepine administration takes precedence over bG determination in pts who are actively seizing
   MIDAZOLAM 0.1 mg/kg IVP/IO (0.2 mg/kg IN/IM) (Max single dose 2 mg) q. 30-60 sec up to a **max total dose of** <6 yrs: 6 mg | 6-12 yrs: 10 mg based on size and titrated to stop seizure
   If seizures persist: Contact OLMC for additional dosing
3. Identify and attempt to correct reversible precipitating causes (see above)
   ✓ **blood glucose**: If < 70: Rx per Peds Glucose Emergencies SOP

Febrile seizures: Most common seizure disorder in childhood between 6 to 60 months. Defined as brief (< 15-min) generalized seizure that occurs once during a 24-hr period in a febrile child who does not have an intracranial infection, metabolic disturbance, or Hx of afebrile seizures.

- Assess hydration | If dehydrated, may attempt IV X 1
  If successful: NS 20 mL/kg IVP
- Reassure/calm child and parents/caretakers
- Passively cool by removing all clothing but diaper/ underwear | Cover lightly | Do not induce shivering
  Temp may rebound and may cause another seizure
- NPO (Anti-fever med per 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 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
- If already given by others: 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 sec to ≥5 min.
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 X/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 SEPSIS and SEPTIC SHOCK

Time sensitive pt

1. **IMC special considerations:**
   - **INFECTION:** Rapidly assess for risk factors | S&S suggesting infection* | Infectious source - If YES
   - **SpO_2**: Use central sensor if pt has poor peripheral perfusion (cold hands)
   - Assess **$EtCO_2$** - Correlations
     $EtCO_2 \leq 31$ = Lactate 2 | Suggests hyperventilation; poor perfusion; and/or metabolic acidosis
     $EtCO_2 < 25$ = Lactate ≥ 4 (metabolic distress)
   - If above present: **Assess for peds qSOFA criteria:** Note if ≥ 2 criteria are present
     Neuro: AMS (GCS <15); assess for disorientation/agitation and/or > 1 pt below patient's GCS baseline
     Respiratory distress (↑increased WOB)
     Cardiac: Capillary refill ≥ 3 sec | weak radial pulse | severe tachycardia
   - **Assess S&S of fluid deficit:** Orthostatic VS changes if not hypotensive**;** poor skin turgor, dry mucosa
     Vascular access & IVF- See below
   - ✓ **blood glucose:** Anticipate hyper or hypoglycemia | Rx per Peds Glucose Emergencies SOP

Warm stage	(6-24 hrs): ↑ RR; hyperdynamic phase with high cardiac output; SBP 25% < normal; fever, vasodilation, skin: hot, dry, flushed
Cold Stage	(ominous/late): AMS; T < 96.8° F; skin cold; mottling; ↑ HR & RR; profound hypotension

***Indicators suggesting infection:**

Fever; warm skin	Fatigue, altered mental status	Cough, dyspnea	Sore throat, ear ache
Diarrhea	Dysuria, foul smelling/cloudy urine	Local redness, warmth, swelling, unhealed wounds etc.	

If infection, no sepsis: CR support and Rx specific conditions per appropriate SOP or OLMC

SEPSIS: Suspect infection + $EtCO_2 \leq 31$ + ≥ 2 peds qSOFA criteria: **SBP > 70 + (2 X Age)**

2. Call OLMC with a **Sepsis alert** per local policy/procedure
3. **NS IV** to maintain SBP (MAP) at least normal for age/size (max 1 L)

SEPTIC SHOCK: Sepsis + SBP <70 + (2X Age) or hypotensive for pt; **$EtCO_2$ likely < 25**

2. Call OLMC with a **Sepsis alert** per local policy/procedure
3. Improve perfusion: IV/IO **NS 20 mL/kg** bolus to SBP > 70 + (2 X Age) or normal for child
   Reassess VS/skin signs / $EtCO_2$ q. 5 minutes to assess fluid responsiveness and S&S of volume overload
4. **If hypotension persists – add inopressor while continuing IVF** (2nd IV line while IVF continues in 1st)
   NOREPINEPHRINE 0.1 mcg/kg/min IVPB/IO (max 1 mcg/kg/min up to 8 mcg/min) titrated to SBP >70 + (2X Age)
   Retake BP every 2 min until desired BP is reached (don't overshoot), then every 5 min
   Maintenance: Titrate drip downward just to maintain target BP (MAP) | Option: Alternate approved inopressor
   Keep fingers on pulse & watch SpO_2 pleth on monitor for 5 min to detect PEA

At risk populations: <1 yr, or weakened immune systems (cancer, HIV/AIDS); indwelling devices; chronic steroid use; sickle cell disease, splenectomy; bedridden or immobile; recent trauma, surgery, or dental work; breached skin integrity (wounds, burns); IV drug use; post-organ transplant; chronic disease: DM, cirrhosis, autoimmune, renal

Results in a systemic immune/**inflammatory response leading to massive vasodilation and capillary leak** that causes hypoperfusion. Other concerns: **Hypercoagulability** (petechiae); mottling.

May be sicker than they look – Consider shock index: tissue hypoxia and acidosis begins BEFORE ↓ BP

PEDS INITIAL TRAUMA CARE (ITC)

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; WOB; circulation to the skin
2. **Determine if immediate life threat exists |** Resuscitate as found
3. **Level of consciousness:** AVPU or peds GCS; chief complaint S&S
4. **Sequencing priorities** if exsanguinating hemorrhage: **MARCH** (See Adult ITC) - Hemorrhage control first

   AIRWAY/SPINE: Snoring, gurgling, stridor, silence | Consider possible spine injury
   - Open/maintain using position, suction, adjuncts & manual SMR prn (Peds Airway Adjunct SOP)
   - Once airway controlled: Apply appropriate size c-collar + SMR if indicated | If backboard used: Position child < 2 yrs supine w/ a recess for head or pad under back from shoulders to buttocks
   - Vomiting/seizure precautions prn
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, CR or neuro 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: 95%-100%
   - **Oxygen 1-6 L/NC**: Adequate rate/depth; minimal distress | RA SpO_2 92-94%
   - **Oxygen 12-15 L/NRM:** Adequate rate/depth; mod/severe distress; S&S hypoxia, or per protocol
   - **Oxygen 15 L/ BVM:** Inadequate rate/depth; mod/severe distress; unstable
     PPV at 1 breath every 3 to 5 seconds | Avoid hyperventilation
   - If suspected **tension/open pneumothorax or flail chest → 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 SOP | Quality CPR (appendix) | Appropriate SOP for rhythm/condition
   - Assess **bleeding** type, amount, source(s) and rate | **Hemorrhage control** per System procedure:
     - **Direct pressure**; pressure dressings to injury - If direct pressure ineffective or impractical:
     - Pack & press wound w/ **hemostatic gauze;** frequently ✓ for bleeding
     - Limb w/ uncontrolled bleeding: **Tourniquet | Pelvic fx**: Wrap w/ pelvic binder or in upside down KED
   - If suspected **cardiac tamponade, blunt aortic or cardiac injury → Chest Trauma SOP**
   - **Vascular access:** Actual/potential volume replacement and/or IV meds prior to hospital arrival
     IV 0.9% NS (warm): Catheter size & infusion rate per pt size, hemodynamic status, SOP or OLMC
     IO: Urgently needs IVF/meds & IV impossible | If responsive: **LIDOCAINE** 0.5 mg/kg (max 40 mg) slow IO
     Limit 2 attempts/route unless situation demands/OLMC order

     Volume: If in shock: NS 20 mL/kg IVP/IO (up to 1 L) in < 20 min based on MAP and mental status
     Repeat X 2 if hypoperfusion persists | Do not exceed BP targets | Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome
     - **Timing**: Do not delay transport in critical pts to establish elective vascular access on scene
       May place peripheral line when moving; IO while stationary
     - May use **central venous access devices** already placed based on OLMC
   - **Monitor ECG** if actual or potential CR 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: ✓ **bG** | If < 70: Rx per Peds Glucose Emergencies SOP
8. **Pain mgt** Rx per **PAIN Mgt and Peds IMC** SOP | **Nausea**: **ONDANSETRON** standard dose per Peds 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 time ≤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 spine motion restriction if indicated - see SCI SOP

1. Obtain **baseline VS**: BP (MAP if able - correct cuff size) – Obtain 1st BP manually; trend pulse pressures
   Pulse: rate, quality, rhythmicity | Respirations: rate, pattern, depth | Temp if indicated
   SAMPLE history: OPQRST of CC/pain using appropriate pain scale consistent with the pt's age, condition, and ability to understand
   Allergies (meds, environment, foods) | **Medications** (prescription/OTC – 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, SUBQ emphysema, c- spines; may temporarily remove anterior c-collar to assess neck
   - **CHEST:** Lung/heart sounds
   - **ABDOMEN**: Signs of injury/peritonitis by quadrant: contour, visible pulsations, wounds/bruising patterns, pain referral sites, localized tenderness, guarding, rigidity; 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; SUBQ emphysema
3. **Ongoing assessment**: Reassess VS and responses to interventions. Every transported pt should have at least 2 sets of VS at least q. 15 min & after each drug/CR intervention; take last set 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 per procedure** Hx and physical exam findings; Pediatric Trauma Score
6. **All refusals must have OLMC contact** per System policy even if parent /guardian consents to release
7. **Handoff Report:** An EMS "time-out" to allow for an uninterrupted report at receiving facility is useful to ensure continuity of care especially if complete written/electronic ePCRs/EHRs are not available at time of pt handoff.

PEDIATRIC TRAUMA SCORE: Age 12 and under

Component	+2	+1	-1	Score
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	
Total Score (-6 to +12): **A PTS of < 8 usually indicates the need for evaluation at a Trauma Center.**				

Considerations: Higher risk for injury, irreversible shock, and death from traumatic events
Rib cage more pliable, abdominal muscles thin/less developed | larger head/higher center of gravity | smaller blood volume

All Pediatric Systems Trauma Peds ITC; Rx. seizures per Peds Seizure SOP
See adult SOPs for specific injury interventions

SUSPECTED CHILD ABUSE OR NEGLECT

1. **ITC** Special considerations: Observe scene for clues & interactions with parents/caregivers

   Criteria needed for a child abuse or neglect investigation by DCFS

   - The alleged victim is a child under the age of 18
   - The alleged perpetrator is a parent, guardian, foster parent, relative caregiver, paramour, any individual residing in the same home, any person responsible for the child's welfare at the time of the alleged abuse or neglect, or any person who came to know the child through an official capacity or position of trust
   - There must be an incident of harm or circumstances that would lead a reasonable person to suspect that a child was abused, neglected, or trafficked

   - Protect the safety of responders, child, and bystanders | Remove child from immediate danger
   - Assess for injuries resulting from acute or chronic events & injury patterns inconsistent with Hx or motor skills based on growth and developmental stage | Be alert to discrepancies in Hx obtained from child vs. caregivers
   - Attempt to preserve evidence whenever possible

2. **Do not confront** suspected perpetrators of abuse/maltreatment | **Treat obvious injuries** per appropriate SOP
3. **Attempt to transport**. If parent/guardian refuses to allow removal of the child, remain at the scene
   - Contact LEO: Ask them to place child in temporary protective custody pending medical evaluation
   - If LEO refuses 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 their 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 parent/guardian's wishes
4. If the parent/guardian physically restrains your efforts to transport: Inform LEOs | Request their support

Children suffering from SUSPECTED ABUSE OR NEGLECT shall not remain in an environment of potential harm unless POINTS 3 & 4 of this SOP have been unsuccessful in removing the child

5. Notify the receiving physician or nurse of the suspected abuse or neglect upon arrival
6. **EMS personnel are mandated reporters and** are required to call the DCFS Hotline when they have reasonable cause to believe that a child known to them in their professional or official capacity may be abused, neglected or trafficked
   The Hotline worker will determine if the information given meets the legal requirements to initiate an investigation
   - 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 (1-800-252-2873)

Be prepared to report the following to the Hotline:

- Names, birth dates (or approximate ages), races, genders, etc. for all adult and child subjects
- Addresses for all victims and alleged perpetrators, including current location
- Information about siblings or other family members, if available
- Specific information about the abusive incident or the circumstances contributing to risk of harm
  Ex: When and where the incident occurred, the extent of the injuries, how the child says it happened, and any other pertinent information

If this information is not readily available, do not delay calling the hotline in an emergency situation

Be prepared to provide phone numbers where you may be reached in case Hotline must call back for more info

7. Thoroughly document the child's Hx and physical exam on the ePCR/HER
   Note relevant environmental / circumstantial data in the comments section or supplemental reports

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

Ref: 325 ILCS 5/) Abused and Neglected Child Reporting Act (ANCRA) (Source: P.A. 79-65.)
https://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1460&ChapterID=32

Definition of "Abused child" expanded. See the Act and local System policies for full definition.

CPR/Resuscitation Guidelines for Adults, Children, Infants			
Age group	**Adults**	**Children**	**Infants**
Recognition of cardiac arrest/initiation of chest compressions	Check for responsiveness | breathing/gasping | pulse Unresponsive/apneic/gasping + no pulse felt within 10 sec – assume cardiac arrest Start compressions w/in 10 sec of arrest recognition if CPR indicated Perform CPR at point of pt contact & on a firm surface in supine position if safe & possible		
Compression/ventilation ratio **before** advanced airway	30:2 (1 or 2 rescuers)	30:2 - single rescuer; 15:2 – 2 HCP rescuers	
CPR **sequence**	CAB – unless hypoxia-related arrest/pediatric or pregnant patient		
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 rescuers: 2 thumbs center of chest, just below nipple line
Chest wall **recoil**	Allow full recoil after compression; lift hand slightly off chest		
Rotation of compressors	No CPR device: Every 2 min during ECG rhythm checks or more frequently if fatigued		
Compression **interruptions** No CPR device	Maximize compression time; limit interruptions to < 5 seconds Ideally, pause only for placement of CPR device back plate; ventilations (until advanced airway), rhythm checks, shock delivery & ROSC confirmation		
Chest compression device	Apply per System policy/procedure		
Verification of quality (high perfusion) CPR	Use real-time CPR feedback device + $EtCO_2$ at least q. 2 min $EtCO_2$ reflects ventilation/perfusion/metabolism; prevents hyperventilation (shows RR) If <20, improve CPR quality; if <10 for 20 min in intubated pt: 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		
BLS Airways	Head tilt/chin lift (SCI: jaw thrust w/o neck extension; if unsuccessful: head tilt/chin lift) Insert OPA/NPA before BVM ventilations unless contraindicated per procedure If SCI suspected: maintain manual SMR; do not use immobilization devices		
Oxygen	NC $EtCO_2$ w/ 15 L O_2: Hold BV mask over $EtCO_2$ w/ tight mask seal to reduce O_2 leak		
Ventilations *Monitor RR w/ $EtCO_2$ if available*	EMS witnessed arrest and/or shockable rhythm & no contraindications: **ApOx** (delayed PPV) for 3 minutes All others: **Adult** 10 BPM (asthma 6-8 BPM) | **Child** (1 breath q. 6 sec) each over 1 sec; to see visible chest rise (adult: 500-600 mL) + bilateral breath sounds midaxillary lines Avoid hyperventilation, high airway pressure (≥ 25 cm H_2O) & gastric distention After Adv. airway: Avoid simultaneous compressions and ventilations		
Defibrillation No pause in compressions to shock if CPR device deployed	Attach/use AED/cardiac monitor as soon as available Apply pads and charge defibrillator (if a shockable rhythm) w/ compressions continuing Minimize compression pauses (< 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: adjust pad placement		
Vascular access; drugs; advanced airways – See SOP			

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

NWC EMSS Drug Appendix

<table>
<tr><th>Name</th><th>Dose/Route</th><th>Action</th><th>Indications for EMS</th><th>Contraindications / Precautions</th><th>Side Effects</th></tr>
<tr><td rowspan="2">ACETAMINOPHEN PO
Peds chewable tablet: 160 mg [BLS]</td><td>≥13 & ≥ 50 kg (110 lbs): 625 to max 1000 mg
≤12 or <50 kg: 12.5 mg/kg, (max 15 mg/kg) PO</td><td>Non-salicylate antipyretic and non-opioid analgesic
Onset: within 15 minutes of initiating infusion.</td><td>PO: Mild to mod pain: HA, muscle aches, arthritis, backache, toothaches, and fever</td><td rowspan="2">Severe hepatic impairment or severe active liver disease
Ask if pt is taking anything that contains acetaminophen
<u>Do not give if last dose within previous 4 hours.</u></td><td rowspan="2">Rare: Severe skin reaction I redness or rash that spreads and causes blistering and peeling
Chills; insomnia, HA, N/V
Peds: Above + constipation, pruritus, agitation, dyspnea, atelectasis</td></tr>
<tr><td>DO not exceed maximum total daily dose.
Adults ≥ 50 kg: 4000 mg
Adults < 50 kg: 3750 mg
Peds: 75 mg/kg in 24 hrs; not to exceed 3750 mg</td><td colspan="2"><table><tr><th>Weight</th><th>Age</th><th>Dose</th></tr><tr><td>24-35 lbs 10-15 kg</td><td>2-3 years</td><td>1 tablet (160mg)</td></tr><tr><td>36-47 lbs 16-21 kg</td><td>4-5 years</td><td>1.5 tablets (240 mg)</td></tr><tr><td>48-59 lbs = 22-27 kg</td><td>6-8 years</td><td>2 tablets (320 mg)</td></tr><tr><td>60-71 lbs = 28-32 kg</td><td>9-10 years</td><td>2.5 tablets (400 mg)</td></tr><tr><td>72-95 lbs = 33-43 kg</td><td>11 years</td><td>3 tablets (480 mg)</td></tr><tr><td>95-110 = 44-50 kg</td><td>12 yrs</td><td>3.5-4 tabs (550-625 mg)</td></tr></table></td></tr>
<tr><td>ACETAMINOPHEN IV
For severe pain
(Ofirmev) Ready-to-use IV solution
1000 mg/100 mL (10 mg/mL)
[ALS]</td><td colspan="5">Adults & Adolescents: Wt. ≥ 50 kg (110 lbs) 1000 mg | < 50 kg: 15 mg/kg (max 750 mg/dose)
Peds: AGE: 2 to 12 years: 15 mg/kg (max 750 mg/dose) – See Peds dose chart p. 106 – Requires an IV Pump
1000 mg: Give without dilution; insert a vented macrodrip IV set through vial septum; open drip chamber vent valve and run as a direct infusion at 60 gtts/min over 15 minutes or set infusion pump at 400 mL/hr.
Doses < 1000 mg in adults and adolescents require an IV pump unless authorized to give as a gravity drip by OLMC
No pump: Calculate amount to give; remove and waste excess drug from <u>container</u>; label vial with drug dose to give; infuse over 15 min
With pump: No need to remove excess drug | Enter desired dose into pump and infuse over 15-16 min.
Don't combine with any other drug or run a secondary infusion on the same line.
Cross check: Confirm dose in mg and mL with 2nd PM or OLMC</td></tr>
<tr><td rowspan="2">ADENOSINE
(Adenocard)</td><td>Adults: 6 mg rapid IVP followed by 10 mL NS flush
Repeat dose: 12 mg rapid IVP + 10 mL NS flush
Peds: 0.1 mg/kg rapid IVP (max 6 mg) + 5 mL NS flush
Repeat dose: 0.2 mg/kg (max 12 mg) + 5 mL NS flush</td><td>Class: Endogenous nucleoside; antiarrhythmic
- Temporarily slows/blocks conduction thru AV node
- Interrupts AV reentry pathways
- Negative chronotropic/ dromotropic
Very short half life
Onset & peak: 10-30 sec
Duration: 30 sec</td><td>- Symptomatic narrow complex tachycardia (PSVT) unresponsive to vagal maneuvers
- Stable, regular, monomorphic wide QRS complex tachycardia unresponsive to amiodarone (OLMC)</td><td>Contraindications
- Asthma -may cause bronchospasm
- Bradycardia
- 2° or 3° AVB (except w/ a functioning pacemaker)
- SA node disease
- Will not terminate known AF/A-flutter, but will slow AV conduction to identify</td><td rowspan="2">Warn pt about flushed face, SOB, & chest pressure/pain before giving. S&S last <10 sec.
- Transient conversion dysrhythmias: sinus arrest w/ vent, junctional, & atrial escape beats; AF, SB, ST, AVB – last seconds, resolve w/o Rx
- VF & asystole in pts on digoxin or verapamil
- Bronchospasm, dyspnea
- ↓ BP; HA, dizziness; N/V</td></tr>
<tr><td colspan="3">- Perform 12L ECG prior to giving
- Proximal IV site preferred; use med port closest to pt
- Larger doses may be needed if on theophylline, caffeine, or theobromide
- Reduce to 3 mg in pts taking dipyridamole (Persantine) or carbamazepine (Tegretol) or w/ transplanted hearts</td><td>Precautions
- WPW: may ↑ vent rate
- Heart transplant (prolonged asystole reported)</td></tr>
</table>

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
ALBUTEROL (Proventil, Ventolin, ProAir, AccuNeb) 2.5 mg / 3 mL [BLS]	**Bronchospasm**: 2.5 mg / HHN / mask / CPAP / BVM; O_2 at 6-8 L depending on unit until mist stops (5-15 min). Give 1st dose w/ ipratropium unless contraind. May repeat X 1. **Hyperkalemia**: 5-mg /neb up to 20 mg over 15 min. DO NOT wait 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, anxiety, dizziness, HA **CV:** ↑ HR; ↑ or ↓ BP, palpitations, angina, dysrhythmias, chest pain **GI:** nausea/vomiting **Resp**: Paradoxical bronchospasm, hypoxia d/t ventilation/perfusion mismatch **Metabolic:** hypokalemia
AMIODARONE 150 mg / 3 mL	**Adult: VT w/ pulse**: **150 mg** mixed in 7 mL NS **slow IVP** or in 50 mL NS **IVPB** given over 10 min **Adult VF/PVT:** 1st dose: 300 mg IVP/IO 2nd dose: 150 mg IVP/IO **Peds VT: 5 mg/kg** (max 150 mg) mixed with NS to total volume of 20 mL in syringe or in 50 mL IVPB Give slow IVP or IVPB over 20 min. **Peds VF/PVT**: 1st dose: 5 mg/kg IVP/IO (Max 300 mg). May repeat up to 3 total doses.	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	- Stable VT w/pulse: (regular, wide QRS tachycardia w/ normal QT - VF/PVT -OLMC: SVT, AF/flutter) Less proarrhythmic effects than other class I or III antidysrhythmics	**Contraindications** - Bradycardia; 2°-3° AVB - Torsades de Pointes - Stop if QRS widens to >50% of baseline - Breast feeding **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/ norepinephrine - Bradycardias - Nausea
ASPIRIN (Acetylsalicylic acid, "ASA") 81 mg tabs	324 mg (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 platelet aggregation; blocks formation of thromboxane A2 - Blocks prostaglandin release (antipyretic, analgesic) - Non-steroidal anti-inflammatory drug (**NSAID**)	Suspected ACS, anginal 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 following recent trauma (esp. head) prior to CT Possible stroke or ICH Currently vomiting; surgery within 2 wks, active bleeding; bleeding disorders; ≥ 6 mos pregnant; severe liver dx	- **GI**: Nausea/vomiting; irritation/bleeding - Prolonged bleeding time - Asthma pts may have ASA sensitivity; cause bronchospasm

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
ATROPINE ***DuoDote Auto-injector*** dosing – see Chemical agents SOP	**Symptomatic bradycardia**: 1 mg rapid IVP/IO q. 3-5 min to max. 3 mg **Cholinergic poisoning:** 1 mg rapid IVP/IO | Repeat q. 3 min until secretions diminish (usual dose limit does not apply). **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 (narrow QRS) & hypotensive BP for pt - Cholinergic poisonings (organophosphates/ WMD gasses) - Neurogenic shock	**Contraindications:** - Asymptomatic bradycardia (w/ normal or high BP) - 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 adds to O_2 demand; excessive tachycardia can worsen ischemia / infarction **Avoid:** 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)
CALCIUM GLUCONATE 2.5% gel **Optional**	Flush area w/ water. Apply gel and massage into burned area. Apply q. 15 min until pain relieved. **Hand burns**: Apply large amount of gel to area, have pt put on vinyl glove and wiggle fingers, opening and closing hand. Change gel & glove q. 5 min by removing glove, wipe off gel, then reapply 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 cold 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 Approved alternative during drug shortage: D50% (25 g in 50 mL) or D25% More frequent consideration of oral carbohydrate – see Glucose Emergencies SOP for adult and peds	See glucose emergencies for dosing instructions. **Adult: bG 60-70:** **12.5 g** (**125 mL** or ½ IV bag) WO **Adult: bG < 60** (no pulm. edema): **25 g (250 mL**) WO **PEDS: 0.5 g/kg** (5 mL/ kg) (0.1 g/1 mL in solution). See dose chart p. **108** Max initial dose: 25 g **Adult: D50%**: 1 mL/kg (max 50 mL) **Peds D25W**:(0.25 g/mL) 2 mL/kg up to 25 g	Class: carbohydrate Dextrose dose is the same in D10% and D50% solutions (25 g); D50% hyperosmolar D10% is 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 followed by reassessment **If S&S HF (crackles or wheezes):** Call OLMC for orders	bG normal or high Do not give SUBQ or IM ✓ patency before infusing Giving too forcefully can result in loss of IV line and damage to surrounding tissues. If IV extravasates, stop infusion & inform OLMC	Hyperglycemia. SE not as likely with D10% as D50%: hyperosmolarity, hypervolemia, phlebitis, pulmonary edema, cerebral hemorrhage, & cerebral ischemia

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
DIPHENHYDRAMINE (Benadryl) **IV/IM: 50 mg/1 mL** [5 mg in 0.1 mL] **PO**: 12.5, 25 or 50 mg tabs PO: BLS IM/IV: ALS	**Lower acuity**: **1 mg/kg** (max 50 mg) PO;] IM/IVP **Emergent: 50 mg IVP**; 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; **slow IVP/IO over 2 min;** if no IV/IO give IM See appendix dose chart	Antihistamine: H1 blocker Peak: 1 hr Half-life: 2.5-9 hrs Does not reverse histamine; prevents more from being released. Slower acting than 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 SUBQ - 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
EPINEPHRINE **1 mg / 1 mL IM [BLS]** Do not inject IVP **1 mg / 10 mL IVP/IO/ neb [ALS]** ***Push dose [ALS]*** **See Appendix dose charts**	**1 mg/1 mL** **Adult Emerg 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; May repeat q. 5 min to 2 mg. **Peds Emerg Allergic Rxn/severe asthma:** <25 kg (≤**54 lbs**): 0.15 mg **≥** 25 kg (≥**55 lbs**): 0.3 mg **IM** (Vastus Lateralus muscle a anterolateral thigh) If no IV/IO: May repeat q. 5 min prn to a max total dose of 1 mg. **Do NOT delay transport** waiting for a response **1 mg/10 mL** **Adults: Cardiac arrest:** 1 mg IVP/IO q. 6 min. **Adult Anaphylaxis:** 0.1 mg IVP/IO doses q. 1 min to max total dose of 2 mg [all routes]. Reassess after each 0.1 mg increment.	Nonselective adrenergic agonist; acts on alpha & beta receptors (dose dependent) **Low dose** (< 0.3 mcg/kg/min or <0.5mg) (IM) **– ß-2** dominates: Relaxes bronchial smooth muscle (**bronchodilator**); relieves congestion, edema, wheezing and dyspnea. Inhibits histamine release & antagonizes effects on end organs **ß-1 effects** - ↑ Automaticity; electrical activity - ↑ HR (+ chronotropic) - ↑ CO (+ inotropic) - ↑ Conduction velocity (+ dromotropic) **Higher dose** (> 0.3 mcg/ kg/min) (IVP/IO) or ≥0.5 mg: **ß + alpha**) - Vasoconstrictor; ↑ SVR & BP; ↓ vascular permeability that leads to vascular fluid volume loss and hypotension- - Stabilizes mast cells and basophils	**1mg / 1 mL** - Moderate allergic reaction (IM) - Anaphylaxis: no IV/IO: IM - Mod to severe asthma **1 mg / 10mL** - All pulseless arrests: VF/pulseless VT, asystole, PEA (IV/IO) - Symptomatic bradycardia in peds - Severe allergic reaction/ anaphylaxis IV/IO Severe croup/epiglottitis/ bronchiolitis/RSV (HHN) If needed: Epi 1 mg/10mL can be constituted by adding 9 mL of NS to epi 1 mg/1mL.	**Contraindications:** VT due to cocaine use **Precautions:** Give O_2, monitor ECG & VS when giving Epi Inactivated in an alkaline solution don't mix w/ bicarb in IV tubing at the same time **Use IM w/ caution if**: - HR > 100 - Hx. CVD/HTN - Current HTN, HF - ß blockers antagonize cardiostimulating and bronchodilating effects (produce only α effects) Alpha blockers antagonize vasoconstriction & hypertensive effects Digitalis (↑ heart sensitivity 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 / Precautions	Side Effects
Epinephrine cont.	**Peds anaphylaxis**: 0.01 mg/kg slow IV/IO over 10 min. After 3 min may repeat X1 to a Max total dose of 1 mg [all routes]. Reassess after each increment. **Severe croup/Epiglottitis/ bronchiolitis/RSV**: Neb 0.5 mg (5 mL) w/ 6 L O_2 **Peds bradycardia/cardiac arrest:** 0.01 mg/kg up to 1 mg (max single dose) IV/IO q. 6 min	- 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	**PUSH DOSE EPI IVP/IO** Alternative inopressor for bradycardia, cardiogenic or septic shock w/severe hypotension (MAP ≤45 mmHg) & pulse present **Adults**: Mixing instructions: waste 9 mL of Epi 1 mg/10 mL (cardiac preload); draw up 9 mL NS (**10 mcg/mL or 0.01 mg/mL**). Label syringe. Give 0.5 to 1 mL (5-10 mcg) IVP/IO boluses or "pushes" q. 2-5 min to desired BP (MAP). Onset 1 min; duration 5-10 min; reassess after each bolus. **Peds**: Mixing instructions: Draw up the standard code dose (Epi 1 mg/10 mL **0.01 mg/kg -** see chart in appendix) into a 10 mL syringe and then dilute with NS to make a total of 10 mL of fluid in syringe. Each 1 mL now has 1 mcg/kg or 0.01 mg/kg epinephrine for that pt. Label syringe. Push 0.5 to 1 mL q. 2-5 min IVP/IO to desired BP (MAP). Reassess after each bolus.		
ETOMIDATE (Amidate) 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; 3-12 min	Alternate option to ketamine for sedation in children ≥10 and adults prior to ADV airway placement if patient is responsive	**Contraindications** - Septic shock d/t adrenal suppression - Children <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 SE more likely w/ ↓ renal function
FENTANYL Citrate 100 mcg / 2 mL ampules or vials IVP / IN / IM / IO See PAIN MGT SOP Appendix dose charts --- **Titrate amount** given based on pt size, age, condition, and response. Document VS, ECG, SpO_2, $EtCO_2$, GCS, and pain rating before and w/in 5 min after each dose.	Bring unused portion to ED **Adults & peds ≥ 2 years: 1 mcg/**kg (round to nearest 5 mcg) up to **100 mcg** **2nd dose** in 5 min prn: 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: OLMC**. May repeat 0.5 mcg/kg q. 5 min to 3 mcg/kg (300 mcg) if indicated. Pts on chronic opioid therapy/ Hx opioid use disorder **may need an alternate pain med:** ketamine; acetaminophen	**Class**: Synthetic opioid Short acting opioid **Onset**: minutes (slight delay 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 reduced by at least 2 points on pain scale or to tolerable levels (may not reach 0) unless contraindicated or refuses **Reverse with naloxone**	**Severe pain (7-10)** Pharmacologic and non–pharmacologic options should reflect a person–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. **Safety in children <2 years of age has not been established:** Call OLMC	**CONTRAINDICATIONS** - Intolerance to opioids - AMS (GCS <15) or inapprop. for age/baseline - Respiratory depression - Hypotension - Acute/severe asthma - Myasthenia Gravis - Pts on depressant drugs **PRECAUTIONS**: - Avoid over sedation COPD (resp. depression) - Concurrent use of alcohol, benzos, SUD - Bradydysrhythmias; 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

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
GLUCAGON **[BLS: IM, IN]** GlucaGen: reconstitute w/ 1 mL sterile water for inj. Lilly: reconstitute only w/ 1 mL diluent; do not use diluent w/ other drugs When reconstituting: Roll (don't shake) vial; do not mix with NS	**Hypoglycemia if** no IV/IO: **1 mg IM, IN** Anaphylaxis/bradycardia due to ß blockers & refractory to Rx: 1 mg IVP/IO/IM/IN **Peds:** **≥ 20 kg** (45 lbs) **:** 1 mg **<20 kg** (44 lbs): 0.5 mg IVP/IO/IM/IN IM: Vastus Lateralus muscle anterolateral thigh	**Class**: Hormone - ↑ blood glucose: converts 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 drugs & 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
GLUCOSE GEL By waiver for BLS-only agency	Adult: 25 g orally Peds: 0.3 g/kg (10-20 g) May repeat in 10-15 min	- Carbohydrate - Increases serum glucose level	Hypoglycemia in awake pt able to swallow safely with GCS 14-15 and 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**	5 g 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 added to albuterol/HHN/in-line neb **Peds** 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:** - Allergy 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 nausea **Eyes**: Blurred vision, dilated pupil (mist leak into eyes). Neb mouthpiece preferred over mask to avoid eye contact if glaucoma.
KETAMINE IV inj. 50 mg /mL **Carefully estimate wt. | dosing chart (see appendix)**	**Pain**: 0.3 mg/kg (max initial dose 50 mg) slow IVP (over 1 min); or IN/IM. May repeat X 1 in 20 min. Max cumulative dose: 100 mg.	Produces unique hypnotic, analgesic + amnestic effects based on dose NMDA receptor antagonist Schedule III controlled substance; nonbarbiturate, sedative hypnotic	Sedation prior to ADV airway in responsive pts Sedation for violent behavior; delirium with extreme agitation	Withhold if ↑ BP serious hazard - Hypertensive crisis - Use of methamphet-amine or similar drug - Acute MI, angina, HF - Intracranial hemorrhage or suspected ↑ICP - Eye injury or glaucoma	**CV**: Transient ↑ HR & HTN (SBP ↑10-50%); returns to prior levels w/in 15 min. Benzo may decrease CV effects. **CNS**: Psychosis, dysphoria (dose-related) **MSK**: Rigidity, dystonic reaction, depressed reflexes

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
Ketamine cont. Titrate amount given based on pt size, condition, intended action and response. **Document** VS, ECG, SpO_2, $EtCO_2$, GCS, pain rating (if appl.) before (if able) and 5 min after each dose	**SEDATION DOSES** **ADV airway or Delirium w/ extreme agitation**: 2 mg/kg slow IVP or 4 mg/kg IN/IM (max 300 mg) **Additional doses: OLMC** **Optional dosing approach** if urgent need for SEDATION and NO IV/IO & based on ~ pt. wt.: Up to 50 mg (1 mL) IN (NASAL) each nostril (unless contraindicated); may repeat within 90 seconds **+/or** Up to 150 mg (3 mL) IM (may use both thighs through clothing prn). Max cumulative dose: 300 mg per SOP.		Non-opioid analgesic, for those with severe pain who are opioid dependent or intolerant; refuse an opioid, have an allergy to fentanyl or option if pt needs mild sedation + pain relief After giving: minimize stimulation (verbal/ auditory, tactile, visual).	Hyperthyroidism - Aortic dissection - Known adrenal tumor - Severe liver disease - Produces dose dependent increases in uterine contractions (varies by trimester). Not recommended in pregnancy; avoid use if other options are available. Caution w/ active psychosis	**Resp**: Beta-adrenergic and vagolytic properties cause bronchodilation; ↑secretions; resp. depression (hypoxia, hypercapnia); laryngospasm **Psych**: Emergence reactions: Rx w/ midazolam (sedation dose)
LIDOCAINE 2% (xylocaine) 100 mg / 5 mL Observe concentration carefully before administering	**IO line if pt responsive:** **Adult:** 1 mg/kg (max 50 mg) **Peds**: 0.5 mg/kg (max 40 mg) Push IO slowly over 2 min BEFORE NS flush (unless contraindicated). Allow to dwell in IO space 60 sec. before flushing line w/ 5-10 mL NS | If needed: Adult: slowly give an additional 0.5 mg/kg (max 20 mg) IO over 60 seconds	**Class**: Antiarrhythmic & local anesthetic (amide-type)	IO anesthesia in responsive pts before NS infusion OLMC may order for refractory VF	**Contraindications:** - Allergy to "caines" or local amide anesthetics - Bradycardia: Wide complex or AVBs **Use with caution:** - Hepatic or renal failure - Recent use/cocaine toxicity	**CNS**: Drowsiness, ataxia, disorientation, dizziness, paresthesias, slurred speech, impaired hearing / vision **CV**: ↓ BP, ↓ HR, wide QRS, prolonged QT, CA May worsen conduction delays & slow vent. rate
MAGNESIUM SULFATE 50%	**ADULT: Critical asthma | Torsades | Preeclampsia** **2 g** in16 mL NS (slow IVP) or in 50 mL NS IVPB; give over 10 min. Max 1 g /5 min **Eclampsia** (seizure occurs): May repeat above dose X 1 to total of 4 g IVP/IO **PEDS: Critical asthma/ Torsades: 25 mg/kg** (max 2 g) in NS (**20 mL** slow **IVP**) or in **50 mL (IVPB) |** over 10 min. Max 1 g / 5 min.	- Intracellular cation responsible for metabolic processes & enzyme reactions. Need for ATP production - Membrane stabilizer - Blocks neuromuscular transmission and muscular excitability - Class V antidysrhythmic - Acts like a Ca blocker - smooth muscle relaxant (vaso and bronchodilator)	- Severe asthma that responds poorly to epi - Torsades de Pointes - Preeclampsia/ eclampsia: 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	**CNS**: Lightheadedness, drowsiness, sedation, confusion **CV**: ↓ HR, dysrhythmia, vasodilation w/ ↓ BP **Resp**: 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 Cont. below	**Adults** **Cardioversion if responsive:** 2-5 mg IVP/ IN | May repeat to max dose 10 mg **Sedation: pacing, anxiety;** serotonin syndrome; muscle relaxant; stimulant induced HTN: 2 mg increments slow IVP **q. 2 min** (0.2 mg/kg IN) up to 10 mg.	Class: Benzodiazepine - Sedative/hypnotic - CNS depressant - Anxiolysis (↓ anxiety) - Amnestic (anterograde) - Skeletal muscle relaxant **NO analgesic effects**	- Ongoing sedation after advanced airway - Anxiety assoc. with transcutaneous pacing - Procedural sedation prior to cardioversion - Generalized tonic/clonic seizure activity - Anxiety	**CONTRAINDICATIONS** - Glaucoma - Hypotension (SBP <90) - Pregnancy unless seizing & unresponsive to magnesium (eclampsia)	**CNS**: Drowsiness, sedation, confusion, amnesia, ataxia **Resp**: Respiratory depression, arrest **CV**: Hypotension, bradycardia/tachycardia

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
Midazolam cont. **Titrate amount** given based on pt size, age, condition, intended action, and response. **Document** VS, SpO_2, $EtCO_2$, and GCS before (if able) and w/in 5 min after each dose. Contact OLMC for additional dosing	**Adult generalized tonic clonic seizures**: **2 mg** increments IVP/IO **q. 30-60 sec** IVP/IO (0.2 mg/kg IN) up to 10 mg. **If No IV/IO/IN: give IM:** 5-10 mg (0.1-0.2 mg/kg) max 10 mg. **All routes: May repeat** to 20 mg if SBP ≥ 90 (MAP ≥ 65) unless contraindicated	Potentiates GABA (major CNS inhibitory neurotransmitter). May potentiate action of other CNS depressants (fentanyl, alcohol) – monitor closely **Onset** IV/IN/IO:1-3 min (slower in doses < 0.2 mg/kg); IM 5-15 min **Duration**: 15-30 min	Muscle relaxant for long bone fractures - Stimulant (cocaine, amphetamines, ephedrine, PCP) induced severe HTN/ tachycardia - Serotonin syndrome	**PRECAUTIONS:** Individualize dose based on age, SBP/MAP; weight, physical & clinical status, pathologic condition, concomitant meds, nature of indication	
	If hypovolemic, elderly, debilitated, PMH chronic dx (HF/COPD); prone to ventilatory depression (SCI); and/or on opioids or CNS depressants: ↓ **total dose to 0.1 mg/kg**.				
	Peds standard dose sedation | anxiety: 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (Max single dose 2 mg). May repeat q. 2 min to a max total dose < 6 yrs: 6 mg | 6-12 yrs: 10 mg titrated to size and age-appropriate VS & response **Peds generalized tonic-clonic seizures**: 0.1 mg/kg IVP/IO (0.2 mg/kg IN/IM) (Max single dose 2 mg) q. 30-60 sec up to a max total dose < 6 yrs: 6 mg | 6-12 yrs: 10 mg based on size and titrated to stop seizure | If seizures persist: Contact OLMC for additional dosing.				
MORPHINE **10 mg in 2 mL** *(Only carry as an approved alternate opioid analgesic)*	**0.1 mg/kg (no more than** 2 mg max increments) every 2-3 min up to 10 mg **slow** IVP/IO. If no IV/IO: 10 mg IM.	- Opioid analgesic - ↓ adverse effects of over activity of the SNS and myocardial O_2 demand - CNS depressant - Mild venous and arterial dilator; ↓ preload & LV afterload -Causes histamine release	SBP ≥ 90 (MAP ≥ 65) Severe pain when fentanyl is indicated **Reverse with naloxone**	- Allergy - MOI inhibitor in last 14 d **Caution**: ↓ SBP (MAP), volume depletion - Hypovent. ($EtCO_2$ >45); hypoxia after O_2 (SpO_2 <90%) - Preload dependent - GCS <15; head injury - On depressant drugs	**CNS**: Sedation, H/A **CV:** ↓ SVR, BP, HR **Resp**: Depression **Eyes**: Dry eyes, blurred vision **GI**: N/V **Skin:** Rash, itching SE enhanced if used w/ ETOH, sedatives, hypnotics, barbs, antihistamines, antiemetics
NALOXONE (Narcan) Concentration: 2 mg / 2 mL EMR/EMTs IN & IM	**Adult:** 1 mg IVP/IN/IO/IM **PEDS**: **0.1 mg/kg** (max single dose 1 mg) **IVP/IN/** IO/IM Repeat doses q. 2 min until ventilations resume/ increase **Max**: 4 mg / EMS Additional doses: OLMC	Opioid antagonist. Will not reverse alcohol, benzodiazepines, or other toxicities; attaches only to opioid receptors. 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 opioid; repeat doses are often required	- Opioid toxicity w/ AMS + respiratory depression - Coma of unknown etiology with respiratory depression (May or may not have constricted pupils based on drug combinations)	**Precautions:** - Rapid reversal may cause **opioid withdrawal** syndrome (agitated, combative, uncooperative, rapid HR) - Give O_2 while prepping med to prevent reversal tachycardia -Caution in infants of addicted moms or pts dependent on opioids w/ CV dx (OLMC)	**CNS:** Tremor, agitation, combativeness, seizure (stimulates the SNS) **CV:** ↑ HR, ↑ BP, dysrhythmias **Resp:** Hyperventilation **GI**: N / V Rare anaphylactic reactions & flash pulmonary edema reported after naloxone use.

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
NITROGLYCERIN (NTG)	**ACS**: 0.4 mg tabs SL or spray. May repeat q. 3-5 min up to 3 doses **Pulmonary edema:** Unlimited doses if SBP ≥90/ DBP >60 (MAP ≥65) 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	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 Onset: 1-3 min	- ACS w/ suspected ischemic pain [BLS] - Pulmonary edema - Hypertensive crisis w/ chest pain/pulm. edema **Other contraindications:** - Recent use of sildenafil (Viagra, Revatio); vardenafil (Levitra, Staxyn) w/in 24 hrs or tadalafil (Cialis, Adcirca) w/in 48 hrs - Pts receiving IV epoprostenol (Flolan) or treporstenil (Remodulin) for pulm. HTN	**ACS**: - 1st dose: SBP <90 w/o IV and IVF challenge 2nd & 3rd doses: SBP <100 or >30 mmHg below baseline - HR <50 or >100 w/o HF **HF:** - BP < 90/60 - Use w/ caution if preload dependent (RV inferior wall STEMI w/ ST elevated in V4R; esp. if bradycardic (OLMC required): start IV first; monitor for hypoperfusion - ↑ ICP; glaucoma; Peds <18	**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 SBP <90. **GI:** SL admin – burning, tingling Flushed skin Methemoglobinemia
NOREPINEPHRINE drip **(Levophed)** Packaging: 4 mg / 4 mL Mix in 1 L NS to make IVPB drip (Special EMS concentration for easy dosing) See appendix for dosing charts	**IVPB (large vein) / IO** Mix: 4 mg in 1,000 mL D_5W or NS (4 mcg/mL); label IV. **Adult initial dose**: 8 mcg/ min (2 mL/min), titrate to SBP ≥ 90 (MAP ≥ 65). **Peds dose: 0.1 mcg/kg/ min** (max 1 mcg/kg/min up to 8 mcg/min) titrated to SBP >70 + (2 X age in yrs) Higher doses (10 mcg/min) RARELY needed | contact OLMC Assess BP (MAP) q. 2 min until target BP reached (don't overshoot) | Then reduce dose (drip rate) incrementally just to maintain at BP targets. Maintenance: Adult: 2 to 4 mcg/min (0.5 mL to 1 mL/min) or less | Continue to reassess BP q. 5 min.	Catecholamine from sympathetic NS neurons **Inopressor** acts on α1 and α2 adrenergic receptors to cause **vasoconstriction** and ↑ peripheral vascular resistance + Beta 1 stimulant: ↑ HR, **SV,** CO ✓ Infusion site frequently for patency. Inform OLMC ASAP if infiltration occurs.	**Severe hypotension** (MAP < 60) **Vasodilatory shock** (septic and neurogenic) **Cardiogenic shock** Safety and effectiveness in pregnant pts not proven. Call OLMC prior to giving. Fewer side-effects than dopamine	Hypovolemic shock Do not give $NaHCO_3$ in IV line w/ norepinephrine **Cautions:** - Pts receiving MAO inhibitors or antidepressants of the triptyline or imipramine types - severe, prolonged HTN may result. -Asthma; -bisulfite sensitivity At high prolonged doses, esp. when combined with other vasopressors, can lead to limb ischemia	**CV**: Severe HTN, vasoconstriction; tachy-cardic dysrhythmias; ↓ renal perfusion and urine output, poor systemic blood flow despite "normal" BP, tissue hypoxia, 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
NORMAL SALINE (0.9% NaCl)	**TKO**: 15-30 gtts/min **Adults: Fluid challenges** 200 mL boluses up to 1 L to achieve hemodynamic stability (target MAPs) **Sepsis**: **200 mL IV boluses** (max 20 mL/kg) to SBP ≥90 (MAP ≥65) Carefully monitor clinical condition and VS	Class: Isotonic crystalloid Contains 154 mEq/L Na ions 154 mEq/L Cl ions **Peds:** 20 mL/kg IVP over 20 min or as fast as possible for shock; may repeat X 2 prn **Document amt. given (total volume) in mL**	- Need for IV medications - Poor perfusion needing volume replacement (trauma, shock, dehydration, DKA, HHNS)	**Precautions:** Limit volume in pts w/ HF Limit volume to BP targets Stop infusion if S&S of fluid overload (crackles)	- Fluid overload if excess volume/infused too rapidly - Pulmonary edema - pH is low: acidosis with high chloride load if given in large volumes

Name	Dose/Route	Action	Indications for EMS	Contraindications / Precautions	Side Effects
NITROUS OXIDE (Nitronox, Entonox) **Optional**	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 obs.; Pregnancy **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 4 mg Oral Dissolve Tabs (ODT) For parenteral inj. 2 mg / mL	**Adults:** 4 mg ODT or IVP over no less than 30 sec. May repeat in 10 min to total dose of 8 mg ODT or IVP. **Peds**: 0.15 mg/kg up to a total of 4 mg IVP or ODT	Selective 5-HT3 (serotonin) receptor antagonist Antiemetic	Nausea/vomiting Consider prior to giving an opioid if PHM of nausea to that drug class	Phenylketonuria (PKU): ODT contains aspartame that forms phenylalanine Note: Don't push ODT through blister foil pkg.; tabs are fragile	Rare: Transient blurred vision after rapid IV infusion HA, lightheadedness Sedation Diarrhea in children
SODIUM BICARBONATE inj. 8.4% ($NaHCO_3$)	**TCA OD; cardiac arrest w/ pre-existing acidosis:** 1 mEq/kg (1 mL/kg) IVP/IO (max 50 mEq) Repeat if ↓ BP, AMS, QRS ≥ 0.12 sec, or dysrhythmias **Renal failure w/ hyperkalemia; Crush syndrome:** 50 mEq slow IVP/IO over 5 min.	Class: Alkalinizing agent - buffers acidosis - Raises serum pH - ↓ uptake of cyclic antidepressants - Shifts K into cells **Notes:** ✓ IV patency before infusing. Flush IV before & after giving.	- Known hyperkalemia - Cardiac arrest with metabolic acidosis (severe renal disease/DKA); drugs: ASA, TCA OD, 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 cate-cholamines 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 cellulitis, necrosis, tissue sloughing
TETRACAINE (0.5% solution Pontocaine) Eye drops	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**: Ca channel blocker - Slows depolarization of slow-channel electrical cells - Slows conduction through AV node to control vent. rate assoc. with rapid atrial rhythms - Relaxes smooth muscle - Dilates coronary arteries - ↓ afterload & myocardial contractility	- Stable SVT unresponsive to vagal maneuvers & adenosine - AF, A-flutter, multifocal atrial tachycardia (MAT) w/ rapid ventricular response (Rarely converts AF to SR. If AF >48 hrs, conversion to SR has risk of embolism) - Angina per OLMC order	**Contraindications** - ↓ BP; HF, shock - Wide complex tachycardias of uncertain origin or poisoning/ drug-induced tachycardia - 2°-3° AVB w/o functional pacemaker; VT - WPW, short PR & sick sinus syndromes - Hypersensitivity | Peds **Precautions**: May ↓ BP if used w/ 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

Notes on Drug Routes: IN generally preferred prior to IM unless contraindicated	
IN or NAS: ✓ nostrils for secretions/obstructions; suction; remove NPA; max 1 mL/nostril; if total volume > 0.4 mL, divide dose into 2 syringes; BRISKLY depress syringe plunger to atomize medication. DO NOT have pt inhale while giving. **IV:** Select site based on vein condition, purpose (fluid/drugs to be infused); pt. age/ size, clinical status and presence of special vein & skin problems (elderly, peds, obese pts; those with AV shunts or grafts; and previous mastectomies). Maintain aseptic technique; confirm line patency, flush tubing after drug delivery; use arm board if access near point of flexion. Consider saline lock if IVF not indicated.	**IM** preferred site: Vastus Lateralus muscle mid-anterolateral thigh **IO approved sites:** **Adult ≥ 22 yrs:** Proximal humerus; proximal tibia; distal tibia **Peds & up to 21 yrs:** Proximal humerus; proximal tibia; distal tibia; distal femur **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** per Drug Appendix (adult & peds doses) **All IO**: put IV bag into pressure infuser

7 RIGHTS of medication administration - RIGHT	
Patient: Confirm absence of allergy	
Drug **Dose**	✓ package/drug container for name, concentration, integrity/sterility of parenteral medication, expiration date (do not use if expired unless authorized in writing by EMS MD/FDA) | Prepare dose in compliance with SOP/OLMC | Controlled substances, IV inopressors; and high risk meds (peds dosing/others per protocol) **require a Medication Administration Cross-check Procedure (MACC)** with another qualified practitioner before giving.
Timing of administration: See drug profile or individual SOP	
Route & site: See above	
Reason: Must be indicated and not contraindicated for patient | Risk : benefit analysis	
Documentation: Must note drug, concentration if epinephrine, dose, route; time of administration, and patient response for each individual dose	

Medication Administration Cross Check procedure:

Two-person verbal procedure using intentional steps to find and prevent drug errors in high-risk situations.

1. **Person preparing dose**: Confirm that all "Rights" of medication administration above have been followed
2. **Whenever possible: Verify with 2nd practitioner authorized to give that drug:**
   - Verbally alert partner to Medication Cross Check – receive affirmation they are ready to participate
   - State indication for drug and lack of contraindications – receive affirmation that drug is indicated
   - Show packaging to confirm **medication name, concentration – receive affirmation of correct drug**
   - Both do dose calculation (independently using SOP, dosing charts, or electronic dose calculator)
     Mutually verify that correct dose (amount of drug and volume of solution) has been prepared and syringe or IV container is **labeled correctly**
   - Mutually confirm route and rate of administration

Weight estimation: Accurate measurement and/or estimation in kg is important for many drugs and EMS interventions | EMS estimations are highly variable

Approved options:

1. Direct measurement using a scale (often not available) | Pt or caregiver self-report (consider accuracy)
2. **Peds pts ≤12:** Length-based tape (Broselow) or approved equivalent - measure head to heel
   If child cannot lie flat, est. using Broselow age: wt table or Pedi Wheel. **Note:** Age-based formulas and length-based methods without habitus adjustment tend to predict ideal (not actual) body weight.
3. **Child taller than tape & adults** (may not be valid in elderly)**:** Mid-upper arm circumference (MUAC) formula:
   Wt in kg = 4 X MUAC (in cm) – 50. Use left upper arm; measure at mid-point between tip of shoulder & elbow.

Zone	Patient weight	Age
3 kg, 4 kg, and 5 kg zones	3 kg, 4 kg, and 5 kg	< 3 mos
Pink	6–7 kg	3–5 mos
Red	8–9 kg	6–11 mos
Purple	10–11 kg	12–24 mos
Yellow	12–14 kg	2 yrs
White	15–18 kg	3–4 yrs
Blue	19–23 kg	5–6 yrs
Orange	24–29 kg	7–9 yrs
Green	30–36 kg	10–11 yrs

Peds Doses Round up to next closest dose that can be given	***ACETAMINOPHEN IV*** ***15 mg/kg*** *(1,000 mg/100 mL)* *Max dose: 750 mg* *Max daily : 3750 mg*	**ADENOSINE** **0.1 mg/kg** (6 mg/2 ml) Max: 6 mg 1st dose	**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	**DIPHENHYRAMINE** **1 mg/kg (max 50 mg)** **50 mg/mL** IVP/IO over 2 min (no IV/IO give IM)	**EPINEPHRINE** **1 mg/1 mL** 0.01 mg/kg IM max 0.3 mg
Weight	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / ml**	**Dose mg / mL**
6.6 lbs = 3 kg	45 mg = 4.5 mL	0.3 mg = 0.1 mL	15 mg = 0.3 mL	0.06 mg = 0.6 mL		
8.8 lbs = 4 kg	60 mg = 6 mL		20 mg = 0.4 mL	0.08 mg = 0.8 mL		
11 lbs = 5 kg	75 mg = 7.5 mL	0.5 mg = 0.2 mL	25 mg =0.5 mL	0.1 mg = 1 mL	5 mg = 0.1 mL	
13 lbs = 6 kg	90 mg = 9 mL		30 mg = 0.6 mL	0.12 mg = 1.2 mL		
15.4 lbs= 7 kg	105 mg = 10.5 mL		35 mg =0.7 mL	0.14 mg = 1.4 mL		
17.6 lbs = 8 kg	120 mg = 12 mL	0.8 mg = 0.3 mL	40 mg =0.8 mL	0.16 mg = 1.6 mL		
19.8 lbs = 9 kg	135 mg = 13.5 mL		45 mg =0.9 mL	0.18 mg = 1.8 mL		
22 lbs = 10 kg	150 mg = 15 mL		50 mg = 1 mL	0.2 mg = 2 mL	10 mg = 0.2 mL	0.1 mg = 0.1 mL
24.2 lbs = 11 kg	165 mg = 16.5 mL	1.1 mg = 0.4 mL	55 mg = 1.1 mL	0.22 mg – 2.2 mL		
26.4 lbs = 12 kg	180 mg = 18 mL		60 mg = 1.2 mL	0.24 mg = 2.4 mL		
28.6 lbs – 13 kg	195 mg = 19.5 mL		67.5 mg = 1.3 mL	0.26 mg = 2.6 mL		
30 lbs = 14 kg	210 mg = 21 mL	1.4 mg = 0.5 mL	70 mg = 1.4 mL	0.28 mg = 2.8 mL		
33 lbs = 15 kg	225 mg = 22.5 mL		75 mg =1.5 mL	0.3 mg = 0.3 mL	15 mg = 0.30 mL	0.15 mg – 0.15 mL
35 lbs = 16 kg	240 mg = 24 mL		80 mg = 1.6 mL	0.32 mg = 3.2 mL		
40 lbs = 18 kg	270 mg = 27 mL	1.8 mg = 0.6 mL	90 mg = 1.8 mL	0.36 mg = 3.6 mL		
44 lbs = 20 kg	300 mg = 30 mL	2 mg = 0.7 mL	100 mg = 2 mL	0.4 mg = 4 mL	20 mg = 0.40 mL	0.2 mg = 0.2 mL
48 lbs = 22 kg	330 mg = 33 mL		110 mg = 2.3 mL	0.44 mg = 4.4 mL		
53 lbs = 24 kg	360 mg = 36 mL	2.4 mg = 0.8 mL	120 mg = 2.4 mL	0.48 mg = 4.8 mL		
55 lbs = 25 kg	375 mg = 37.5 mL		125 mg = 2.5 mL	**0.5 mg – 5 mL**	25 mg = 0.5 mL	
57 lbs = 26 kg	390 mg = 39 mL	2.6 mg = 0.9 mL	130 mg = 2.6 mL	0.52 mg = 5.2 mL		
62 lbs = 28 kg	420 mg = 42 mL		140 mg = 2.8 mL	0.56 mg = 5.6 mL		
66 lbs = 30 kg	450 mg = 45 mL	3 mg = 1.0 mL	**150 mg = 3 mL**	0.6 mg = 6 mL	30 mg = 0.6 mL	**0.3 mg = 0.3 mL**
70 lbs = 32 kg	480 mg = 48 mL	3.2 mg = 1.1 mL	160 mg = 3.2 mL	0.64 mg = 6.4 mL		**Max Single Dose**
75 lbs = 34 kg	510 mg = 51 mL	3.4 mg = 1.1 mL	170 mg = 3.4 mL	0.68 mg = 6.8 mL	34 mg = 0.7 mL	
79 lbs = 36 kg	540 mg = 54 mL	3.6 mg = 1.2 mL	180 mg = 3.6 mL	0.72 mg = 7.2 mL		
84 lbs = 38 kg	570 mg = 57 mL	3.8 mg = 1.3 mL	190 mg = 3.8 mL	0.76 mg = 7.6 mL		
88 lbs = 40 kg	600 mg = 60 mL	4 mg = 1.3 mL	200 mg = 4 mL	0.8 mg = 8 mL	40 mg = 0.8 mL	
99 lbs = 45 kg	675 mg = 67.5 mL	4.5 mg = 1.5 mL	225 mg = 4.5 mL	0.9 mg = 9 mL	45 mg = 0.9 mL	
110-128 lbs / 50-58 kg	**750 mg = 75 mL**	5 mg = 1.7 mL	250 mg = 5 mL	**1 mg = 10 mL**	**50 mg = 1 mL**	

Peds Doses Round up to next closest dose that can be given	**FENTANYL** **1 mcg/kg** (100 mcg / 2 mL) **(max 100** mcg); 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 g) 5 g/10 mL=1 g/ 2 mL	**MIDAZOLAM** **0.1 mg/kg IVP/IO** (10 mg/ 2 mL) Max total <6 yrs: 6 mg 6-12 yrs: 10 mg	**ONDANSETRON** **0.15 mg/kg** (4 mg/2 mL) Max single dose 4 mg	**MIDAZOLAM** **0.2 mg/kg IM/IN** (10 mg/ 2 mL) Max total <6 yrs 6 mg 6-12 yrs: 10 mg	**NALAXONE** **0.1 mg/kg** (2 mg/ 2 mL) Max single: 1 mg Max Total: 4 mg
Weight	**Dose mcg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**
6.6 lbs = 3 kg		0.03 mg = 0.3 mL	75 mg = 0.15 mL			0.6 mg = 0.1 mL	0.3 mg = 0.3 mL
8.8 lbs = 4 kg		0.04 mg = 0.4 mL	100 mg = 0.2 mL		0.6 mg = 0.3 mL		0.4 mg = 0.4 mL
11 lbs = 5 kg		0.05 mg = 0.5 mL	125 mg = 0.25 mL	0.5 mg = 0.1 mL			0.5 mg = 0.5 mL
13 lbs = 6 kg		0.06 mg = 0.6 mL	150 mg = 0.3 mL		0.9 mg = 0.4 mL	1.2 mg = 0.2 mL	0.6 mg = 0.6 mL
15.4 lbs= 7 kg		0.07 mg = 0.7 mL	175 mg = 0.35 mL	0.7 mg = 0.15 mL	1 mg = 0.5 mL		0.7 mg = 0.7 mL
17.6 lbs = 8 kg		0.08 mg = 0.8 mL	200 mg = 0.4 mL		1.2 mg = 0.6 mL	1.6 mg = 0.3 mL	0.8 mg = 0.8 mL
19.8 lbs = 9 kg		0.09 mg = 0.9 mL	125 mg = 0.45 mL				0.9 mg = 0.9 mL
22 lbs = 10 kg	10 mcg = 0.2 mL	0.1 mg = 1 mL	250 mg = 0.5 mL	1 mg = 0.2 mL	1.5 mg = 0.7 mL	**2 mg = 0.4 mL**	**1 mg = 1 mL**
24.2 lbs = 11 kg			275 mg = 0.55 mL		1.65 mg = 0.8 mL	**Max Single Dose**	**Max Single Dose**
26.4 lbs = 12 kg		0.12 mg = 1.2 mL	300 mg = 0.6 mL	1.2 mg = 0.25 mL	1.8 mg = 0.9 mL		
28.6 lbs – 13 kg			325 mg = 0.65 mL			2.5 mg =0.5 mL	
30 lbs = 14 kg		0.14 mg = 1.4 mL	350 mg = 0.7 mL		2 mg = 1 mL		
33 lbs = 15 kg	15 mcg – 0.3 mL	0.15 mg – 1.5 mL	375 mg = 0.75 mL	1.5 mg = 0.3 mL		3 mg = 0.6 mL	
35 lbs = 16 kg		0.16 mg = 1.6 mL	400 mg = 0.8 mL		2.4 mg = 1.2 mL		
40 lbs = 18 kg		0.18 mg = 1.8 mL	450 mg = 0.9 mL			3.6 mg = 0.7 mL	
44 lbs = 20 kg	20 mcg = 0.4 mL	0.2 mg = 2 mL	500 mg = 1 mL	**2 mg = 0.4 mL**	3 mg = 1.4 mL	4 mg = 0.8 mL	
48 lbs = 22 kg		0.22 mg = 2.2 mL		**Max Single Dose**	3.3 mg = 1.6 mL	4.4 mg = 0.9 mL	
53 lbs = 24 kg		0.24 mg = 2.4 mL	600 mg = 1.2 mL		3.6 mg =1.8 mL		
55 lbs = 25 kg	25 mcg = 0.5 mL	0.25 mg – 2.5 mL		2.5 mg = 0.5 mL		5 mg – 1 mL	
57 lbs = 26 kg		0.26 mg = 2.6 mL					
62 lbs = 28 kg		0.28 mg = 2.8 mL	700 mg = 1.4 mL		**4 mg = 2 mL**		
66 lbs = 30 kg	30 mcg = 0.6 mL	0.3 mg = 3 mL		3 mg = 0.6 mL	**Max Single Dose**	6 mg = 1.2 mL	
70 lbs = 32 kg		0.32 mg = 3.2 mL	800 mg = 1.6 mL				
75 lbs = 34 kg	34 mcg = 0.7 mL	0.34 mg = 3.4 mL					
79 lbs = 36 kg		0.36 mg = 3.6 mL	900 mg = 1.8 mL	3.6 mg = 0.7 mL		7.2 mg = 1.4 mL	
84 lbs = 38 kg		0.38 mg = 3.8 mL					
88 lbs = 40 kg	40 mcg = 0.8 mL	0.4 mg = 4 mL	1 g = 2 mL	4 mg = 0.8 mL		8 mg = 1.6 mL	
99 lbs = 45 kg		0.45 mg = 4.5 mL	1.12 g = 2.2 mL	4.5 mg = 0.9 mL		9 mg = 1.8 mL	
110-128 lbs / 50-58 kg	**50 mcg = 1 mL**	0.5 mg = 5 mL	1.25 g = 2.4 mL	5 mg = 1 mL		**10 mg = 2 mL**	

Peds CARDIOVERION / 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

ADULT FENTANYL DOSING

Concentration: 100 mcg / 2 mL (50 mcg / mL)
1 mcg/kg (max 100 mcg 1st dose) IV/IN/IO

Elderly (>65), debilitated, SCI; 2nd SOP dose above: 0.5 mcg/kg (max 50 mcg)
Contact OLMC for children < 2 and higher doses

Weight: See peds table above for smaller adults	**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

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

KETAMINE DOSE CHART: Concentration: (50 mg/mL) | Max dose/SOP: 300 mg | Rounded to nearest 10th of a mL							
Weight	PAIN 0.3 mg/kg	Sedation 2 mg/kg (IV/IO)	Sedation 4 mg/kg (IN/IM)	Weight	Pain 0.3 mg/kg	Sedation 2 mg/kg (IV/IO)	Sedation 4 mg/kg (IN/IM)
	Dose mg = mL	Dose mg = mL	Dose mg = mL		Dose mg = mL	Dose mg = mL	Dose mg = mL
6.6 lbs = 3 kg		6 mg = 0.1 mL	12 mg = 0.2 mL	169 lbs = 77 kg	23.1 mg = 0.5 mL	154 mg = 3 mL	308 mg = 6.1 mL
8.8 lbs = 4 kg		8 mg = 0.2 mL	16 mg = 0.4 mL	172 lbs = 78 kg	23.4 mg = 0.5 mL	156 mg = 3.1 mL	312 mg = 6.2 mL
11-13 lbs = 5-6 kg		10-12 mg = 0.2 mL	22 mg = 0.4 mL	173 lbs = 79 kg	23.7 mg = 0.5 mL	158 mg = 3.2 mL	316 mg = 6.3 mL
15-18 lbs = 7-8 kg		14-16 mg = 0.3 mL	30 mg = 0.6 mL	176 lbs = 80 kg	24 mg = 0.5 mL	160 mg = 3.2 mL	320 mg = 6.4 mL
20-25 lbs = 9-11 kg		18-22 mg = 0.4 mL	40 mg = 0.8 mL	179 lbs = 81 kg	24 mg = 0.5 mL	162 mg = 3.2 mL	324 mg = 6.5 mL
26-29 lbs = 12-13 kg		24-26 mg = 0.5 mL	50 mg = 1 mL	182 lbs = 83 kg	24.8 mg = 0.5 mL	165 mg = 3.3 mL	330 mg 6.6 mL
30-36 lbs = 14-16 kg	4.8 mg = 0.1 mL	28 mg = 0.6 mL	56 mg = 1.2 mL	184 lbs = 84 kg	25.2 mg = 0.5 mL	168 mg = 3.4 mL	336 mg = 6.7 mL
37-40 lbs = 17-18 kg	5.4 mg = 0.1 mL	34 mg = 0.7 mL	68 mg = 1.4 mL	187 lbs = 85 kg	25.5 mg = 0.5 mL	170 mg = 3.4 mL	338 mg = 6.8 mL
43 lbs = 19-20 kg	5.7-6 mg = 0.1 mL	38-40 mg = 0.8 mL	78 mg = 1.6 mL	192 lbs = 88 kg	26.3 mg = 0.5 mL	175 mg = 3.5 mL	350 mg = 7 mL
46.2 lbs = 21 kg	6.3 mg = 0.1 mL	42 mg = 0.8 mL	84 mg = 1.8 mL	197 lbs = 90 kg	26.7 mg = 0.5 mL	179 mg = 3.6 mL	358 mg = 7.2 mL
49 lbs = 22-23 kg	6.6-7 mg = 0.1 mL	44-46 mg = 0.9 mL	90 mg = 1.8 mL	200 lbs = 91 kg	27.3 mg = 0.6 mL	182 mg = 3.6 mL	364 mg = 7.2 mL
52-54 lbs = 24 kg	7.2 mg = 0.1 mL	48 mg = 1 mL	96 mg = 2 mL	203 lbs = 92 kg	27.8 mg = 0.6 mL	185 mg = 3.7 mL	370 mg = 7.4 mL
56.5 lbs = 25-26 kg	7.8 mg = 0.2 mL	51 mg = 1 mL	102 mg = 2 mL	209 lbs = 95 kg	28.4 mg = 0.6 mL	190 mg = 3.8 mL	380 mg = 7.6 mL
60.5 lbs = 27-28 kg	8.4 mg = 0.2 mL	54 mg = 1.1 mL	108 mg = 2.2 mL	214 lbs = 97 kg	29.3 mg = 0.6 mL	195 mg = 3.9 mL	390 mg = 7.8 mL
65 lbs = 29-31 kg	9.3 mg = 0.2 mL	60 mg = 1.2 mL	120 mg = 2.4 mL	220 lbs = 100 kg	30.1 mg = 0.6 mL	201 mg = 4 mL	400 mg = 8 mL
71 lbs = 32-33 kg	9.9 mg = 0.2 mL	65 mg = 1.3 mL	130 mg = 2.6 mL	227 lbs = 103 kg	30.9 mg = 0.6 mL	206 mg = 4.1 mL	412 mg = 8.2 mL
78 lbs = 34-36 kg	10.8 mg = 0.2 mL	70 mg =1.4 mL	140 mg = 2.8 mL	231 lbs = 105 kg	31.5 mg = 0.6 mL	210 mg = 4.2 mL	420 mg = 8.4 mL
82.5 lbs = 37-38 kg	11.4 mg = 0.2 mL	75 mg = 1.5 mL	150 mg = 3 mL	233 lbs = 106 kg	31.8 mg = 0.6 mL	212 mg = 4.2 mL	424 mg = 8.5 mL
85-91 lbs = 39-41 kg	12.3 mg = 0.2 mL	80 mg = 1.6 mL	160 mg = 3.2 mL	235 lbs = 107 kg	32.1 mg = 0.6 mL	214 mg = 4.3 mL	428 mg = 8.6 mL
92-95 lbs = 42-43 kg	12.9 mg = 0.3 mL	85 mg = 1.7 mL	170 mg = 3.4 mL	238 lbs = 108 kg	32.4 mg = 0.7 mL	216 mg = 4.3 mL	432 mg 8.6 mL
99 lbs = 44-46 kg	13.8 mg = 0.3 mL	90 mg = 1.8 mL	180 mg = 3.6 mL	241 lbs = 109 kg	32.9 mg = 0.7 mL	219 mg = 4.4 mL	438 mg = 8.8 mL
104 lbs = 47-48 kg	14.4 mg = 0.3 mL	95 mg = 1.9 mL	190 mg = 3.8 mL	242 lbs = 110 kg	33 mg = 0.7 mL	220 mg = 4.4 mL	440 mg = 8.8 mL
110 lbs = 49-51 kg	15.3 mg = 0.3 mL	100 mg = 2 mL	200 mg = 4 mL	244 lbs = 111 kg	33.3 mg = 0.7 mL	222 mg = 4.4 mL	444 mg = 8.9 mL
115 lbs = 52-53 kg	15.9 mg = 0.3 mL	105 mg = 2.1 mL	210 mg = 4.2 mL	249 lbs = 113 kg	33.9 mg = 0.7 mL	226 mg = 4.5 mL	452 mg = 9 mL
121 lbs = 54-56 kg	16.8 mg = 0.3 mL	110 mg = 2.2 mL	220 mg = 4.4 mL	253lbs = 115 kg	34.5 mg = 0.7 mL	230 mg = 4.6 mL	460 mg = 9.2 mL
127 lbs = 57-59 kg	17.4 mg = 0.3 mL	114 mg = 2.3 mL	228 mg = 4.6 mL	260 lbs = 118 kg	35.4 mg = 0.7 mL	236 mg = 4.7 mL	472 mg = 9.4 mL
132 lbs = 60-61 kg	18 mg = 0.4 mL	120 mg = 2.4 mL	240 mg = 4.8 mL	264 lbs = 120 kg	36 mg = 0.7 mL	240 mg = 4.8 mL	480 mg = 9.6 mL
136 lbs = 62 kg	18.6 mg = 0.4 mL	124 mg = 2.5 mL	248 mg = 4.9 mL	270 lbs = 123 kg	36.9 mg = 0.7 mL	246 mg = 4.9 mL	492 mg = 9.8 mL
138 lbs = 63 kg	18.9 mg = 0.4 mL	125 mg = 2.5 mL	250 mg = 5 mL	275 lbs = 125 kg	37.5 mg = 0.8 mL	250 mg = 5 mL	500 mg = 10 mL
141 lbs = 64 kg	19.2 mg = 0.4 mL	128 mg = 2.6 mL	256 mg = 5.1 mL	280 lbs = 127 kg	38.1 mg = 0.8 mL	254 mg = 5.1 mL	Red Labeled Call OLMC to exceed 300 mg
143 lbs = 65 kg	19.4 mg = 0.4 mL	130 mg = 2.6 mL	260 mg = 5.2 mL	286 lbs = 130 kg	39 mg = 0.8 mL	260 mg = 5.2 mL	
145 lbs =66 kg	19.8 mg = 0.4 mL	132 mg = 2.6 mL	264 mg = 5.3 mL	290 lbs = 132 kg	39.6 mg = 0.8 mL	264 mg = 5.3 mL	
148 lbs = 67 kg	20.2 mg = 0.4 mL	135 mg = 2.7 mL	270 mg = 5.4 mL	297 lbs = 135 kg	40.5 mg = 0.8 mL	270 mg = 5.4 mL	
152 lbs = 69 kg	20.7 mg = 0.4 mL	138 mg = 2.8 mL	276 mg = 5.5 mL	301 lbs =137 kg	41.1 mg = 0.8 mL	274 mg = 5.5 mL	
154 lbs = 70 kg	21 mg = 0.4 mL	140 mg = 2.8 mL	280 mg = 5.6 mL	308 lbs = 140 kg	42 mg = 0.8 mL	280 mg = 5.6 mL	
157 lbs = 71 kg	21.3 mg = 0.4 mL	142 mg = 2.8 mL	284 mg = 5.7 mL	313 lbs = 142 kg	42.6 mg = 0.8 mL	284 mg = 5.7 mL	
160 lbs = 72 kg	21.6 mg = 0.4 mL	145 mg = 2.9 mL	290 mg = 5.8 mL	319 lbs = 145 kg	43.5 mg = 0.9 mL	290 mg = 5.8 mL	
162 lbs = 74 kg	22.2 mg = 0.4 mL	148 mg = 3 mL	296 mg = 5.9 mL	325 lbs = 148 kg	44.4 mg = 0.9 mL	296 mg = 5.9 mL	
164 lbs = 75 kg	22.4 mg = 0.4 mL	149 mg = 3 mL	300 mg = 6 mL	330 lbs = 150 kg	45 mg = 0.9 mL	300 mg = 6 mL	

NOREPINEPHRINE drip IVPB/IO- Macro and Microdrip Tubing Flow Rates

Concentration: 4 mg in 1,000 mL NS (4 mcg/mL)

Adult Initial Dosing: 8 mcg/min (2 mL / min) | Pediatric weight adjusted - use IV Pump

Assess BP q. 2 min | As soon as target levels are met, reduce doses incrementally – **Cross Check Dosing**

MACRODRIP TUBING 10 drops/1 mL (2 mL/min = 20 drops | 1 mL/min = 10 drops| 0.5 mL/min = 5 drops)

ADULT		
Mcg/min	**Drops per min**	**Drip rates**
8	20	Every 3 sec
10	25	Every 2.4 sec
ADULT MAINTENANCE		
4	10	Every 6 sec
2	5	Every 12 sec
1	3	Every 20 sec

PEDIATRIC			
PEDS Dosing (0.1 mcg/kg) Concentration: 4 mcg / 1 mL			
Peds weight (lbs-kg)	**Mcg/min**	**Drops/min**	**Drip rates**
154-176 lbs (70-80 kg)	7-8	18-20	Every 3.3 - 3 sec
132-154 lbs (60-70kg)	6-7	15-18	Every 4 - 3.3 sec
110-132 lbs (50-60 kg)	5-6	13-15	Every 4.6 - 4 sec
88-110 lbs (40-50 kg)	4-5	10-13	Every 6 - 4.6 sec
<40 kg Use MICRODRIP tubing see below			

MACRODRIP TUBING 15 drops/1 mL (2 mL/ min = 30 drops | 1 mL/min =15 drops | 0.5 mL/min = 7 drops)

ADULT		
Mcg/min	**Drops per min**	**Drip rates**
8	30	Every 2 sec
10	37	Every 1.6 sec
ADULT MAINTENANCE		
4	15	Every 4 sec
2	7	Every 9 sec
1	4	Every 15 sec

PEDIATRIC			
PEDS Dosing (0.1 mcg/kg) Concentration: 4 mcg / 1 mL			
Peds weight (lbs-kg)	**Mcg/min**	**Drops/min**	**Drip rates**
154-176 lbs (70-80 kg)	7-8	27-30	Every 2.2 - 2 sec
132-154 lbs (60-70kg)	6-7	23-27	Every 2.6 - 2.2 sec
110-132 lbs (50-60 kg)	5-6	19-23	Every 3.2 - 2.6 sec
88-110 lbs (40-50 kg)	4-5	15-19	Every 4 - 3.2 sec
<40 kg: Use MICRODRIP tubing see below			

MACRODRIP TUBING 20 drops/1 mL (2 mL/min = 40 drops | 1 mL/min = 20 drops | 0.5 mL/min = 10 drops

ADULT		
Mcg/min	**Drops per min**	**Drip Rates**
8	40	Every 1.5 sec
10	50	Every 1.2 sec
ADULT MAINTENANCE		
4	20	Every 3 sec
2	10	Every 6 sec
1	5	Every 12 sec

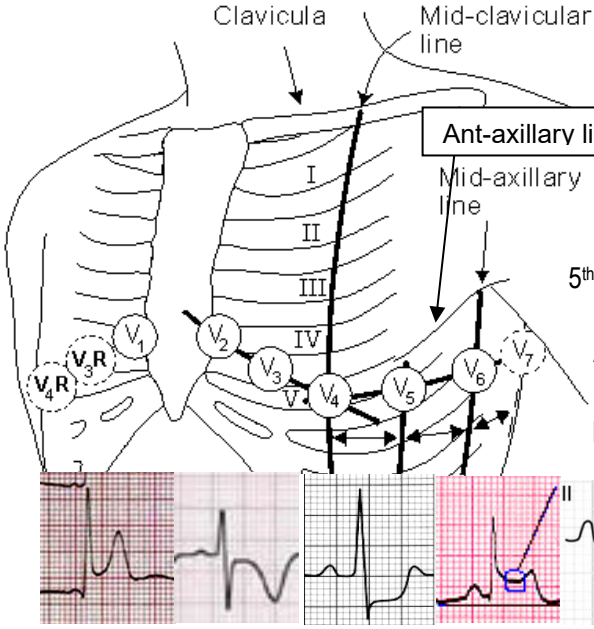
PEDIATRIC			
PEDS Dosing (0.1 mcg/kg) Concentration: 4 mcg / 1 mL			
Peds weight (lbs-kg)	**Mcg/min**	**Drops/min**	**Drip rates**
154-176 lbs (70-80 kg)	7-8	35-40	Every 1.7 - 1.5 sec
132-154 lbs (60-70kg)	6-7	30-35	Every 2 - 1.7 sec
110-132 lbs (50-60 kg)	5-6	25-30	Every 2.4 - 2 sec
88-110 lbs (40-50 kg)	4-5	20-25	Every 3 - 2.4 sec
<40 kg: Use MICRODRIP tubing see below			

PEDIATRIC DOSING ≤ 40 kg - Concentration: 4 mcg / 1 mL – MICRODROP TUBING (60 mcgtts/mL)

0.1 mcg/kg/min (max 1 mcg/kg/min up to 8 mcg/min) **IVPB/IO** ***IV PUMP ONLY*** | Additional doses: OLMC

lbs = kg	0.1 mcg/kg	mcgtts/min	Drip Rates	lbs = kg	0.1 mcg/kg	mcgtts/min	Drip Rates
6.6 lbs = 3 kg	0.3 mcg = 0.07 mL	4 mcgtt/min	Every 15 sec	40 lbs = 18 kg	1.8 mcg = 0.45 mL	27 mcgtt/min	Every 2.2 sec
8.8 lbs = 4 kg	0.4 mcg = 0.1 mL	6 mcgtt/min	Every 10 sec	44 lbs = 20 kg	2.0 mcg = 0.5 mL	30 mcgtt/min	Every 2 sec
11 lbs = 5 kg	0.5 mcg = 0.13 mL	8 mcgtt/min	Every 8 sec	48 lbs = 22 kg	2.2 mcg = 0.55 mL	33 mcgtt/min	Every 1.8 sec
13.2 lbs = 6 kg	0.6 mcg = 0.15 mL	9 mcgtt/min	Every 7 sec	53 lbs = 24 kg	2.4 mcg = 0.6 mL	36 mcgtt/min	Every 1.7 sec
15.4 lbs = 7 kg	0.7 mcg = 0.17 mL	10 mcgtt/min	Every 6 sec	55 lbs = 25 kg	2.5 mcg = 0.62 mL	37 mcgtt/min	Every 1.6 sec
17.6 lbs = 8 kg	0.8 mcg = 0.2 mL	12 mcgtt/min	Every 5 sec	57 lbs = 26 kg	2.6 mcg = 0.65 mL	39 mcgtt/min	Every 1.5 sec
19.8 lbs = 9 kg	0.9 mcg = 0.22 mL	13 mcgtt/min	Every 4.6 sec	62 lbs = 28 kg	2.8 mcg = 0.7 mL	42 mcgtt/min	Every 1.4 sec
22 lbs = 10 kg	1 mcg = 0.25 mL	15 mcgtts/min	Every 4 sec	66 lbs = 30 kg	3.0 mcg = 0.75 mL	45 mcgtt/min	Every 1.3 sec
24.2 lbs = 11 kg	1.1 mcg = 0.27 mL	16 mcgtt/min	Every 3.7 sec	70.4 lbs = 32 kg	3.2 mcg = 0.8 mL	48 mcgtt/min	Every 1.2 sec
26.4 lbs = 12 kg	1.2 mcg = 0.3 mL	18 mcgtt/min	Every 3.3 sec	74.8 lbs = 34 kg	3.4 mcg = 0.85 mL	51 mcgtt/min	Every 1.2 sec
28.6 lbs – 13 kg	1.3 mcg = 0.32 mL	19 mcgtt/min	Every 3.2 sec	79.2 lbs = 36 kg	3.6 mcg = 0.9 mL	54 mcgtt/min	Every 1.1 sec
30 lbs = 14 kg	1.4 mcg = 0.35 mL	21 mcgtt/min	Every 3 sec	83.6 lbs = 38 kg	3.8 mcg = 0.95 mL	57 mcgtt/min	Every 1 sec
33 lbs = 15 kg	1.5 mcg = 0.37 mL	22 mcgtt/min	Every 2.8 sec	88 lbs = 40 kg	4.0 mcg = 1 mL	60 mcgtt/min	Every 1 sec
35 lbs = 16 kg	1.6 mcg = 0.4 mL	24 mcgtt/min	Every 2.5 sec	**Above 88 lbs (40 kg) refer to Macrodrip tubing charts**			

12 Lead Placement



V 1
4th ICS - R of sternum

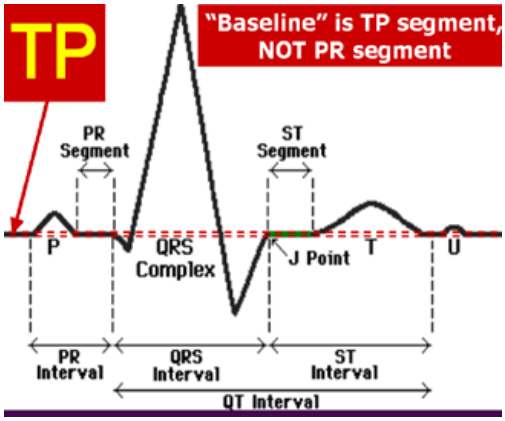
V 2
4th ICS - L of sternum

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



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

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 in ≥2 contiguous leads)
INFARCTION:
Q waves (New or old?) (>0.04 sec; >25% height QRS)

Wellen's Syndrome: Chest pain, now resolved w/
- Bi-phasic T waves in precordial leads (V2)
- Deeply inverted symmetric T waves

STEMI ECG changes – Accessed online from (www.ebmedicine.net/ebmblog/rapid-reference/stemi-ecg/?__s=qphagsrs6iri1frqgmfj)

"Acute MI is historically defined as a clinical syndrome that meets a certain set of criteria, usually a combination of symptoms, ECG changes, and cardiac biomarkers in the proper clinical context." The following is a summary of **ECG criteria used to diagnose ST-elevation myocardial infarction as defined by the Fourth Universal Definition of Myocardial Infarction**.

Standard ECG Definition of STEMI – cardiac alert criteria

- ST elevation at J-point in 2 contiguous leads or >1 mm from prior baseline
  Men < 40: 2.5 mm STE in V2 or V3; 1 mm in any other lead | Men ≥ 40: 2 mm STE in V2 or V3; 1 mm in any other lead
  Women: ≥ 1.5 mm STE in V2 or V3, 1 mm in any other lead

Posterior STEMI

- ST depression in leads V1, V2, V3 (V4?) | Tall, broad R waves (dominant in V2) | Upright T waves
- ST elevation of ≥0.5 mm in any posterior (V7, V8, V9) lead is recommended as the cut-off point. STE ≥1 mm has increased specificity and is recommended as the cut-off point in men aged <40 years.

Left Bundle Branch Block (LBBB)

Original Sgarbossa Criteria: A score > 3 is specific for MI in patients with LBBB
- Concordant ST elevation ≥ 1 mm any leads with a positive QRS = 5 points
- Concordant ST depression ≥ 1 mm in V1, V2, V3 = 3 points
- Excessive discordant ST elevation ≥ 5 mm in leads with a negative QRS complex = 2 points

Smith criteria
Replaced the 3rd item in Sgarbossa's to improve accuracy
- Discordance should be proportional to the QRS with an ST-QRS ratio no greater than 0.20; anything > 0.25 is STEMI
- Removed the point system making all 3 criteria equal. The presence of any single criteria is deemed 80% sensitive and 99% specific in identifying acute MI in known LBBB.

Rule of appropriate discordance: ST segments in all leads should be discordant to the majority direction of the QRS
Concordance: ST segment is in the same direction as the QRS
Discordance: ST segment is in the opposite direction to the QRS | Excessive ST discordance – not normal

RBBB + Fascicular block

Bi-fascicular block – New RBBB w/ Left anterior/Posterior fascicular block
Indicates high-grade LAD or RCA occlusion | Decompensates quickly

Left Main Disease

ST elevation in aVR assoc. w/ ≥ 1 mm ST depression in multiple leads may suggest left main CA stenosis or occlusion

APPROVED Acronyms and Abbreviations

A

AAA. ..... abdominal aortic aneurysm
ACS ..... acute coronary syndromes
ADLs ..... activities of daily living
AED ..... automated external defibrillator
AEMT ..... advanced emergency medical technician
AIDS ..... acquired immune deficiency syndrome
AIVR ..... accelerated idioventricular rhythm
ALS ..... advanced life support
AMA ..... against medical advice
AMI ..... acute myocardial infarction
AMS ..... altered mental status
ANS ..... autonomic nervous system
A&O ..... alert & oriented
AP ..... anterior-posterior
APGAR ..... appearance, pulse, grimace, activity, respirations
ApOx ..... apneic oxygenations/deferred PPV
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
BIAD ..... blind insertion airway device
BP ..... blood pressure
BPM or bpm ..... beats or breaths per minute
BSA ..... body surface area
BSI ..... body substance isolation
BVM ..... bag valve mask

C

Ca ..... calcium
CAD ..... coronary artery disease
CC ..... chief complaint
CKD ..... chronic kidney disease
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
CR ..... cardio-respiratory
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
DTs ..... delirium tremens
d/t ..... due to
Dx ..... diagnosis

E

ECG or EKG ..... electrocardiogram
ECMO ..... extra corporeal membrane oxygenation
ECRN ..... Emergency Communications RN
ED ..... emergency department
EMS ..... Emergency Medical Services
EMS MD ..... EMS Medical Director
EMSS ..... Emergency Medical Services System
EMT ..... Emergency Medical Technician
EOMs ..... extraocular movements
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
g ..... gram
gtts ..... 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

ICH ..... intracranial hemorrhage
ICP ..... intracranial pressure
IDPH ..... Illinois Department of Public Health
ILS ..... intermediate life support
IM ..... intramuscular
IMC ..... Initial Medical Care
IN or NAS ..... intranasal
IO ..... intraosseous
IR ..... intrarectal
ITC ..... Initial Trauma Care
ITD ..... impedance threshold device (ResQPod)
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

LEO ..... law enforcement officer/official
lbs ..... pounds
LLQ ..... left lower quadrant
LMP ..... last menstrual period
LOC ..... level of consciousness
LUQ ..... left upper quadrant
LV ..... left ventricle
LVO ..... large vessel occlusion (type of stroke)

M

mA ..... milliamps (pacing)
MAP ..... mean arterial pressure
MARCH ..... Massive hemorrhage, airway, respirations, circulation, hypothermia (head trauma)
MAT ..... multifocal atrial tachycardia
mcg ..... microgram
mcgtts ..... microdrops
MERCI ..... Medical Emergency Radio Comm. of Illinois
mEq ..... milliequivalent
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
NLS ..... neonatal life support
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
OD ..... overdose
OHCA ..... out-of-hospital cardiac arrest
OP/OPA ..... oropharyngeal airway
Oriented X 1-4 ..... oriented to person, place, time, event
OTC ..... over the counter

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
R/O ..... rule out
ROM ..... range of motion
ROSC. ..... return of spontaneous circulation
RSV ..... respiratory syncytial virus
Rt ..... right
RTS ..... revised trauma score
RUQ ..... right upper quadrant
Rxn ..... reaction

S

SAH ..... subarachnoid hemorrhage
SBP ..... systolic blood pressure
SCI ..... spinal cord injury
SE ..... side effects
SIDS ..... sudden infant death syndrome
SL ..... sublingual
SMR ..... spine motion restriction
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
SUBQ ..... subcutaneous
SUD ..... substance use disorder
SVR ..... systemic vascular resistance
SVT ..... supraventricular tachycardia

T

T ..... temperature
TB ..... tuberculosis
TBI ..... traumatic brain injury
TIA ..... transient ischemic attack
TKO ..... to keep open
Tx or Rx ..... treatment

U

URI ..... upper respiratory infection
UTI ..... urinary tract infection

V

V-fib or VF ..... ventricular fibrillation
VS ..... vital signs
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
yr ..... year

Symbols

α …alpha
@ at
ß beta
° degree
↑ or ↓ increased or decreased
≥ equal to or greater than
≤ equal to or less than
+ positive or plus
# number
~ 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	-	+/-; heavy/tight	-	+/-; sharp/pleuritic
Chest pain duration	-	Varies; usually > 20 min	-	Gradually worsening, then constant
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	+	+ w/ HF/otherwise clear	-	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

- **PMH/**meds for: CVD, CAD, MI, HF, HTN, cardiomyopathy, high cholesterol; ICD, 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)

COPD / Asthma

- **PMH/**meds for: asthma, COPD, chronic bronchitis, emphysema, smoking (steroids, bronchodilators, anticholinergics)
- **Cough: productive** yellow/green
- **S/S respiratory infection: fever, chills, rhinorrhea, sore throat**
- Exposure to known allergen
- **Capnograph**: "sharkfin" waveform
- Wheezes (initially expiratory)

Non-invasive positive-pressure ventilation (NIPPV) / CPAP – per procedure

Primary functions: Provides high flow O_2 and constant positive airway pressures throughout inspiration and expiration

- Improves pulmonary compliance, keeps distal airways open longer to reduce hypercarbia and breath stacking
- Improves alveoli aeration by recruiting and stabilizing collapsed alveoli: ↑ alveolar pressures reverses microatelectasis
- ↑ in oxygen driving pressure facilitates diffusion and improves gas exchange
- Reduces inspiratory work and relieves respiratory muscle fatigue
- ↑ Intrathoracic pressure reduces venous return (preload), transmural pressure, and afterload; ↑alveolar pressures stop further fluid movement into alveoli. Together, these enhance cardiac function and reduce pulmonary edema.

Indications: 18 yrs; alert, can consent, understand & cooperate | intact airway, can clear secretions, good ventilatory effort throughout respiratory cycle | MAP ≥ 60 | Significant distress / Needs NIPPV but NO immediate ADV airway

- DNR/POLST order (advanced disease/terminal illnesses) declining advanced airway
- Elderly if O_2 via NC or NRM is ineffective | Severely obese w/ hypoxia/hypercarbia (obesity hypovent. syndrome)
- Preoxygenation prior to DAI | Post-extubation rescue/acute ventilatory failure
- COPD, asthma | Acute bronchitis; or pneumonia
- HF/cardiogenic pulmonary edema | Post-submersion congestion / ↑ WOB
- Inhalation injury/burn | Toxic inhalation (chlorine
- High SCI with diaphragmatic weakness | Blunt chest wall trauma (flail chest w/o pneumothorax)

Absolute Contraindications: <18 yrs; cardiac/resp. arrest, coma, MAP < 60, requires ADV airway / BVM ventilations

Relative contraindications (consider on case by case basis – may start CPAP and carefully monitor)

- Anaphylaxis meeting MAP indication criteria
- Uncooperative pt or those unable to tolerate mask due to extreme anxiety, claustrophobia, or pain

On-going care/monitoring

Reassess VS; RR / depth / effort & lung sounds, SpO_2, $EtCO_2$ q. 3-5 min after CPAP applied; provide pt. coaching
If BP drops to hypotensive levels for patient; gradually reduce PEEP to 5
If persistent intolerance per procedure and/or MAP < 60: remove CPAP

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. ©2001 Metropolitan Chicago Healthcare Council (MCHC). Content from US Department of Justice and modified by the MCHC CAPES (Clinical, Administrative, Professional & Emergency Services) EMS subcommittee.

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800 Biesterfield
Elk Grove Village 60007
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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
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Fax 847- 573-4282
ED 847- 990-5300
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Fax 847- 842-4247
ED 847- 842-4444
OLMC 847- 381-9525**

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Melrose Park 60160
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Highland Park 60035
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Fax: 847- 480-3964
ED 847- 480-3751
Tele 847- 432-2294

Lake Forest
660 N Westmoreland
Lake Forest 60045
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Fax 847- 535-7801
ED 847- 535-6150
Tele 847- 535-7375

Loyola
2160 S First Ave
Maywood 60153
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Fax 708- 216-2089
ED 708- 216-8705
Tele 708- 343-4844

****LUTHERAN GENERAL**
1775 W Dempster
Park Ridge 60068
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Fax 847- 723-2277
ED 847- 723-5155
OLMC 847- 696-0743**

NM - McHenry
4201 Medical Circle Drive
McHenry 60050
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Fax 815- 363-9044
ED 815- 759-3100
Tele 815- 385-9080

****NWC EMSS Approved OLMC****

****NORTHWEST Community**
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 cell: (847) 493-9974

****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

****Saint ALEXIUS**
1555 N Barrington Rd
Hoffman Estates 60196
Main 847- 843-2000
FAX 847- 755-7602
ED 847- 490-6930
OLMC 847- 843-3508**

St. Joseph
77 N Airlite
Elgin 60123
Main 847- 695-3200
Fax 847- 622-2076
ED 847- 622-2069
Tele 847- 695-5797

NM Woodstock
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**
Advent Heath Glen Oaks	701 Winthrop, Glendale Hts.	Associate	Yes	2	Primary	Yes
Advocate Good Shepherd	450 W Highway 22, Barrington	Associate	Yes	2	Primary	Yes
Advocate Lutheran General	1775 W Dempster, Park Ridge	Resource	Yes	1; replant.	Comprehensive	PCCC
Advocate Sherman	1425 N Randall Road, Elgin	Resource	Yes	2	Primary	Yes
Ascension Alexian Brothers	800 Biesterfield Road, Elk Grove	Associate	Yes	2	Comprehensive	Yes
Ascension Mercy Aurora	1325 N Highland Ave, Aurora	Associate	Yes	2	Primary	Yes
Ascension Resurrection	7435 W. Talcott, Chicago	Associate	Yes	No	Comprehensive	Yes
Ascension Saint Joseph-Elgin	77 N Airlite, Elgin	Resource	Yes	2	Primary	Yes
Ascension Saint. Alexius	1555 Barrington Rd, Hoffman Est	Associate	Yes	2	Primary	Yes
NM Delnor	300 Randall Rd., Geneva	Resource	Yes	2	Primary	Yes
NM Huntley	10400 Haligus Rd, Huntley	Associate	Yes	2	Primary	Yes
NM McHenry	4201 Medical Circle Dr, McHenry	Resource	Yes	2	Primary	Yes
NM Woodstock	3701 Doty Rd, Woodstock	Associate	No	No	Stroke ready	Yes
Northwest Community (NorthShore)	800 W. Central, Arlington Hts.	Resource	Yes	2	Comprehensive	Yes
Rush Copley Med Center	2000 Ogden Ave, Aurora	Associate	Yes	2	Primary	Yes

Region 8 Hospitals	**Location**	**EMS designation**	**STEMI Center**	**Trauma Center**	**Stroke Center**	**EDAP**
Advent Health Bolingbrook	500 Remington Blvd, Bolingbrook	Associate	Yes	2	Primary	Yes
Advent Health Hinsdale	120 N Oak St, Hinsdale	Associate	Yes	2	Primary	Yes
Advent Health LaGrange	5101 S. Willow Springs, LaGrange	Associate	Yes	2	Primary	Yes
Advocate Good Samaritan	3815 Highland, Downers Grove	Resource	Yes	1 (adults)	Primary	Yes
Edward Hospital (NorthShore)	801 S Washington St, Naperville	Resource	Yes	2	Comprehensive	PCCC
Elmhurst Hospital (NorthShore)	York & Roosevelt Rd, Elmhurst	Associate	Yes	2	Primary	Yes
Gottlieb Memorial	675 W. North Ave, Melrose Park	Associate	Yes	2	Stroke ready	Yes
Loyola Medical Center	2160 S. 1st Ave., Maywood	Resource	Yes	1; burn center	Comprehensive	PCCC
Mac Neal Hospital	3249 S Oak Park Ave, Berwyn	Associate	Yes	2	Primary	Yes
NM Central DuPage	25 N. Winfield Rd, Winfield	Resource	Yes	2	Comprehensive	PCCC
Rush Oak Park Hospital	520 S Maple Ave, Oak Park	Associate	Yes	No	Primary	No
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**
Advocate Condell	801 S. Milwaukee Ave, Libertyville	Resource	Yes	1 (adults)	Primary	Yes
NorthShore Evanston	2650 Ridge Ave, Evanston	Associate	Yes	1	Comprehensive	Yes
NorthShore Glenbrook	2100 Pfingston, Glenview	Associate	Yes	2	Primary	Yes
NorthShore Highland Park	777 Park Ave. West, Highland Pk	Resource	Yes	2	Primary	Yes
NorthShore Skokie	9600 Gross Point Road, Skokie	Associate	No	No	No	Yes
NM Lake Forest	660 N Westmoreland, Lake Forest	Resource	Yes	2	Primary	Yes
Ascension St. Francis	355 Ridge Ave; Evanston	Resource	Yes	1	Primary	Yes
Vista Med Center East	1324 N Sheridan Rd, Waukegan	Resource	Yes	2	Primary	Yes

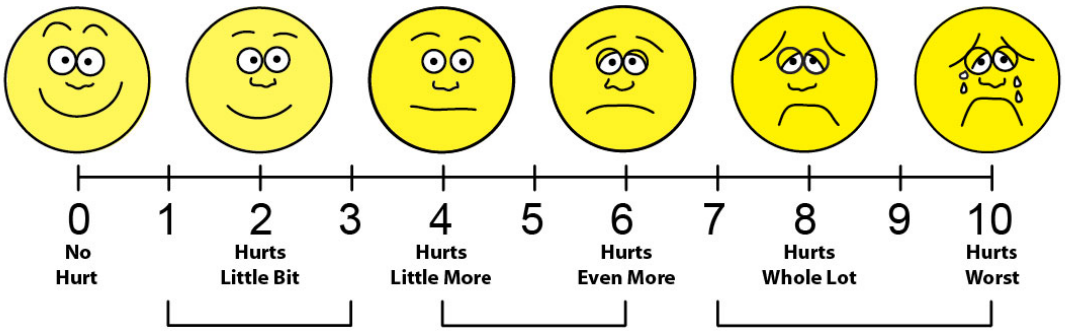
STEMI Center: Able to receive patients with suspected ST elevation myocardial infarctions

EDAP: Emergency Department approved for pediatrics **PCCC**: Pediatrics Critical Care Center

LEVEL III NICU: Central DuPage, Good Samaritan; Loyola, Lutheran General; NW Community; Rush Copley; SAMC

Hospitals with NO OB Services: Ascension St. Joseph Elgin; NorthShore Glenbrook; NorthShore Skokie

Wong-Baker FACES Pain Rating Scale



No pain	Mild pain (1-3)	Moderate pain (4-6)	Severe pain (7-10)	English
Sin dolor	Dolor leve	Dolor moderado	Dolor aguado	Spanish
Schmerzfrei		Ertagbarer schmerz	Unvolistellbarer schmerz	German
Tsis mob	Mob me ntsis	Mob hauj sim	Mob heev	Hmong
No dolore		Dolore moderato	Dolore fortissimo	Italian
Nie bólu		Umiarkowany	Bardzo mocny ból	Polish
Не болит		Умеренная боль	Едва переносимая боль	Russian
Không có dau	Hói dau	Không có dau cho lam	Rât dau	Vietnamese

FLACC Pain Scale (Rev) - Children birth **to 7 yrs. or unable to communicate their pain** **Scores range: 0–10** (0 = no pain) **Rate each criteria as 0, 1 or 2**				**Score**
Category	**0**	**1**	**2**	
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested; sad appears worried	Frequent to constant quivering chin, clenched jaw, disinterested looking face, expression of fright or panic	
Legs	Normal position or relaxed; usual tone and limb motion	Uneasy, restless, tense; occasional tremors	Kicking or legs drawn up; marked increase in spasticity, constant tremors, jerking	
Activity	Lying quietly, normal position, moves easily; reg. rhythmic respirations	Squirming, shifting back & forth, tense; guarded movements, mildly agitated, shallow, splinting respirations, intermittent sighs	Arched, rigid, or jerking; head banging, shivering, breath holding, gasping severe splinting	
Cry	No cry (awake or asleep)	Moans or whispers, occasional complaint, verbal outbursts, constant grunting	Crying steadily, screams or sobs, frequent complaints; repeated outbursts, constant grunting	
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort; pushing caregiver away, resisting care or comfort measures	
			TOTAL	

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					
Interpretation: 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