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, 2015).

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, Amita Saint Joseph Hospital, and Southern Fox Valley EMS Systems to reduce variation in practice and establish a Region-wide System of care.

They shall be used:
- as the 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.
- as the standing medical orders to be used by Emergency Communications Registered Nurses (ECRNs) when providing on-line medical control (OLMC).
- in medium to large scale multiple patient incidents, given that the 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 prehospital 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 in that System.

Patient care is by nature unpredictable. In all circumstances, on line 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 in no way detract from the high level of patient care expected from EMS personnel.

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

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Introduction

Assumptions

1. All EMS personnel will function within their scope of practice as defined by the Illinois EMS Act, IDPH EMS Rules and Regulations promulgated by IDPH Division of EMS & HW Safety, and practice privileges authorized by the EMS MD of the System in which they are working.

2. These SOPs shall be evidence-based and revised as standards of practice or clinical practice guidelines change. They include recommendations from the National Association of EMS Physicians (National Model EMS Clinical Guidelines), Am Heart Association (CPR, ACLS/PALS), Am College of Surgeons (ATLS & PHTLS), Am College of Emergency Physicians (ITLS), Brain Trauma Foundation, Centers for Disease Control and Prevention, Dept. of Health & Human Services, EMS for Children; the National EMS Education Standards, Scope of Practice Model and EMS Core Content.

3. *Italicized options* may not be used in all Systems. Refer to the System-specific SOP documents. Those marked NR are non-region protocols that may or may not be adopted by each System or substituted with a System-specific document.

4. **Levels of acuity:** Definitions match *Model of Clinical Practice of Emergency Medicine; in the Ntl EMS Core Content*: Acuity level is essential for identifying care priorities in EMS setting. They are coded to NEMSIS standards and should be documented as such in the PCR/EHR. **CRITICAL** pts are **TIME-SENSITIVE** with black box notations in the SOPs. **EMERGENT:** 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. **EMERGENCY:** Symptoms of illness or injury may progress in severity or result in complications w/ a high probability for morbidity if treatment is not begun quickly. These may be identified as time-sensitive on a case by case basis. **LOWER ACUITY:** Symptoms of an illness or injury that have a low probability of progression to more serious disease or development of complications.

5. **Stable:** Ability to maintain a steady state of equilibrium with VS that support adequate oxygenation, ventilation, perfusion, & mentation

General guidelines

1. **Abandonment:** EMS personnel shall not knowingly abandon a patient. Abandonment is the unilateral termination of a health professional-patient relationship and/or the unreasonable discontinuation of care by the health care provider when there is still a need for continuing medical attention, contrary to the patient’s will, and/or without the patient’s knowledge. Abandonment for our purposes includes executing an inappropriate refusal, releasing a patient to a less qualified individual, or discontinuing needed medical monitoring before patient care is assumed by other professionals of equal or greater licensure than the level of care required by the patient.

2. **Bus Accident:** Refer to Region policy.

3. **Consent:** Decisional adults must consent to treatment. Consent must be informed or clearly implied via verbal agreement to the treatment or gestures indicating their desire for treatment. A patient’s lack of refusal or physical resistance or withdrawal will be taken as consent.

4. **Consent (Implied):** Patients who are incapacitated so they cannot comply with the above provisions and do not exhibit the ability to make sound judgments, will be treated under implied consent. Patients who are obviously impaired with altered judgment who are unable to understand their decisions, have slurred speech, and/or ataxia; those suffering from mental illness; those who have made *suicidal statements* (to EMS personnel or persons physically present at the scene who will attest to the statements on a petition form) are to be treated under implied consent. They are not allowed to refuse treatment or transport.

5. **Expanded scope:** Expanded scope of practice is System specific as approved by IDPH. See System SOPs and policies.

6. **Minors:** Patients <18 yrs of age should have consent of a parent or guardian obtained prior to treatment unless they qualify as an emancipated minor or for care under implied consent under the Emergency Doctrine. See System-specific policies regarding notification of parent or guardian if they are not immediately available.

7. **Refusals:** Patients who are judged to be legally and mentally decisional have the right to refuse any and all treatment. Patients who are non-decisional may not consent to or refuse treatment. (See System-specific policies)

8. **Treatment of prisoners:** See System specific policies.

9. **Lights and sirens:** Routine use of lights and sirens is not warranted. Pursuant to Illinois Vehicle Code Section 625 ILCS 5/11-1421, the use of visual and audible warning devices from the scene to the hospital is authorized by the EMS MDs for time sensitive patients and in accordance with System policy, unless contraindicated per individual SOP.

10. **Alternative Destination Transports:** Paramedics may conduct advanced assessments of 911 patients with low acuity medical conditions and provide alternative pathways of care other than transport to a hospital-based emergency department, including transport to urgent care centers and clinics, a detoxification center, or mental health hospital. See Initial Medical and Initial Trauma Care and local System policies.
## EMS Scopes of Practice

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

### See local policies/procedures for details

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| - Apply an appropriate pulse oximetry (SpO₂) sensor  
- Blood glucose monitoring | - BLS airway access: position, OPA/NPA  
- Pulse oximetry  
- Obstructed airway maneuvers | - Quality CPR  
- Hemorrhage control: Direct pressure; tourniquet  
- AED use | - Use of backboard  
- Application of C-collar | - ASA for chest pain PO  
- Oral glucose/glucose paste  
- Epinephrine: Assisted administration of pt's autoinjector  
- Epinephrine autoinjector  
- Naloxone IN; autoinjector IM |
| - Capnography monitoring  
- Interpret SpO₂ findings | - Oral suctioning  
- Tracheal-bronchial suctioning of an already intubated pt.  
- Capnography monitoring  
- O₂: NC, mask, NRM, BVM  
- BIPAP, CPAP, PEEP  
- Occlusive dressing applied to a penetrating chest wound  
- Extraglottic airways (NG in gastric port) | - Quality CPR  
- Hemorrhage control: use of hemostatic agents  
- Spiking IV bag; priming tubing for vascular access | - Monitoring of OG/NG tube already inserted  
- Selective spine precautions  
- Splinting/bandaging  
- Vaginal delivery  
- Limb restraints | - Acetaminophen PO  
- Albuterol nebulized  
- Calcium gluconate gel  
- Diphenhydramine PO  
- Ipratropium bromide nebulized  
- Epinephrine (1mg/1mL) IM from ampule or vial  
- Glucagon IM or IN  
- Mark I or DuoDote autoinjector  
- Naloxone IN & IM  
- NTG (chest pain w/ suspected ischemia)  
- Ondansetron ODT |
| - Blood chemistry analysis (point of care testing)  
- ECG rhythm & 12 L interpretation | - Oral suctioning  
- Tracheal-bronchial suctioning of an already intubated pt.  
- Capnography monitoring  
- O₂: NC, mask, NRM, BVM  
- BIPAP, CPAP, PEEP  
- Occlusive dressing applied to a penetrating chest wound  
- Extraglottic airways (NG in gastric port) | - Assess JVD & pulsations  
- Targeted temperature mg after ROSC  
- ALS burn care  
- Protective equipment removal  
- Monitoring indwelling urinary catheter already placed | - Monitoring of OG/NG tube already inserted  
- Selective spine precautions  
- Splinting/bandaging  
- Vaginal delivery  
- Limb restraints | - PO, IN, IM, subq, IVP, IVPB, IO, SL, topical, IR depending on drug  
- Adenosine; Amiodarone  
- Atropine sulfate  
- Benzocaine spray  
- Benzodiazepines  
- Cyanide antidotes  
- Dextrose 10% IVPB  
- Diphenhydramine  
- Epinephrine all concentrations  
- Etoamide/Ketamine  
- Fentanyl, Ketorolac, morphine, Lidocaine 2%  
- Magnesium sulfate  
- Naloxone; Norepinephrine, NTG  
- Ondansetron  
- Sodium bicarbonate  
- Steroids  
- Tetracaine ophthalmic solution  
- Tranexamic acid (TXA)  
- Verapamil  
- Vaccinations in approved program |

### Preparation and administration of drugs by the routes listed for all ages

- **EMR**
- **EMT [BLS]**
- **Paramedic/PHRN [BLS + ALS]**

**Practice privileges are cumulative from EMR to Paramedic**
1. SCENE SIZE UP: Situational awareness; dynamic risk assessment –Assess/intervene as needed:
   - Scene safety; control and correct hazards; remove pt/crew from unsafe environment ASAP; if potential crime scene, make efforts to preserve integrity of possible evidence
   - Nature of illness; scan environment for clues; DNR/POLST orders
   - Universal blood/body secretion & sharps precautions; use appropriate personal protective equipment prn
   - Number of patients; triage / request additional resources if needed. Weigh risk of waiting for resources against benefit of rapid transport to definitive care. Consider if medium or large scale MPI declaration is needed.

2. PRIMARY ASSESSMENT: Establish rapport with patient/significant others
   - General impression: age, gender, general appearance, position, purposeful movements
   - Determine if immediate life threat exists and resuscitate as found
   - Level of consciousness using AVPU or GCS; chief complaint S&S
   - If unconscious, apneic or gasping, & pulseless START QUALITY CPR
   - Treat rate/rhythm/pump/volume/volume distribution disorders per appropriate SOP
   - Transmission of a strip to ALS patients
   - Correct hypoxia/augment ventilation: Target SpO₂: 94%-98% (92% COPD) unless hyperoxia contraindicated
     - O₂ 1-6 L/NC: Adequate rate/depth; minimal distress; SpO₂ 92%-94% (88%-91% COPD)
     - O₂ 12-15 L/NRM: Adequate rate/depth: mod/severe distress; SpO₂ < 92%; (<88% COPD)
     - O₂ 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 ventilation (NIV) for acute respiratory failure (ARF): Consider to prevent respiratory acidosis, to prevent ETI and mechanical ventilation in pts with mild to moderate acidosis and respiratory distress, and as an alternative to invasive ventilation with severe acidosis and more severe respiratory distress - see appropriate SOPs
   - Hyperoxia contraindicated: Uncomplicated Acute MI; post-cardiac arrest; acute exacerbations COPD; stroke; newborn resuscitation. Give O₂ only if evidence of hypoxia; titrate to dose that relieves hypoxemia without causing hyperoxia: SpO₂ 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

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

- **CIRCULATION / PERFUSION / ECG cont.**
  - **Indications for IO:** Pts in extremis urgently needing fluids and/or medications (circulatory collapse; difficult, delayed, or impossible venous access; or conditions preventing venous access at other sites).
    - If conscious: infuse Lidocaine 2% 1 mg/kg (max 50 mg) 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 unusual emergency situation 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/Environmental control; Be considerate of pt modesty; keep pt warm unless specified by protocol
  - **Identify time-sensitive priority transport pts:** Does not authorize accelerated transport speed; emphasizes rapid pt packaging and limiting on-scene time (barring prolonged access) to a minimum (Goal: 10 min or less).

3. **SECONDARY ASSESSMENT:**
   - History and physical exam – tailor to pt presentation & chief complaint
     - **Vital signs:** BP (MAP if able) – Obtain 1st BP manually; trend pulse pressures; orthostatic changes if indicated;
     - Pulse: rate, quality, rhythmicity
     - Respirations: rate, pattern, depth
     - Temp if indicated
     - **Chief complaint (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 level of acuity
       - Head: eyes, ears, nose, throat/neck; jugular venous distention
       - Chest: Symmetry, chest wall movement; deformity, retractions; lung/heart sounds
       - Abdomen/pelvis/GU/reproductive organs: Inspect contour, symmetry; discoloration; pain; changes in function;
         - auscultate bowel sounds; palpate (light); assess for rebound tenderness if S&S peritonitis
       - Extremities: Edema, pulses, discoloration; warmth, pain, motor/sensory changes/deficits
       - Back/flank: pain, discoloration
       - Neurologic: Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; ataxia
       - Skin: color (variation), moisture, temp, texture, turgor, lesions/breakdown; hair distribution; nails (clubbing)

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

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

6. **Pain:** 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/cardioresp. 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 nearest approved hospital by travel time unless preexisting transport patterns exist (trauma, STEMI, stroke, OB, peds) or an exemption applies. Stable pts may be transported to an 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 a pain assessment tool that is age and cognitively appropriate (see last pg. SOP). Consider patient factors: genetics, culture, age, previous pain experiences, comorbidities; responder scope of practice, 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, opiate tolerant or dependent? Is the patient known to be misusing opioids?

**Goal:** Pain is reduced by at least 2 points on the pain scale and/or to tolerable levels (may not reach a rating of 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:** 7Rs of medication administration; independent cross-check

**OPTIONS:** Pharmacologic and non-pharmacologic

- □ BLS: Splinting, distraction, imagery, cold packs, Buzzy (if available)
- □ BLS: Mild-moderate pain - ≥13 years: ACETAMINOPHEN (Tylenol) 650 mg PO if available
- □ ALS: NITROUS OXIDE if available

#### If severe pain (7-10): Opiate 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 single dose 50 mcg) IVP/IN/IM/IO.

**Additional doses require OLMC:** 0.5 mcg/kg q. 5 min up to a total of 3 mcg/kg (300 mcg) if indicated & available

#### Severe pain: Opiate tolerant or dependent or allergy to fentanyl or option if pt. needs mild sedation + pain relief:

**KETAMINE:** 0.2 mg/kg slow IVP (over 1 min) or IN/IM. May repeat X 1 in 20 minutes. See dosing chart in appendix

**Assess and document response to interventions:** Reassess pain, VS, SpO₂, and ETCO₂, GCS, within 5 min after each dose of an opiate or ketamine. If no improvement, adjust regimen or consider need for repeat dosing.

### EMERGENCY DRUG ALTERNATIVES

**Purpose:** To provide alternatives when the primary medications are unavailable due to drug supply shortages.

**Alternatives for pain – see Drug Appendix:** KETOROLAC (pg. 102) MORPHINE (pg. 103)

**DIAZEPAM - Alternative to MIDAZOLAM** for sedation/seizure management

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

**Options for inopressors – See drug appendix for full profiles**

**NOREPINEPHRINE Initial dose:** 8-12 mcg/min (8 mcg=2 mL/min), titrated to reach MAP ≥ 65 (SBP ≥ 90) (MAP ≥ 65).

Retake BP every 2 min from time drug is started until desired BP is reached (don't overshoot), then every 5 min. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min)

- Adults: PUSH DOSE EPI: Instructions: waste 9 mL of Epi 1mg/10mL (cardiac preload); draw up 9 mL NS (10mcg/mL or 1:100,000). Label the syringe. Give 0.5 to 2 mL (5-20 mcg) IVP/IO every 2-3 1-5 minutes reassess after each increment

Titrations up to 20 mcg/kg/min to maintain MAP ≥ 65 (SBP ≥ 90) (MAP ≥ 65)
On-line Medical Control (OLMC)/handover REPORTS

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

GENERAL FORMAT

1. Identification: Hospital being contacted; EMS provider agency and unit #
2. Age, gender of patient
3. Level of consciousness and orientation
4. Chief complaint, nature of call, and prehospital impression including perceived acuity/severity
   Indicate if calling an alert (Trauma, STEMI, Stroke, Sepsis) at this point.
   - Chief complaint (OPQRST); life-threats; degree of distress
   - Associated complaints
   - Pertinent negatives/denials
5. History (SAMPLE)
   - Signs & Symptoms
   - Allergies
   - Medications (current): compliance; time and amount of last dose if applicable
   - Past medical history (pertinent)
   - Last oral intake, last menstrual period if indicated
   - Events leading up to present illness (HPI)
   - Mechanism of injury if appropriate; pertinent scene information; environmental factors, social situation
6. Assessment findings
   - Physical examination; include pertinent positive and negative findings
   - Vital signs – trends if multiple changes
     - BP: auscultated then automated; MAP if known
     - Pulse: rate, regularity, quality, equality
     - Respirations: rate, pattern, depth, effort
     - Temperature if relevant
   - Skin: color, temperature, moisture, turgor
   - Pulse oximetry reading on room air and O2 if indicated
   - Capnography reading and waveform configuration if indicated and available
   - ECG interpretation: Rhythm, 12 L if indicated
   - Blood glucose level; if indicated
   - Glasgow Coma Scale parameters if AMS
7. Treatments initiated (or refused by pt) prior to hospital contact and patient response to treatment
8. Disposition/Destination facility; ETA, update as necessary.

Call update report directly to receiving facility if different from OLMC if changes occur prior to arrival & if time permits.
An EMS “time-out” to allow for an uninterrupted handover report after hospital arrival is useful in ensuring continuity of care especially if a complete written/electronic ePCRs/EHRs are not left/downloaded at the time of pt handoff

ABBREVIATED REPORT

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

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

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

EMS personnel may withhold or cease resuscitative efforts in the following circumstances:
- There is a risk to the health and safety of EMS personnel
- Resources are inadequate to treat all patients (i.e., medium to large scale multiple patient incident)
- Death has been declared by a physician, Medical Examiner or coroner
- A child (< 18 years), where a Court Order is provided to EMS personnel indicating that CPR is not to be commenced

For additional examples see below:

ADVANCE DIRECTIVES

<table>
<thead>
<tr>
<th>IDPH POLST Form</th>
<th>“Practitioner Orders for Life-Sustaining Treatment”: provides guidance during life-threatening emergencies. Must be followed by all healthcare providers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power of Attorney for Healthcare (PoA)</td>
<td>Names agent; rarely contains directions for authorized practitioner</td>
</tr>
<tr>
<td>Mental Health Treatment Declaration</td>
<td>Directions + Agent (for authorized practitioner)</td>
</tr>
<tr>
<td>Living Will</td>
<td>Directions for authorized practitioner (NOT EMS)</td>
</tr>
</tbody>
</table>

1. A valid, completed POLST form or previous DNR order does not expire. A new form voids past ones; follow instructions on most recent form. EMS is not responsible for seeking out other forms - work with form that is presented as truthful.
2. Original form NOT necessary – all copies of a valid form are also valid; form color does not matter
3. **Section A Cardiopulmonary Resuscitation: (no pulse and not breathing)**
   - If "Attempt Resuscitation" box is checked, start full resuscitation per SOP. Full treatment (section B) should be selected
   - If "Do not attempt resuscitation/DNR" box is checked: do not begin CPR
4. **Section B** explains extent/intensity of treatment for persons found with a pulse and/or breathing
   - **Full Treatment:** Primary goal of sustaining life by medically indicated means. In addition to treatment described in selective treatment and comfort-focused treatment, use intubation, mechanical ventilation, and cardioversion as indicated. Transfer to hospital or ICU if indicated.
   - **Selective treatment:** Primary goal of treating medical conditions with selected medical measures. In addition to treatment describe in Comfort-Focused Treatment, use medical treatment, IV fluids and IV medications as medically appropriate, and consistent with pt preference. Do not intubate. May consider less invasive airway support (CPAP/BiPAP). Transfer to hospital if indicated.
   - **Comfort-Focused Treatment:** Primary goal of maximizing comfort. Relieve pain and suffering through the use of medications by EMS-approved routes as needed; use oxygen, suction, manual treatment of airway obstruction. Do not use treatments listed in Full and Selective Treatment unless consistent with comfort goal. Transfer to hospital only if comfort needs cannot be met in current location.
5. **COMPONENTS OF A VALID POLST form/DNR Order:** Region IX recognizes an appropriately executed IDPH POLST form and/or any other written document that has not been revoked; containing at least the following elements:
   - Patient name
   - Resuscitation orders (Section “A”)
   - Date
   - All other information is optional
   - 3 Signatures
   - Patient or Legal Representative signature
   - Witness signature
   - Authorized practitioner name & signature
   - (Physician, licensed resident (2nd yr or higher), APN, PA)
6. **If POLST or DNR form is valid:** follow orders on form. If form is missing or inappropriately executed, contact OLMC.
7. A patient, PoA, or Surrogate that consented to the form may revoke it at any time. A PoA or Surrogate should not overturn decisions made, documented, and signed by the patient.
8. If resuscitation begun prior to form presentation, follow form instructions after order validity is confirmed.
9. If orders disputed or questionable contact OLMC and explain situation; follow orders received.
Withholding or Withdrawing of Resuscitative Efforts cont.

### Injuries/presentations incompatible with life - “Triple Zero”

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

- Decapitation
- Thoracic/abdominal transection
- Massive cranial/cerebral destruction
- Rigor mortis without hypothermia
- Profound dependent lividity

- Decomposition
- Mummification/putrefaction
- Incineration
- Frozen state
- Trauma where CPR is impossible

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

### Power of Attorney for Healthcare (POA)/ Living Wills

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

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

### Hospice patients not in cardiac/respiratory arrest

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

### Termination of Resuscitation (TOR)

A physician’s order is required to stop resuscitation

1. Provide care per SOP based on patient's condition.
3. Criteria to consider:
   - Adult is normothermic and experienced an arrest unwatched by bystanders or EMS;
   - No bystander CPR was provided;
   - The patient has remained in continuous monitored asystole or cardiac arrest with a non-shockable rhythm with no ROSC after full ALS resuscitation in the field for at least 30 minutes;
   - No AED or defibrillator shocks have been delivered for at least 30 minutes;
   - Capnography (if available) has remained ≤ 10 for 20 minutes
   - There are no reversible causes of cardiac arrest identified.
4. A physician may give the order to discontinue medical treatment if determined to be appropriate.
   - Most OLMC physicians will be reluctant to declare TOR in patients ≤12 years
   - If TOR denied, transport with CPR in progress after 30 minutes of resuscitation on scene. Note the time resuscitation was terminated. Follow System policy for patient disposition.
ELDERLY PATIENTS (65 and older)

- Aging reflects loss of function and reserve capacity over time. Physiological aging rates vary—evaluate individually.
- Frail elderly may have impairments with mobility, nutrition, seeing, hearing, and/or cognition; evaluate for possible abuse/neglect.
- Advanced age alone is NOT predictive of poor outcomes & should NOT be used as sole criterion for limiting care.
- Physiologic responses may differ due to changes assoc. w/ aging + comorbidities.
- Can experience significant trauma despite a relatively minor mechanism of injury.
- Advanced age should lower threshold for field triage directly to a trauma center if injured.
- If ≥ 65 years, a GCS ≤ 8 is associated with a poor prognosis. Geriatric pt w/ TBI & GCS <15= same mortality as adult w/ GCS <10.
- Post-injury complications negatively impact survival. Implement therapies to prevent/reduce complications.

1. IMC/ITC special considerations: Rapid airway control; adequate oxygenation; ventilatory support
   - Use SpO2 central sensor (if available) if poor peripheral perfusion (cold hands) or tremors.
   - Pulmonary system: Prone to ventilatory failure (↓ lung compliance, ↓ ability to breathe deeply, ↑ WOB).
   - Consider need for CPAP, advanced airway and/or ventilation w/ BVM if O2 via NC or NRM is ineffective.
   - Blunt thoracic trauma: higher risk for rib fx. Pain control titrated to ventilations & BP.
   - If chronic hypercarbic state (COPD): Manage ventilatory failure w/ acute resp. acidosis carefully.
   - Slowly eliminate only extra CO2 (above chronic norms). Do not hyperventilate and do not over-correct.
   - If rapidly ventilated to an ETCO2 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 Mls, SE of meds; hypovolemia/dehydration; pneumonia; UTI/acute renal failure; stroke, syncope; GI problems, glucose emerg; sepsis/septic shock. Identify cause/correct hypotension/shock/acidosis. May appear “stable” yet have a perfusion deficit due to low CO. Must maintain perfusion to brain & coronary arteries.
   - IV NS up to 1 L: Do not volume overload. Monitor mental status, SpO2, ETCO2, glucose, lung sounds, skin, VS (HR, RR, BP (MAP), pulse pressure, temp); obtain 12-L ECG [if indicated and available].

3. Changes in mentation: Dementia or delirium may lead to late recognition of hypoxia, hypoglycemia, hypothermia, shock, stroke, or TBI. Assess pt’s baseline and time of onset of acute alterations from their normal. Neuro exam can be unreliable for detecting S&S intracranial hemorrhage. KEEP WARM!

4. PMH: ask about medications/compliance: Polypharmacy poses special risks (see drug listing HF SOP)
   - Beta blockers, ACEI, ARBs, Ca blockers, dig may impair ability to compensate for hypoperfusion & hypotension.
   - Anticoagulants can increase systemic or intracranial hemorrhage; notify OLMC ASAP.
   - Benzodiazepine, alcohol, & opioid prescription abuse common; monitor mental/ventilatory status carefully.

5. Accommodate for hearing, visual, cognition, memory, perception, communication, and motor deficits.

6. Handle gently: Bone density losses predispose to fx. Do not log roll. Use sheets or scoop stretcher to lift and move to board/stretcher.

   Carefully assess and provide spine motion restriction for falls per Spine Trauma SOP
   - If placed on spine board: Pad well, protect bony prominences. Inform ED re elderly pt on board.

7. PAIN management: Reduce doses of medication. May be more susceptible to adverse effects (respiratory depression & CV effects). Pts may also have age-related kidney function impairment resulting in lower clearance rates.

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 O2 needs. Oxygenation almost totally dependent on hemoglobin levels. Hypotension carries higher mortality and is a late & unreliable sign of hemorrhage. |
| Cardiac | ↑ afterload leads to ↑ LV wall stress, LV hypertrophy and ↓ LV compliance. Cardiac output ↑ from an ↑ in LV end diastolic volume, not from ↑ in contractile force. Meds (digoxin, beta or Ca blockers) may limit compensatory tachycardia and vasoconstriction normally seen in shock. Reduced heart function increases risk of pump failure in response to physiologic stress, shock and trauma. |
| Renal | Fewer cortical nephrons, ↓ renal function; impairs metabolism and excretion of meds |
| Nervous | ↓ brain mass; eye disease; ↓ depth perception; ↓ pupillary response; ↓ hearing & sense of smell; ↓ responsiveness to ANS & β agonists, ↓ pain perception. Prone to subdural hematomas; brain atrophy may delay S&S; high c-spine inj (C-2 fx) most common; Central cord syndrome more freq d/t hyperextension; nerve damage – peripheral neuropathy. |
Excess weight becomes a health hazard at ≥20% above desirable weight. Obesity is defined as a body mass index (BMI) of at least 30 kg/m². It increases the risk for type 2 DM, cancer, heart disease, HTN, high cholesterol, gallstones, sleep apnea, venous thrombosis, atrial fib, reflux and renal disease, disability, and death. Eating disorders and psychological stigma are also linked to obesity. The leading causes of death among adults with obesity include ischemic heart disease, type 2 DM, 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 to optimally open airway or sit patient up as tolerated.
   - **Secure airway - Advanced airway considerations:** Higher incidence of tube dislodgement; ETCO₂ required
     - Attempt intubation X 1 per procedure; airway size does not change due to obesity
     - If difficult to intubate: Consider nasotracheal approach unless contraindicated
       - Insert alternate airway rather than attempting a difficult intubation
       - Anticipate difficult access for cricothyrotomy
   - **Breathing:** Assessment of lung sounds may be difficult; listen over back first
     - **SpO₂ monitoring:** Can desaturate quickly when flat and be more difficult to monitor
       Consider use of central sensor to better detect oxygenation
     - O₂ by NRM or CPAP (PEEP 5 – 10 cm H₂O); assist w/ BVM (2 person technique) if severe hypoxia or hypercarbia
     - CO₂ retention probable (46–52 mEq/L); monitor ETCO₂ if available
   - **Circulation:**
     - Fluid loading is poorly tolerated
     - Standard peripheral IV approaches may be difficult d/t thickness of sub-q 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
   - **Exposure:**
     - Pannus (abd skin), back, buttocks, and perineum may be difficult to examine; addl. personnel may be needed
     - View as much skin as possible; lift and retract pannus to inspect for wounds, skin ulcers; infections

2. **Secondary assessment:** Use right size BP cuff / consider forearm location; abdominal exam ≤25% accurate; high index of suspicion
   Ask about recent surgery for weight reduction; type/nature (restrictive, malabsorptive or combination; open or laparoscopic); compliance with follow up instructions. High suspicion for dumping syndrome & hypoglycemia.

3. **Medications:** Consider using weight-adjusted dose to avoid sub-therapeutic levels. Contact OLMC for orders.

4. **Transport considerations:** Consider stretcher/spine board wt limits. Request bariatric-equipped vehicle if available.

**Anatomical and Physiologic Changes**

<table>
<thead>
<tr>
<th>Pulmonary</th>
<th>Cardiovascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced pulmonary compliance</td>
<td>↑ blood volume, but as a % of body wt, may be as low as 45 mL/kg</td>
</tr>
<tr>
<td>↑ Chest wall resistance</td>
<td>↑ stroke volume and stroke work index in proportion to body wt</td>
</tr>
<tr>
<td>↑ Airway soft tissue/resistance</td>
<td>↑ cardiac output and metabolic demand</td>
</tr>
<tr>
<td>Abnormal diaphragmatic position</td>
<td>↑ LV volume, which can lead to dilation and hypertrophy</td>
</tr>
<tr>
<td>↓ Diameter of trachea</td>
<td>Atherosclerosis</td>
</tr>
<tr>
<td>↓ Reserve volumes</td>
<td>↓ myocardial compliance up to 35% of normal</td>
</tr>
<tr>
<td>↑ O₂ consumption &amp; CO₂ production</td>
<td>HTN augments pathophysiologic cardiac changes</td>
</tr>
<tr>
<td>Obesity hypoventilation syndrome</td>
<td>Obesity cardiomyopathy syndrome; HF w/ pronounced hemodynamic changes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GI</th>
<th>Musculoskeletal</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑ intraabdominal pressure</td>
<td>Limited mouth opening capacity; short neck with limited mobility</td>
</tr>
<tr>
<td>↑ volume of gastric fluid</td>
<td>↓ ROM; osteoarthritis, chronic pain</td>
</tr>
<tr>
<td>↑ incidence of GERD and hiatal hernia</td>
<td></td>
</tr>
</tbody>
</table>

Region IX Final Mark-up edition 4-22-19
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

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

3. If unconscious:
   - 5 abdominal thrusts (Heimlich maneuver) with victim standing or sitting.
     - If pregnant > 3 months or morbidly obese: 5 chest thrusts.
   - REPEAT IF NO RESPONSE:
   - 3. If successful: complete Initial Medical Care and transport
   - 4. If still obstructed: Continue step #2 while enroute until foreign body expelled or patient becomes unconscious.
     (See below)

UNCONSCIOUS

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

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

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

3. ALS
   - As soon as equipment is available:
     Visualize airway w/ laryngoscope and attempt to clear using forceps or suction.
   - Intubate; attempt to push the foreign body into right mainstem bronchus, pull ETT back and ventilate left lung.
   - If still obstructed and unable to intubate or ventilate adequately:
     - Perform cricothyotomy: ≥13: needle or surgical; children ≤12: needle cric
     - May attempt surgical cricothyotomy in children 8 - 12 only per OLMC
     - Transport; attempt to ventilate with 15 L O₂/BVM
### Purpose DAI: Achieve rapid ETI in patients with intact airway reflexes via use of medications that facilitate intubation.

**Consider indications for advanced airway placement:**
- Actual or potential airway impairment or aspiration risk (trauma, stroke, AMS)
- Acute impending ventilatory failure (HF, pulmonary edema, COPD, asthma, anaphylaxis; shallow/labored effort; SpO₂ ≤ 90; ETCO₂ ≥ 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)
- Inability to ventilate/oxygenate adequately after BLS airways and BVM
- Need for ↑ inspiratory or PEEP to maintain gas exchange
- Need for sedation to control ventilations

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

---

1. **IMC:** SpO₂, evaluate before and after airway intervention; confirm patent IV/IO; ECG monitor
2. **Prepare patient:**
   - Position patient for optimal view and airway access
   - Assess for signs suggesting a difficult intubation
3. **Preoxygenate 3 minutes:** Apply NC 15 L; maintain during procedure – PLUS:
   - IF RR ≥10: O₂ 12-15 L/NRM
   - IF RR ≤10 or shallow: O₂ 15 L/BVM at 10 BPM (To SpO₂ ≥94%)
   - If Hx asthma/COPD: 6-8 BPM to SpO₂ ≥92%. If SpO₂ does not meet these targets, contact OLMC.
4. **Prepare equipment:** BSI, suction (attach rigid tip catheter); drugs & airway equipment (per local procedure)
5. **Premedicate** while preoxygenating
   - Benzocaine spray
   - Pain management if needed: FENTANYL standard dose per Pain SOP if etomidate used for sedation
6. **Sedation** (allow for clinical response before intubating if possible)
   - KETAMINE 2 mg/kg slow IVP (over one min)
   - ETOMIDATE 0.5 mg/kg IVP (max 40) if ketamine contraindicated or unavailable
7. **Place advanced airway** per local procedure: Bougie recommended for ETI if compatible with equipment
   - Monitor VS, mental status, skin color, ETCO₂, SpO₂ q. 5 min. during procedure
   - Assist ventilations at 10 BPM if ↓ RR or depth, ↓ BP, or hypoxic
8. **Confirm tube placement**
   - Ventilate: rate & pressure just to see visible chest rise; auscultate stomach, midaxillary lines; anterior chest
   - Monitor capnography; If ETCO₂ not detected, confirm position with laryngoscopy
9. **If successful**
   - Ventilate at 10 BPM (asthma 6-8); monitor ETCO₂ (35-45); give O₂ to SpO₂ 94% (92% COPD)
   - 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.
   - **Assess need for Postinvasive airway sedation and analgesia (PIASA)**
     - RASS (below). If SBP ≥ 90 (MAP≥ 65):
       - KETAMINE 0.2 mg/kg slow IVP once (If Ketamine not available or adequate sedation not achieved with Ketamine alone; MIDAZOLAM standard dose for sedation)
     - Consider need for FENTANYL (standard dose) if restless/tachycardic and midazolam for post intubation sedation.
     - Continue monitoring ETCO₂ & lung sounds to confirm adequacy of ventilations & tracheal placement
10. **If unsuccessful:** Reoxygenate X 30 sec; repeat steps 7 & 8. Consider need for additional medication.
    - If 2nd ETI attempt unsuccessful or not advised: insert alternate airway; ventilate & monitor as above
11. **Cannot place advanced 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 advanced airway to avoid over and under-sedation**

<table>
<thead>
<tr>
<th>RASS Level</th>
<th>Description</th>
<th>Confirmed Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Comatose</td>
<td>-4</td>
</tr>
<tr>
<td>+3</td>
<td>Unarousable</td>
<td>-5</td>
</tr>
<tr>
<td>+2</td>
<td>Unarousable</td>
<td>-4</td>
</tr>
<tr>
<td>+1</td>
<td>Drowsy</td>
<td>-3</td>
</tr>
<tr>
<td>0</td>
<td>Light sedation</td>
<td>-2</td>
</tr>
<tr>
<td>-1</td>
<td>Moderate sedation</td>
<td>-3</td>
</tr>
<tr>
<td>-2</td>
<td>Deep sedation</td>
<td>-2</td>
</tr>
<tr>
<td>-3</td>
<td>Unarousable</td>
<td>-5</td>
</tr>
</tbody>
</table>

**Goal:** RASS -2 to -3. If higher (not sedated enough) assess for pain, anxiety. Treat appropriately to achieve RASS of -2.
# ALLERGIC Reactions / ANAPHYLACTIC Shock

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; determine if EpiPen used; ask about Anaphylaxis Emergency Action Plan
   - 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 SBP ≥ 90 (MAP ≥ 65)

## 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
- **DIPHENHYDRAMINE** 1 mg/kg (max 50 mg) PO [BLS] or IM (vastus lateralus muscle of the leg / IVP [ALS])

## EMERGENT: Moderate SYSTEMIC Reaction
- SBP ≥ 90 (MAP ≥ 65)
- **EPINEPHRINE** (1mg/1mL) 0.3 mg (mL) IM (vastus lateralus muscle) [BLS]
  - Caution: P > 100, CVD/HTN; on beta blockers, digoxin, MAO inhibitors; or pregnant
  - May repeat in 5 minutes prn; DO NOT DELAY TRANSPORT waiting for a response
- If wheezing: **ALBUTEROL** 2.5 mg & IPRATROPIUM 0.5 mg via HHN/mask. Add O₂ 6 L/NC if SpO₂ <94 [BLS]
- **DIPHENHYDRAMINE** 50 mg IVP; if no IV give IM.

## CRITICAL: Severe SYSTEMIC Reaction / ANAPHYLACTIC SHOCK
- Above plus AMS, decreased/absent lung sounds; severely impaired airway; cardiovascular collapse: HYPOTENSION (SBP <90; MAP <65), dysrhythmias; faintness, syncope, or coma

## IMC special considerations:
- **EPINEPHRINE** (1mg/1mL) 0.5 mg IM (vastus lateralus muscle) while attempting airway & vascular access [BLS]
  - If airway/ventilations severely compromised: Rx per Advanced Airway SOP
  - DO NOT DELAY TRANSPORT waiting for a response

### As soon as vascular access is successful:
- **EPINEPHRINE** (1mg/10mL) titrate in 0.1 mg IVP/IO doses q. 1 min to a total max dose of 2 mg [IM + IV / IO] prn
  - Reassess after each 0.1 mg
  - No IV/IO: May repeat EPI (1 mg/1mL) 0.5 mg IM in 5 min [BLS] Contact OLMC for additional doses
- If on beta blockers & not responding to Epi: **GLUCAGON** 1 mg IVP / IO [ALS] IN / IM [BLS]

### If on beta blockers & not responding to Epi:
- **ALBUTEROL** 2.5 mg & IPRATROPIUM 0.5 mg via HHN/mask. Add O₂ 6 L/NC if SpO₂ <94 [BLS]
- May repeat X 1 enroute. Contact OLMC for additional doses due to long transport time.

### If cardiac arrest occurs – Begin quality CPR; Prolonged CPR indicated while S&S of anaphylaxis resolve
- Start 2nd vascular access line; give IVF as rapidly as possible (up to 20 mL/kg) (use pressure infusers if available)
- **EPINEPHRINE** (1mg/10mL) 0.01 mg/kg up to 1 mg IVP/IO q. 2 min (high dose); Rx dysrhythmias per SOP
# 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, CO₂ narcosis, and cardiac status.
- Current meds: time and amount of last dose; duration of this attack.
- **If wheezing without Hx of COPD/Asthma:** consider FB aspiration, pulmonary embolus, vocal cord spasm, HF/ pulmonal edema. See appendix for differential. **If probable cardiac cause** (PMH: CVD): Rx per Cardiac SOPs.
- Assess for pneumonia, atelectasis, pneumothorax or tension pneumothorax.
- **If tension pneumothorax** (BP, unilaterally absent lung sounds): Needle pleural decompress affected side.
- **Airway/Oxygen:** Assess need for DAI if near apnea, coma or depressed mental status, exhaustion, severe hypoxia (SpO₂ < 90); hypercapnia (ETCO₂ ≥ 60 mmHg); hemodynamic instability, impending respiratory failure or arrest.
- **If chronic hypercarbic state** (COPD): Rx ventilatory failure w/ acute resp. acidosis carefully. Eliminate only extra CO₂ (above chronic hypercarbic norms) causing acute ventilatory failure.
- Do not hyperventilate and do not over-correct. If intubated and rapidly ventilated to ETCO₂ of 35-45, pt may suffer lethal dysrhythmias from Ca binding. Slowly reduce PaCO₂.
- 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 SpO₂: 92%** (COPD)
- If cardiac arrest: **Option:** briefly disconnect from BVM and compress chest wall to relieve air-trapping (Class Ila)
- **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
- Add O₂ 6 L/NC if patient is hypoxic (asthma: SpO₂ < 94%; COPD: SpO₂ < 92%) & using a HHN
- **Begin transport as soon as neb is started.** Do not wait for a response.
- Continue nebulizer therapy enroute. May repeat X 1.

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

### 2. IMC special considerations: [BLS]
Prepare resuscitation equipment; anticipate rapid patient deterioration. If immediate intubation not needed: O₂ /C-PAP 5-10 cm PEEP; use 15 L/NRM or assist w/ BVM if CPAP unavailable or contraindicated
- If SBP falls < 90 (MAP < 65): Titrate PEEP values downward to 5 cm; remove C-PAP if hypotension persists.

<table>
<thead>
<tr>
<th>History of ASTHMA</th>
<th>History of COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. EPINEPHRINE (1mg/1ml) 0.3 mg IM [BLS]</strong></td>
<td><strong>3. ALBUTEROL 2.5 mg &amp; IPRATROPIUM 0.5 mg /HHN/ mask/ BVM</strong></td>
</tr>
<tr>
<td>- Caution: HR &gt; 100, CVD/HTN; on beta blockers, digoxin, or MAO inhibitors; pregnant; or significant side effects to albuterol</td>
<td>Begin transport as soon as neb is started</td>
</tr>
<tr>
<td>- <strong>Begin transport as soon as Epi is given</strong></td>
<td>Do not wait for a response</td>
</tr>
<tr>
<td>- Do not wait for a response</td>
<td>Continue nebulizer therapy enroute</td>
</tr>
<tr>
<td>- May repeat X 1 in 10 min if minimal response</td>
<td>May repeat X 1 as needed</td>
</tr>
<tr>
<td><strong>Follow immediately with</strong></td>
<td><strong>ALBUTEROL 2.5 mg &amp; IPRATROPIUM 0.5 mg via</strong></td>
</tr>
<tr>
<td>ALBUTEROL 2.5 mg &amp; IPRATROPIUM 0.5 mg via HHN, mask or BVM; continue enroute [BLS]</td>
<td>HHN, mask or BVM; continue enroute [BLS]</td>
</tr>
<tr>
<td>May repeat X 1 as needed.</td>
<td>May repeat X 1 as needed</td>
</tr>
</tbody>
</table>

### 4. If severe distress persists:
- **MAGNESIUM** (50%) 2 Gm in16 mL NS (slow IVP/IO) or 50 mL NS IVPB over 5-10 min. Max 1 Gm / minute.
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, SpO₂, ETCO₂ (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; reinflate 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. If no obturator, use pocket bougie.
   - In an emergency, insert an appropriately sized ETT (6.0) 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 O₂ mask over stoma or ventilate peds/infant mask to stoma/15 L O₂/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: Bag/mask over stoma (peds mask); NOT face

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 DISORDERS

INFLUENZA / Possible pneumonia

**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; SpO₂ <95%; HR >100

Standard precautions / Disinfection

1. **For close contact** (within 6 feet of pt with suspected flu): Droplet Precautions and BSI:
   - Nonsterile gloves for contact with potentially infectious material; hand hygiene immediately after glove removal
   - **If fever and coughing:** Surgical mask on pt and mask on each EMS responder (surgical masks, N95, or higher respirator masks) when appropriate.
   - Consider wearing disposable isolation gowns and face shields including eye protection 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:** In ambulance, thoroughly clean all planes and crevices; spray with System-approved disinfectant registered by the EPA to kill viruses (norovirus, rotavirus, adenovirus, poliovirus) 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 called within 24 hours of onset, encourage pt to see 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 complications:** Respiratory failure with severe hypoxemia and hypercarbia may occur in pts with flu-associated pneumonia or exacerbation of underlying airway disease

5. **Give O₂ and bronchodilators/HHN as indicated.** Assist ventilations with 15 L O₂/BVM prn for pneumonia progressing to acute lung injury or ARDS. **Consider need for CPAP with in-line neb** (ALBUTEROL/IPRATROPIUM standard dose)

6. **Assess for sepsis, time-sensitive pt.** Activate exhaust fan during transport

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**Risk factors for serious FLU complications**

- Asthma; Chronic lung disease (COPD; cystic fibrosis)
- Endocrine disorders (e.g. diabetes mellitus)
- Heart disease (congenital heart disease, HF, CAD)
- Kidney, liver, metabolic disorders
- Neurological and neurodevelopmental conditions
- Obesity with a BMI of 40 or higher

- Adults 65 years and older
- Children <5 years old, but especially those <2 years
- Pregnant women and those up to 2 weeks post-partum
- People in nursing homes and long-term care facilities; weakened immune system

**Pulmonary embolism:** Common, 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* (surgery or prolonged immobilization w/in last 30 d); 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 disproportion to fever and tachycardia; ↓ SpO₂; small, square capnography waveform and very low reading (increased dead space and hyperventilation); HR ≥100; cough may be productive with hemoptysis; shock

**IMC** based on the patient presentation, VS, and signs of shock/instability. 12 L ECG, ASA

Definitive Rx of embolus due to blood clot may be fibrinolysis – rapid transport to hospital
## Chest Pain/Acute Coronary Syndrome (ACS) with or w/o pain; ST-segment Elevation Myocardial Infarction (STEMI)

### Chest pain or discomfort in other areas (arm, jaw, epigastrium) of suspected cardiac origin w/ dyspnea, sweating, nausea, vomiting, and dizziness; may be associated with syncope, acute HF, or shock = **medical emergency**.

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

**Silent MIs** Atypical or unusual symptoms without chest pain more common in women, diabetics and the elderly

| Pts presenting with non-STEMI chest pain have a low likelihood of ACS (e.g. blunt trauma to the chest or a pt <30) Derfer aspirin and NTG in these pts unless positive 12L ECG changes; refer to pain mgt guidelines |

1. **Begin immediate IMC**
   - Decrease O₂ demand - limit activity, do not allow to walk; sit up, loosen tight clothing
   - If dyspnea, hypoxemia, or obvious signs of HF, titrate O₂ to achieve SpO₂ of 94%
   - **Cardiac monitor**: assess for rate, rhythm, pump, or volume problem; hypoperfusion & CR compromise Rx per appropriate SOP.
   - Obtain **medication Hx**: inform OLMC if pt taking beta-or calcium channel blockers, clonidine, digoxin, anticoagulants, and 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
   - Contraindications: Drug appendix + confirmed adequate dose taken after symptom onset; chest pain after trauma

3. **12-L ECG. Identify STEMI quickly**; perform with 1st set of VS, w/in 5 min of pt contact - where found
   - Ensure good skin prep; correct lead placement; **good skin interface**; excellent data quality. **If tracing** indicates **AMI** (STEMI): place defib pads per policy
     - Call **STEMI alert ASAP**: Communicate & document: Clinical S&S OPQRST Pt age, gender, DNR status Primary physician/cardiologist if known ECG rhythm and 12 L findings (transmit/download tracing; if unable - read interpretation to OLMC) Meds (see above) PMH of MI, PCI/stent/CABG, renal failure, or contrast allergy (GWG)
     - **Repeat 12L ECGs** at least every 10 min if ongoing pain/symptoms, or clinical deterioration, and transmit.
   - Provide ECGs to treating personnel at receiving hospital

<table>
<thead>
<tr>
<th>NONE to MILD cardiorespiratory compromise + pain/discomfort present</th>
<th>EMERGENT: Moderate cardiorespiratory compromise + pain/discomfort present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert, oriented, well perfused &amp; SBP &gt; 100</td>
<td>Alert, oriented, perfused &amp; SBP 90-100</td>
</tr>
</tbody>
</table>

4. **NITROGLYCERIN** (NTG) **0.4 mg SL** [BLS] (unless contraindicated – see drug appendix)
5. **Complete IMC: IV NS TKO**

<table>
<thead>
<tr>
<th>4.</th>
<th>5.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete IMC: IV NS 200 mL fluid challenge if lungs clear</td>
<td><strong>NITROGLYCERIN 0.4 mg SL</strong> (unless contraindicated) [BLS]</td>
</tr>
</tbody>
</table>

6. **Pain persists & MAP ≥ 65 (SBP≥ 100)** Repeat NTG **0.4 mg SL every 3-5 min X 2**; monitor for hypotension [BLS]
7. **Pain persists & MAP ≥ 65 (SBP ≥ 90)** 3-5 min. after 3rd NTG or NTG contraindicated: **See PAIN SOP (pg. 5)**
8. Observe for clinical deterioration: dysrhythmias, chest pain, SOB, decreased LOC/syncope, shock/hypotension
   - Prepare for CPR and defibrillation

**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) |

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

- **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**: FENTANYL or KETAMINE standard dose per PAIN Mgt. SOP (pg. 5)

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**BLS**

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**Time sensitive pt**
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 (see those SOPs)
2. IMC: Secure airway as needed; O₂ if SpO₂ <94% or pt short of breath
   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
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 cardiorespiratory compromise
Decompensated state with progressive instability related to slow HR and SBP < 90 (MAP <65) AND acute AMS, 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 PVC. Require emergent therapy to avert progression to full arrest.

Drugs vs. Pacing – see below
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 0.5 mg rapid IVP/IO q. 3-5 minutes (max 3 mg) unless contraindicated
   - Contraindications: AVB 2° Mobitz type 2 or 3° w/ wide QRS; transplanted hearts (lack vagal innervation)
   - Use with caution in suspected ACS or MI
   If atropine ineffective/contraindicated
   NOREPINEPHRINE Initial dose: 8-12 mcg/min (2 mL/min), to reach SBP ≥ 90 (MAP ≥ 65).
   Retake BP every 2 min from time drug is started until desired BP is reached (don’t overshoot), then every 5 min.
   Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR
   PUSH EPI: Standard dose per Alternate Drug SOP (pg. 5)

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 standard dose for anxiety/sedation. If condition deteriorating and critical, 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 IN/IM [BLS]
NARROW QRS Complex Tachycardia
w/ 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; 12L per ACS SOP if available (don’t delay therapy); oximetry
   - IV NS TKO in proximal vein (AC); assess blood glucose – treat hypoglycemia per SOP (pg. 34)
   - If unconscious: defer vascular access until after cardioversion

3. **If possible ACS & alert with gag reflex:** Treat Ischemia & pain per ACS SOP (pg.17) ; (NTG contraindicated due to fast HR)

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**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

<table>
<thead>
<tr>
<th>REGULAR R-R</th>
<th>IRREGULAR R-R (AF; A-flutter; MAT) OR PSVT that persists despite Adenosine</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSVT, reentry SVT (PSVT), AT, JT</td>
<td>Note: HR of 120-150 in AF may require drug therapy. Contact OLMC for orders. Do not give to WPW.</td>
</tr>
<tr>
<td><strong>SVT persists:</strong></td>
<td><strong>VERAPAMIL 5 mg SLOW</strong> IVP over 2 min (over 3 min in older patients). May repeat 5 mg in 15 min.</td>
</tr>
<tr>
<td>ADENOSINE 6 mg rapid IVP +10 mL NS flush (Contraindication: asthma)</td>
<td></td>
</tr>
<tr>
<td><strong>SVT persists or recurs w/in 1-2 min:</strong></td>
<td></td>
</tr>
<tr>
<td>ADENOSINE 12 mg rapid IVP +10 mL NS flush</td>
<td></td>
</tr>
<tr>
<td><strong>Rhythm persists:</strong></td>
<td>- Go to irregular R-R</td>
</tr>
</tbody>
</table>

**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

4. **IMC special considerations** in conscious patient:
   - Lungs clear + SBP < 90 (MAP < 65): Consider IV NS fluid challenges in 200 mL increments
   - May give a brief trial of meds (as above) while prepping to synchronize cardiovert if IV placed and time allows
   - **Sedation:** If responsive & SBP ≥ 90 (MAP≥ 65): MIDAZOLAM 5 mg IVP/IN.
     May repeat X 1 up to 10 mg if needed and SBP ≥ 90 (MAP≥ 65). If condition deteriorating, omit sedation.

5. **Synchronized cardioversion** at 50*-100-200-300-360 J (check monitor for specific setting recommendations)
   - If not possible to synchronize and condition critical, go immediately to unsynchronized shocks
   - 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 VT SOP (pg.20)
- DC cardioversion is ineffective in junctional and ectopic atrial tachycardias
- *PSVT & A-flutter often responds to lower energy levels, start with 50 J
WIDE COMPLEX TACHYCARDIA with a PULSE
(QRS 0.12 sec or longer) – VT; SVT with aberrancy, WPW; torsades de pointes

1. Assess for hypoperfusion, cardiorespiratory compromise, acidosis
2. IMC: Support ABCs as needed
   Obtain, review and transmit 12-lead ECG per ACS SOP if available; determine rhythm & stability ASAP
   If unconscious: defer vascular access until after cardioversion
3. If possible ACS & alert with gag reflex: ASPIRIN per ACS SOP (pg. 17)

Low Acuity to EMERGENT: None to moderate cardiorespiratory/perfusion compromise
Alert, HR > 150, SBP > 90 (MAP > 65), no evidence of tissue hypoperfusion or shock

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 pointes):

4. AMIODARONE 150 mg mixed with 7 mL or 100 mL NS slow IVP or IVPB over 10 min. May repeat.
   Complete dose even if rhythm converts.
   OLMC may order additional medications

5. Chest pain: NTG per ACS SOP if HR drops to 100 or less. If pain persists: Fentanyl or Ketamine per PAIN SOP (pg. 5)

CRITICAL: Severe cardiorespiratory/perfusion compromise (unstable)
Instability must be related to HR > 150: Altered sensorium, SBP < 90 (MAP < 65), shock, pulmonary edema, HF, or ACS. Immediate cardioversion seldom needed for HR < 150.

4. Sedation: If responsive & SBP ≥ 90 (MAP≥ 65): MIDAZOLAM 5 mg IVP/IN.
   May repeat X 1 up to 10 mg if needed and SBP ≥ 90 (MAP≥ 65). If condition deteriorating, omit sedation.

5. All but torsades (see above): Synchronized CARDIOVERSION starting at 70-100-J (manufacturer-specific)
   Torsades de pointes: DEFIBRILLATE at device & AED specific J see below
   If not possible to synchronize and clinical condition critical, go immediately to unsynchronized defibrillation
   - Assess ECG and pulse after each shock delivery
   - Treat post-cardioversion dysrhythmias per appropriate SOP

VT persists
6. AMIODARONE 150 mg mixed with 7 mL or 100 mL NS slow IVP/IO or IVPB over 10 min
   Do not give amiodarone to patients with Torsades, AV blocks, IVR or ventricular escape beats

7. Synchronized cardioversion at device specific J after ½ of the Amiodarone dose (75 mg)
   Complete the medication dose even if pt converts after cardioversion, provided SBP ≥ 90 (MAP ≥ 65)

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

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Adult Synch Cardioversion J</th>
<th>Adult Defib J</th>
</tr>
</thead>
<tbody>
<tr>
<td>LifePak 12 &amp; 15</td>
<td>100-150-200-300-360</td>
<td>200-300-360</td>
</tr>
<tr>
<td>Philips</td>
<td>100-150-200</td>
<td>150</td>
</tr>
<tr>
<td>Welch-Allyn</td>
<td>100-150-200-300-360</td>
<td>200-300-360</td>
</tr>
<tr>
<td>Zoll all series</td>
<td>70 or 75-120-150-200</td>
<td>120-150-200</td>
</tr>
</tbody>
</table>

Defibrillator energy recommendations for VT
### CARDIAC ARREST (VF/PVT/Asystole/PEA) Adult & Peds

**General expectations:**
- Use “Pit crew” or “Team” approach and bundles of care to resuscitate pt. per SOPs/local policy/procedure.
- All care is organized around 2 minute cycles in C-A-B priority order unless arrest is caused by hypoxic event
- Multiple steps may be done simultaneously if personnel/resources allow
- **Continue resuscitation at point of contact for at least 30 min.** Exceptions: dangerous environment/adverse climate; pt is in need of intervention not immediately available on scene (PTCA, REBOA, ECMO); penetrating and blunt trauma (refer to Traumatic arrest SOP); obvious pregnancy; or ROSC occurs.

**Determine UNRESPONSIVENESS:** manually open airway; assess breathing/gasping; SUCTION prn  
**Simultaneously:** Attempt to determine down time: Electrical (0–5 min); Circulatory (6–10 min); Metabolic (> 10 min) phases.

### CPR

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assess pulse:</strong></td>
<td>If not definitively felt in &lt;10 sec: Determine if CPR is contraindicated: DNR, Triple Zero? Blunt trauma? If DNR status is unclear, start CPR; stop if valid POLST is presented or per OLMC order</td>
</tr>
<tr>
<td><strong>Discontinue LifeVest® batteries; remove vest if present; DO NOT disconnect VAD batteries</strong></td>
<td></td>
</tr>
<tr>
<td><strong>If pulseless &amp; VAD placed:</strong></td>
<td>✗SpO₂. See VAD SOP; Call VAD Coordinator for instructions</td>
</tr>
<tr>
<td><strong>If indicated,</strong></td>
<td>Begin high perfusion minimally interrupted CPR with MANUAL COMPRESSIONS per guidelines within 10 seconds of arrest recognition. Use audible prompt to ensure correct rate.</td>
</tr>
<tr>
<td><strong>Use a real-time CPR feedback device until an automated CPR device is deployed</strong></td>
<td></td>
</tr>
<tr>
<td><strong>As soon as possible (13 and older),</strong></td>
<td>Transition to an approved automated CPR device (if available and meets protocol) to maintain uninterrupted chest compressions. Pause compressions &lt; 5 sec to place device.</td>
</tr>
<tr>
<td><strong>Ideally – pause or D/C CPR device only for TOR or ROSC; see approved pauses below</strong></td>
<td></td>
</tr>
<tr>
<td><strong>If no CPR device available or is contraindicated:</strong></td>
<td>Continue 2 person CPR (adult, child, infant)</td>
</tr>
</tbody>
</table>

### APNEIC OXYGENATION: 13 and older (first 6 minutes unless contraindicated)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insert NPA/OPA; place nasal cannula ETCO₂ sensor at 15 L O₂/BVM at 15 L O₂ immediately</strong></td>
<td>after initiating CPR</td>
</tr>
<tr>
<td><strong>Exceptions:</strong> cardiac arrest caused by hypoxic event (asthma, anaphylaxis, submersion etc.) and/or peds: Early O₂/BVM with ETCO₂ indicated for these pts.</td>
<td></td>
</tr>
<tr>
<td><strong>As able:</strong></td>
<td>Place SpO₂ central sensor; observe (trend) reading and pleth waveform</td>
</tr>
</tbody>
</table>

### APPLY DEFIB PADS without interrupting compressions as soon as available:

**RHYTHM:** Cardiac monitor [ALS]/AED [BLS]  
- **CPR DEVICE + monitor senses ECG:** No pause unless cannot determine rhythm  
- **NO CPR DEVICE or monitor does not sense ECG:** Palpate femoral pulse for 5 sec while compressions in progress; pause compressions ≤ 5 sec. Resume compressions immediately.  
  If can’t ID rhythm during pause; print strip during pause; resume compressions. Read ECG from printed strip.

### NOT SHOCKABLE: Resume compressions immediately  
**SHOCKABLE?** Deliver device specific shock:

<table>
<thead>
<tr>
<th>JOULES</th>
<th>PERI-SHOCK PAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult/child ≥50 kg:</td>
<td>Device-specific joule setting</td>
</tr>
<tr>
<td>Child &lt; 50 kg:</td>
<td>4 J/kg not to exceed 10 J/kg max adult dose. (chart in appendix)</td>
</tr>
<tr>
<td>WITH CPR device:</td>
<td>None</td>
</tr>
<tr>
<td>NO CPR device:</td>
<td>≤ 5 sec</td>
</tr>
</tbody>
</table>

**NO CPR DEVICE:** Without checking ECG or pulse, change compressors and resume compressions (≤ 5 sec)  
- NO rhythm/pulse check until after 2 min of CPR unless evidence of ROSC  
- Continue to assess - Defibrillate shockable rhythms per above procedure in 2 minute cycles

<table>
<thead>
<tr>
<th>Equal but separate priorities</th>
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<tbody>
<tr>
<td>Advanced Airway</td>
<td>Vascular access</td>
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</table>

**ADVANCED Airway – without interrupting compressions [ALS]**
- Place extraglottic airway (i-gel) or ETT per local procedure when safely able; (no OLMC needed for i-gel)  
- Confirm placement with 5 point auscultation; ETCO₂: secure tube, stabilize head and neck

**REGULATE INTRATHORACIC PRESSURE (Age 13 and older)**
- After advanced airway: VENTILATE adult at 10 BPM (asthma 6-8 BPM); child (1 breath every 6 sec) with volume only to see visible chest rise and hear bilateral breath sounds midaxillary lines with continuous chest compressions.
**VASCULAR ACCESS:** IV/IO per procedure: NS TKO; when placed, give meds with no interruption in compressions

**DRUGS**

**EPINEPHRINE** (1mg/10mL) Repeat every 6 min as long as CPR continue
- **Adult:** 1 mg IVP/IO. If cardiac arrest occurs with anaphylaxis: high dose epi per SOP (pg. 13)
- **Peds:** 0.01 mg/kg (0.1 mL/kg) (Max 1 mg) IVP/IO. See dose chart in appendix.

**If SHOCKABLE RHYTHM:**
- **AMIODARONE**
  - **Adult:** 300 mg IVP/IO
  - **After 5 min:** Adult: 150 mg IVP/IO
- **Peds:** 2.5 mg/kg IVP/IO (Max 150 mg)

**If persistent/refractory VF:**
- Change defib pad location to A-P and defibrillate per procedure.
- If 2 monitors available: consider **dual sequential defibrillation** at device-specific joule settings

**As time allows:** Consider **Hs & Ts** (Rx appropriately)

**Hypoxia (ventilate/O₂)**
- Hypothermia (core rewarm)
- Hypovolemia/dehydration (IVF boluses)
- Hypo/hyperkalemia & H ion (bicarb-responsive acidosis (DKA/TCA/ASA OD, cocaine, diphenhydramine): 1 mEq/kg up to 50 mEq IVP/IO
- Hypoglycemia *finger stick accucheck may be inaccurate in patients in cardiac arrest or shock. Consider checking venous blood from IV site for more accurate reading.

**Return of spontaneous circulation (ROSC):** Rapid, sustained rise in ETCO₂; pt moves; wakes up

- Assess VS; ECG, SpO₂, ETCO₂ q. 5 min
- Palpate pulse & watch SpO₂ pleth for 5 minutes to detect PEA
- Support ABCs: Target normal oxygenation (avoid hyper or hypoxia), normocapnia, and normal BP (Goal MAP 90-100)
- Assist ventilations prn; do not hyperventilate even if ↑ ETCO₂; titrate O₂ to SpO₂ 94%.
- **BP support** is a high priority: Start 2nd IV if needed
- Reassess q. 2 min until desired BP reached, then every 5 min. Don’t overshoot target BP

**Adults:** If MAP < 65 (SBP < 90): IV WO while prepping:

**NOREPINEPHRINE 8-12 mcg/min** (2 mL/min IVPB).
- Titrate to MAP 90-100: 2 to 4 mcg/min (0.5 mL to 1 mL/min)
  - **PUSH DOSE** EPI or Dopamine in **alpha dose**

**Peds:** If SBP <70: IV WO while prepping

**NOREPINEPHRINE 0.1 mcg/kg/min** (max 8 mcg/min)
- IVPB
  - Titrate to SBP > 70 + (2X Age)

**TARGETED TEMPERATURE MANAGEMENT (TTM) after ROSC**

If patient remains unresponsive to verbal commands w/o contraindications: Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees

**TERMINATION OF RESUSCITATION (TOR)**

If normothermic pt. remains in persistent monitored asystole for ≥30 minutes despite steps above, and if ETCO₂ remains ≤ 10 mmHg for 20 min & no reversible causes of arrest are identified, seek OLMC physician’s approval for TOR.

Most OLMC physicians will be reluctant to declare TOR in patients ≤12 years

If TOR denied, transport with CPR in progress after 30 minutes of resuscitation on scene.

**Adult Defibrillator energy recommendations**

<table>
<thead>
<tr>
<th>Manufacturer</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Stryker PhysioControl LifePak 12 &amp; 15</td>
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<tr>
<td>Philips HeartStart MRx</td>
<td>150/170/200</td>
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<td>Zoll all series</td>
<td>120-150-200</td>
</tr>
</tbody>
</table>

If ICD is delivering shocks, wait 30-60 sec. for cycle to complete. Place pads at least 1” from implanted device.
HEART FAILURE / PULMONARY EDEMA

- Assess for hypoperfusion and cardiorespiratory compromise. **12 L ECG obtained and transmitted**
- Differentiate HF from COPD/asthma by PMH, meds, S & S, capnography if available (See appendix p. 112).
- **Consider cause:** rate, rhythm, volume, or pump problem; treat per appropriate SOP based on etiology.
- Auscultate lung sounds all lobes, front & back; report timing/location of wheezes/crackles

**Low Acuity to EMERGENT:** Mild to Moderate cardiorespiratory/perfusion compromise (SBP ≥ 90 and DBP ≥ 60) (MAP ≥ 65)

1. **IMC special considerations:**
   - Position patient sitting upright at 90° (if tolerated); dangle legs over sides of stretcher
   - **C-PAP:** 5-10 cm PEEP; If SBP falls < 90 (MAP < 65): Titrate PEEP down to 5 cm; remove if hypotension persists.
   - If respiratory distress and CPAP contraindicated, not tolerated, or unavailable: Assess need for advanced airway [ALS]; O₂ 15 L/NRM

2. **ASPIRIN 324 mg** (4 tabs 81 mg) PO per ACS SOP unless contraindicated

3. **NITROGLYCERIN** 0.4 mg SL; If SBP remains ≥ 90 (MAP ≥ 65): Repeat NTG 0.4 mg every 3-5 min – no dose limit. May be given if HR > 100 in pulmonary edema

4. Severe anxiety and SBP ≥ 90 (MAP ≥ 65): **MIDAZOLAM** standard dose for anxiety per ACS SOP (pg. 17)

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

<table>
<thead>
<tr>
<th>Time sensitive pt</th>
</tr>
</thead>
</table>
| 1. **IMC special considerations:**
  - Assess need for advanced airway to ↓ work of breathing, protect airway, or ventilate patient
  - Assess for hypovolemia/dehydration
| 2. If hypovolemic and/or dehydrated - **lungs clear** and ventilations unlabored:
  - **NS IVF in 200 mL increments up to 1 L**; attempt to achieve SBP ≥ 90 (MAP ≥ 65). Frequently reassess lung sounds.
  - **NOREPINEPHRINE** Initial dose: 8 mcg/min (2 mL/min), to reach SBP ≥ 90 (MAP ≥ 65). **Push dose EPINEPHRINE;**
  - 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): candesartan (Atacand), eprosartan (Teveten), irbesartan (Avapro), losartan (Cozaar), olmesartan (Benicar), telmisartan (Micardis), valsartan (Diovan)

**Angiotensin Receptor-Nephrilysin Inhibition (ARNI):** Sacubitril/valsartan; Ivabradine

**Anticoagulants:** apixaban (Eliquis), aspirin, argatroban, bivalirudin (Angiomax), clopidogrel (Plavix), dabigatran (Pradaxa), enoxaban (Savaysa/Lixiana), epibatidine (Integrilin), lepirudin (Refudan), presugrel (Effient), rivaroxaban (Xarelto), ticagrelor (Brilinta), ticlodipine (Ticlid), warfarin (Coumadin, Jantoven); Sub-q route: dalteparin (Fragmin), enoxaparin (Lovenox), fondaparinux (Arixtra), tinzapar (Innohep); Heparin (IV & sub-q)

**Beta Blockers:** acebutolol (Sectral), atenolol (Tenormin), betaxolol (Betoptic,Kerlone), bisoprolol (Zebeta), carvedilol (Coreg), esmolol (Brevibloc), labetalol (Normodyne, Trandate), levobunolol (Betagan), metoprolol (Lopressor/Toprol), Kappspargo Sprinkle (metoprolol succinate extended-release), nadolol (Corgard), pimobutol, pindolol (Visken), propranolol (Inderal), timolol (Blocadren, Timoptic), sotalol (Betapace)

**Calcium channel blockers:** amiodipine (Norvasc), felodipine, diltiazem (Cardizem), nicardipene (Cardene), nifedipine (Procardia, Aadalat), verapamil (Calan, Isoptin)

**Diuretics:** amiloride (Midamor), bumetanide (Bumex), chlorothiazide (Diuril), diazide, furosemide (Lasix), hydrochlorothiazide (Hydrodiuril), indapamid (Lozol), metolazone (Zaroxolyn), Polythiazide, torsemide,

**Vasodilators:** hydralazine (Apresoline), isosorbide dinitrate (Isordil), minoxidil (Loniten), nesiride (Natrexor), Nitrate/NTG

**Aldosterone antagonists:** (K sparing diuretics) Eplerenone, spironolactone (Aldactone); triamterene (Dyrenium)
Left Ventricular Assist Device (VAD)

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

The current generation of LVADs 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 LVAD 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 or may not have a peripheral pulse or normal BP at any time; SpO₂ 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 LVADs may tolerate sustained ventricular arrhythmias with minimal hemodynamic instability because the LVAD 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 and record nature & amount of vomiting/diarrhea, jaundice; vomiting precautions
   - Adjust IV rate to maintain hemodynamic stability
   - Document OPQRST of the pain; menstrual history in females of childbearing age; last BM; orthostatic VS; travel history
   - Rx per PAIN Mgt SOP (pg. 5)

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
3. Possible kidney stone: if available and unless contraindicated
   KETOROLAC 15 mg IVP or 30 mg IM (do not give if suspected pregnancy)

EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise
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
4. Acute and active GI bleed: may seek OLMC order for TXA 1 Gm in 100mL NS IVPB over 10 min

DIALYSIS / Chronic Renal Failure Emergencies
Vascular access in dialysis patients is often through an AV fistula or graft (a surgical connection of an artery and vein). This access is the patient's lifeline, take meticulous care to protect it.
1. IMC special considerations:
   - BPs, venipunctures, and IVs should NOT be performed on an extremity with a shunt
   - If patient unresponsive: Vascular access by IO
   - When emergencies occur during dialysis, the staff may leave access needles in place, clamping the tubing.
     If this is the only site, request their assistance to connect IV tubing.
2. Treat per appropriate SOP and with special considerations listed below

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

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

Suspected significant HYPERKALEMIA with cardiotoxicity or cardiac arrest (CRITICAL)
Wide QRS w/ tall, peaked T wave, flattened or absent P waves, prolonged PRI, sine-wave pattern, IVR, asystolic cardiac arrest; high index of suspicion if patient is on lisinopril (retains K)
2. Treat dysrhythmias per appropriate SOP with 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. Do NOT give magnesium sulfate to these patients.
1. **IMC** special considerations:
   - Do not assume that the smell of alcohol automatically means intoxication; consider alternative causes of impaired behavior/motor incoordination
   - Assess **mental status** and cognitive functioning per AMS SOP (pg. 27)
     - If GCS 8 or less: Assess need for DAI or alternate advanced airway
   - Assess **hydration status**: If dehydrated: sequential IV NS 200 mL fluid challenges
   - Assess for hallucinations, delusions, tremors
   - Ask patient about time and amount of last alcohol ingestion

2. If combative or uncooperative, attempt verbal means to calm patient; seek law enforcement assistance and/or use restraints per System policy

3. Evaluate for evidence of **motor impairment** and deficits in coordination (ataxia); nystagmus

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

5. If **altered mental status**, **seizure activity**, or **focal neurologic deficit**:
   - Obtain blood glucose level (per local policy/procedure) [BLS]
     - If < 60 or low: **DEXTROSE** per Glucose emergencies SOP (pg. 34)
     - If unable to start IV: **GLUCAGON** 1 mg IM/IN [BLS]
     - If borderline (60-70): **DEXTROSE** per Glucose emergencies SOP (pg. 34)
   - Observe and record response to treatment; recheck glucose level; may repeat Dextrose prn.
     - If 70 or greater: Observe and continue to assess patient

6. **Alcohol withdrawal symptoms** - S&S may appear within 8 hrs of last drink, peak 1-2 days; last for 5 days:
   - Nausea/vomiting; tachycardia, tremors (arms extended, fingers spread apart), sweating, anxiety, agitation/irritability, tactile disturbances (itching pins and needles, burning, numbness, bugs crawling on or under skin), auditory or visual disturbances (hallucinations); disorientation & clouding of sensorium; headache/fullness in head.
   - **Tremors** or **Delirium tremens** (mental confusion, constant tremors, fever, dehydration, P > 100, hallucinations).
   - If SBP ≥ 90 (MAP ≥ 65):
     - **MIDAZOLAM** 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg IVP/IN titrated to pt response.
     - If IV/IO unable/IN contraindicated: **IM** 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
     - All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
     - If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants:
       - ↓ total dose to 0.1 mg/kg.


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

<table>
<thead>
<tr>
<th>AMS: Consider possible etiologies; use appropriate SOPs</th>
<th>H: Head injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Alcohol and ingested drugs/toxins; ACS/HF, arrhythmias, anticoagulation</td>
<td>E: Epilepsy</td>
</tr>
<tr>
<td>E: Endocrine/exocrine, particularly thyroid/liver; electrolyte/liquid imbalances; ECG abnormalities; prolonged QT; Brugada syndrome (incomplete RBBB pattern in V1/V2 w/ ST segment elevation)</td>
<td>A: Aneurysm</td>
</tr>
<tr>
<td>I: Insulin disorders: hypoglycemia; DKA/HHS</td>
<td>D: Drugs/psychiatric causes</td>
</tr>
<tr>
<td>O: Oz deficit (hypoxia), opiates, overdose, occult blood loss (GI/GU)</td>
<td>H: Hypoxia or heart disease</td>
</tr>
<tr>
<td>U: Uremia; other renal causes including hypertensive problems</td>
<td>E: Embolism</td>
</tr>
<tr>
<td>T: (recent) Trauma, temperature changes</td>
<td>A: Arrhythmia</td>
</tr>
<tr>
<td>I: Infections, both neurologic and systemic; infarction</td>
<td>R: Respiratory (hyperventilation or breath-holding)</td>
</tr>
<tr>
<td>P: Psychological; massive pulmonary embolism</td>
<td>T: Thoracic outlet syndrome</td>
</tr>
<tr>
<td>S: Space occupying lesions (epi or subdural, subarachnoid hemorrhage, tumors); stroke, shock, seizures</td>
<td>V: Vasovagal</td>
</tr>
</tbody>
</table>

**Syncope differential**

**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**
- Affect: Behavior: consolable or non-consolable agitation
- Cognitive function (ability to answer simple questions); hallucinations/delusions
- Memory deficits; speech patterns
- Inspect for Medic alert jewelry, tags, body art
- Consider vulnerability factors: older age, dementia, functional impairment, malnutrition, substance use disorder
- General appearance; odors on breath; evidence of alcohol/drug abuse; trauma
- VS: observe for abnormal respiratory patterns; ↑ or ↓; orthostatic changes
- Skin: Lesions that may be diagnostic of the etiology
- Neuro exam: Pupils/EOMs; visual deficits; motor/sensory exam; for nuchal rigidity; Cincinnati EMS stroke screen
- Pain: Facial expression, body movements, muscle tension, vocalization.

1. **IMC special considerations:**
   - Suction prn; seizure/vomiting/aspiration precautions
   - GCS 8 or less: Intubation (DAI) or alternate advanced airway needed? Local policy/procedure
   - SBP < 90 (MAP < 65) & lungs clear: **NS IVF challenges** (consecutive 200 mL increments); monitor lung sounds
   - Position patient on side unless contraindicated
   - If supine: maintain head and neck in neutral alignment; do not flex neck
   - **Consider need for 12 L ECG** if Hx of presyncope or syncope; monitor ECG; Rx dysrhythmias per SOP
   - Monitor for S&S of ↑ ICP; reduce environmental stimuli
   - Document changes in GCS & VS

2. Obtain and record blood glucose level
   - **< 70 or low:** DEXTROSE per Glucose emergencies SOP (pg. 34)
     - Unable to start IV: **GLUCAGON 1 mg IN/IM** [BLS]
     - Observe and record response to treatment; recheck glucose level; may repeat Dextrose prn.
   - **If 70 or greater:** Observe and continue to assess patient

3. **Possible opiate toxicity** w/ AMS & respiratory depression/arrest: **NALOXONE 1 mg** IVP/IO [ALS] IN/IM [EMR/BLS]
   - May repeat q. 30 sec until breathing adequate up to 4 mg. All additional doses require 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 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.
### DRUG OVERDOSE / POISONING

**GENERAL APPROACH**

1. **History:** Determine method of injury: 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, SpO₂ and ETCO₂ in all pts with AMS or given sedatives.**
   - Assess need for advanced airway if GCS ≤ 8, aspiration risk, or airway compromised unless otherwise specified
   - Support ventilations w/ 15L O₂ if respiratory depression, hypercarbic ventilatory failure
   - Large bore IV/IO NS titrated to adequate perfusion (SBP ≥90; MAP ≥ 65); monitor ECG
   - Impaired/nondecisional patients may not refuse treatment/transport

3. **AMS, seizure activity, or focal neurologic deficit:** Assess **blood glucose;** If < 70: treat per Hypoglycemia SOP (pg. 34)

#### Possible opiate toxicity
- If IV/IO unable/IN contraindicated - IM: 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose
- All routes: May repeat to total of 20 mg prn if SBP≥ 90(MAP≥ 65) unless contraindicated.
- If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or have taken opiates, alcohol, or CNS depressants: ↓ total dose to 0.1 mg/kg (½ normal dose) for anxiety.

#### Anxiety/surotonin syndrome:
- **MIDAZOLAM** 2 mg slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg titrated to response
- If IV/IO unable/IN contraindicated - IM: 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose
- All routes: May repeat to total of 20 mg prn if SBP≥ 90(MAP≥ 65) unless contraindicated.
- If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or have taken opiates, alcohol, or CNS depressants:
  - ↓ total dose to 0.1 mg/kg (½ normal dose) for anxiety.

#### Excited delirium/violent/severe agitation: **KETAMINE**
- 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM (max 500 mg)

### 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 IN/IM [EMR/BLS]

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

5. **Hypotension:** IV/IO NS wide open to 1 L

6. **Wide QRS:** SODIUM BICARBONATE 1 mEq/kg IVP.
   - Repeat if ↓ BP, deterioration of mental status, wide QRS persists, or dysrhythmias.

### DEPRESSANTS: **Barbiturates:** Phenobarbital, Seconal (secobarbital)! **Benzodiazepines:** diazepam (Valium), midazolam (Versed), lorazepam (Ativan), Librium, flunitrazepam (Rohypnol) - Generally 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

7. **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).

- **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).

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

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

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

**INHALANTS:** Caustic gasses, vapors, fumes or aerosols. Ex: Gases - CO, NH₄ (ammonia), chlorine, freon, carbon tetrachloride, methyl ether gas, must gas, nitrous oxide; spray paint (particularly metallics); household chemicals like cooking spray, furniture polish, correction fluid, propane, mineral spirits, nail polish remover, aerosol propellants, glue, oven cleaners, lighter fluid, gasoline and solvents.

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

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

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

4. AMS and RR < 12 (pupils may be small): **NALOXONE standard dose (above)**

5. Assess need for restraints; monitor for HTN after opiate is reversed if speedballs are used

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

4. Remove from contaminated area; decontaminate as much as possible before moving to ambulance.

5. **ATROPINE 1 mg rapid IVP/IO.** Repeat q. 3 minutes until reduction in secretions. May need large doses – usual dose limit does not apply. Cholinergic poisonings cause an accumulation of acetylcholine. Atropine blocks acetylcholine receptors, thus inhibiting parasympathetic stimulation. Also see Chemical Agents SOP.

**STIMULANTS:** Amphetamines: Benzedrine, Dexedrine, Ritalin, Methamphetamine (crystal, ice); ECSTASY: "Molly" - MDMA (methylene-dioxy-methamphetamine), designer drug used at "rave" parties with stimulant and hallucinogenic properties. Produces feelings of increased energy and euphoria and disturbs 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. Sympathomimetic effects (↑ HR, BP & Temp; diaphoresis; agitation; hallucinations and psychotic S&S

4. Supportive care; prepare to secure pt safety with restraint if necessary

Treat tachycardia, dysrhythmias, cardiac ischemia, and hyperthermia per appropriate SOP.

5. **If generalized tonic clonic seizure activity, anxiety, severe HTN:** MIDAZOLAM (see general approach)

6. **If excited delirium, violent, severe agitation:** KETAMINE (see general approach)

7. If hallucinations: quiet environment devoid of stimulation (lights, noise and touch)
CARBON MONOXIDE POISONING

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
   - O₂ 12-15 L/NRM or BVM; ensure tight seal of mask to face; SpO₂ 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 have 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
   - Severely confused, but hemodynamically stable or obviously pregnant:
     Consider transport directly to facility with a hyperbaric chamber (OLMC order).
     CRITICAL: If in respiratory/cardiac arrest or airway unsecured: transport to nearest hospital

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

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CYANIDE EXPOSURE (CRITICAL) Adults & Peds

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 (pg. 21-22) 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 gm 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 gm – see dosing chart below
   - May repeat X 1 and response inadequate to 1st dose. Max total dose 10 g.

   Peds dosing: Hydroxocobalamin

<table>
<thead>
<tr>
<th>Wt/kg</th>
<th>Dose</th>
<th>Unit</th>
<th>Volume</th>
<th>Vol / min</th>
<th>Wt/kg</th>
<th>Dose</th>
<th>Unit</th>
<th>Volume</th>
<th>Vol / min</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>140</td>
<td>mg</td>
<td>5.6 mL</td>
<td>22 mcgtts</td>
<td>20</td>
<td>1.4</td>
<td>Gm</td>
<td>56 mL</td>
<td>3.7 mL</td>
</tr>
<tr>
<td>3</td>
<td>210</td>
<td>mg</td>
<td>8.4 mL</td>
<td>34 mcgtts</td>
<td>25</td>
<td>1.8</td>
<td>Gm</td>
<td>70 mL</td>
<td>4.6 mL</td>
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<tr>
<td>4</td>
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<td>45 mcgtts</td>
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<td>2.1</td>
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<td>Gm</td>
<td>112 mL</td>
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<tr>
<td>15</td>
<td>1.1</td>
<td>Gm</td>
<td>42 mL</td>
<td>2.8 mL</td>
<td>45</td>
<td>3.2</td>
<td>Gm</td>
<td>126 mL</td>
<td>8.4 mL</td>
</tr>
</tbody>
</table>

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

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ILLINOIS POISON CENTER #: 1-800-222-1222  www.illinoispisoncenter.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.
   - Immense in warm water (90°-105° F) if available
   - May use hands/hot packs wrapped in a towel. Use warming mattress if available.
   - HANDLE SKIN GENTLY like a burn. Do **NOT** rub. Do not break blisters.
   - Protect with light, dry, sterile dressings; cover with warm blankets and prevent re-exposure
3. Anticipate severe pain when rewarming: **Nitrous Oxide, Fentanyl** or **Ketamine:** standard dose per **PAIN** SOP (pg. 5)

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

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

**MILD/MODERATE Hypothermia** (Lower acuity to EMERGENT)

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

**Moderate:** Core temp 82.4-90.6° F (28-32°C): Lethargy, bradycardia, arrhythmias, shivering ceases <31°C (87.8°F); slowed speech/ataxia (mimics stroke), muscle rigidity, slow RR, CO2 retention, pupils dilated & minimally responsive

2. **Passive rewarming** generally adequate for pts w/ T > 93.2° F: Cover with blankets; protect head from heat loss.

   - **Active external rewarming** (T 82°-93.2° F): Continue passive + apply surface warming devices (wrapped hot packs to axillae, groin, neck, & thorax; warming mattress if available). Passive rewarming alone inadequate for these pts.

3. Warm NS IVF challenges in 200 mL increments (Peds: 10 mL/kg) to maintain hemodynamic stability

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

2. **ITC** special considerations:
   - Core rewarming (not generally available in field). Rewarm trunk only with hot packs; avoid rewarming extremities
   - **Consider need for advanced airway:** If indicated; use gentle technique to prevent vagal stimulus and VF
   - **O2** 12-15 L/NRM or BVM (warm to 42°C / 107.6°F if possible); do **NOT** hyperventilate - chest will be stiff
   - **Vascular access:** Warm NS 200 mL (peds 10 mL/kg) IVP/IO fluid challenges up to 1 L
     - Will require large volume replacement due to leaky capillaries, fluid shift, and vasodilation as rewarming occurs
   - **Time sensitive pt**

3. If unresponsive with no breathing or no normal breathing (only gasping) check for a pulse.
   - Pulse not definitely felt in **30** seconds: Start CPR - **TRIPLE ZERO CANNOT BE CONFIRMED** in these patients
   - Treat per CARDIAC ARREST SOP concurrent with rewarming;

4. **ROSC:** Support CV status per CARDIAC ARREST SOP (pg.21-22); look for & treat causes of severe hypothermia
   - If induced hypothermia indicated: Continue to warm to goal temp of 34°C / 93.2°F
   - If hypothermia contraindicated (trauma patient); continue rewarming to normal temp

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

1. **ITC special considerations:**
   - **Rescue and removal:** Ensure EMS safety during the rescue process; only rescuers with appropriate training and equipment should enter moving or deep water to attempt rescue
     - Rescue personnel should wear protective garments if water temp is < 70˚
     - A safety line should be attached to the rescue swimmer
     - Patient should be kept in a horizontal position if at all possible. Cold-induced hypovolemia, cold myocardium, and impaired reflexes may result in significant hypotension. If hypothermic, appropriate rewarming should be done concurrent with resuscitation.
   - Spine motion restriction only if circumstances suggest a spine injury
   - **Emergent:** If awake with good respiratory effort, yet congested and increased work of breathing:
     - \(\text{O}_2/C-PAP\) mask to deliver 5-10 cm PEEP; use 15 L/NRM if CPAP unavailable or contraindicated
     - If SBP falls < 90 (MAP < 65) or hypotensive for age: Titrate PEEP down to 5 cm; remove C-PAP if \(\downarrow\) BP persists
   - **Critical:** If unresponsive and ineffective ventilations with a pulse:
     - Ventilate using BLS airways and BVM. Clear airway of aspirated water with suction. Abdominal thrusts contraindicated.
     - Pts usually respond after a few ventilations. Consider need for advanced airway if patient does not respond to initial bag and mask ventilations.
   - **Critical:** If unresponsive, apneic and pulseless:
     - CPR using traditional A-B-C approach due to hypoxic nature of arrest. Rx per appropriate SOP.
     - Vomiting is common in those who require compressions & ventilations; prepare suction
     - Remove wet clothing; dry patient as possible – especially the chest before applying pads and defibrillating pt
     - If pt is cold: refer to HYPOTHERMIA SOP

2. Evaluate for ↑ ICP: (↑ SBP, widened PP; \(\downarrow\) pulse, abnormal respiratory pattern, gaze palsies, HA, vomiting)
   - If present; treat per **Head Trauma SOP**
3. **Enroute:** Complete ITC: IV NS TKO [ALS]

**Diving-related emergencies**

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

**ITC special considerations:**
- Position supine or in recovery position
- Consider transport to a hyperbaric chamber: See Carbon Monoxide Poisoning SOP for chamber locations.
- If assistance is needed: **Divers Alert Network (DAN) (919) 684-8111**
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, and transport
   Do NOT massage cramped muscles

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

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 pg. 3-4)
   - 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

1. **IMC** special considerations:
   - Anticipate ↑ ICP; check 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** challenge in consecutive 200 mL increments (peds 10 mL/kg) 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:**
   - Obtain PMH; type of diabetes; assess for presence of insulin pump; glucose monitoring devices
   - Determine time and amount of last dose of diabetic medication/insulin and last oral intake
   - Obtain/record **blood glucose** (bG) level on all pts with 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:** Confusion to coma; seizures; inability to swallow; cold limbs

### 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. **GCS 14 or 15 and able to swallow:** Oral glucose in the form of paste, gel, tabs, or sugar-containing liquid if available

3. **If bG is borderline 60-70:**
   - DEXTROSE 10% (25 g/250 mL) IVPB rapidly (wide open) – infuse up to **12.5 grams** (125 mL or ½ IV bag)
     - If S&S of hypoglycemia fully reverse and pt becomes decisional after partial dose, reassess bG
     - If >70: close clamp to D10% and open NS TKO

4. **If bG < 60** (no S&S pulmonary edema – if lungs congested see cautions):
   - DEXTROSE 10% (25 g/250mL) 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

5. **Assess patient response 5 minutes after dextrose administration:** Mental status (GCS) and bG level
   - If bG 70 or greater: Ongoing assessment
   - If bG less than 70: Repeat D10% in 5 gram (50 mL) increments at 5-10 min intervals.
     - Reassess bG and mental status every 5 min after each increment.

6. **If no IV/IO:** GLUCAGON 1 mg IN/IM – [BLS]

5. If decisional pt refuses transport after bG normalized: advise pt. to eat & call PCP before EMS leaves scene.

### DIABETIC KETOACIDOSIS (DKA) or HHNS (CRITICAL)

**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

**DKA presents with all 3**

**Hyperosmolar hyperglycemic nonketotic syndrome (HHNS):** T2DM, or those who present with very high glucose levels and severe dehydration, but no acidosis or ketosis

EMS personnel shall not assist any patient in administering insulin

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

- 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 require rapid antihypertensive medications

S&S:
- Hypertensive urgency: headache, epistaxis, faintness, and psychomotor agitation
- Hypertensive emergency: Causes and S&S suggesting end-organ dysfunction
  - Neurologic damage due to hypertensive encephalopathy, stroke, subarachnoid hemorrhage, 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, eclampsia. Assess for seizures, peaked T waves, hematuria.
  - Ask about drug use (cocaine toxicity); consider if S&S excited delirium present.

1. IMC special considerations: Treat the patient, not the number
   - 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; GCS and neuro signs; repeat q. 15 min or if changes occur
   - Assess for Hx of trauma, HTN, CVD, ACS, aortic aneurysm, renal disease, 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 standard dose per PAIN SOP (pg. 5)

HYPERTENSIVE EMERGENCY (SBP > 160) plus

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

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 (pg. 38-39)
   - Keep patient as quiet as possible; reduce environmental stimuli
   - If GCS ≤ 8: Assess need for DAI
   - 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 (pg.17) [BLS] X1 - 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 (pg. 70)

5. Continue treating per appropriate SOP based on etiology and clinical S&S.
SCENE AND PERSONAL SAFETY. Call law enforcement if needed; always position self for a safe exit.

- **Vigilant situational awareness.** Assess risk factors and warning signals for verbal or written threats, threatening behavior (shaking fists, intentionally slamming doors, punching walls, destroying property, vandalism, sabotage, theft, or throwing objects), physical attacks or assaults (hitting, shoving, biting, pushing or kicking. Extremes include rape, arson, and murder).
- Inspect environment for clues suggesting substance use; suicide notes
- General patient appearance; odors; inspect for Medic alert jewelry; impairment; trauma
- Ask patient, family/bystanders about history (if known) and recent behavioral changes.

**IMC** Special considerations

1. Maintain safe distance from patient until consent to touch given unless immediate intervention/restraint indicated. Do not touch patient without telling them your intent in advance.
2. Limit stimuli and number of people around and treating patient as safely possible, isolate if necessary.
3. Rapidly assess for medical or behavioral conditions that could cause S&S:
   - **Medical etiologies** - treat per SOP:
     - Hypoxia (√ SpO₂); hypoperfusion; substance use disorder (alcohol intoxication; drugs)
     - Neuro: stroke, seizure, cerebral bleed, delirium, dementia (Alzheimer’s dx), developmental impairment, autism
     - Metabolic disorders: hypoglycemia (√ glucose), acidosis (√ ETCO₂), electrolyte imbalance, thyroid/liver/renal dx
     - Trauma
4. Establish rapport and provide emotional reassurance. Verbally attempt to calm and reorient patient as able. Do not reinforce delusions or hallucinations.
5. Avoid threatening or ALS interventions or restraint unless necessary for patient safety.
6. Protect patient from harm to self or others. Psychiatric patients must be protected when demonstrating suicidal ideation or harm to others by using safety measures such as continuous visual observation (CMS).

**Assess patient’s decisional capacity**

Ability to understand and appreciate the nature and consequences of a decision regarding medical treatment 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). A non-decisional patient may not consent to nor refuse care. Rx under implied consent.

Can be influenced by medications, pain, time of day, depression, mood, medical or mental illness.

**Tests to determine decisional capacity**

- **Alertness (GCS) and orientation:** A&O X 4 (person, place, time, situation); attention span
- **Speech:** Speaking in full sentences with normal rate, volume, articulation and content
- **Affect:** Mood and emotional response consistent with environmental stimuli?
  - Note evidence of rage, elation, hostility, depression, fear, anger, anxiety
- **Behavior:** Note body language (posture, gestures). Is the patient able to remain in control?
- **Cognition:** Intellectual ability/thought processes. Note if confused, delusional, or not making sense.
- **Insight:** Can the patient appreciate the implications of the situation and consequences of their decision? Do they understand relevant information? Can they draw reasonable conclusions based on facts? Can they communicate a safe and rational alternative choice to recommended care?

**S&S assessment tip:** CAST-A-MOP

- **Consciousness/arousal using GCS, attention span**
- **Activity:** restlessness, agitation, compulsions
- **Speech:** rate, volume, articulation, content
- **Thinking/thought processes:** delusions, flight of ideas, obsessions, phobias
- **Affect and mood:** appropriate or inappropriate
- **Memory:** immediate, recent, remote
- **Orientation X 4, understands and complies with instructions**
- **Perception:** delusions, hallucinations (auditory, visual, tactile)

See local policies for further explanation of decisional capacity assessment.
Suicide Screen: Explore risk of suicide/harm to others (current, recent, or lifetime SI attempts); mitigating factors/support systems. Bring suicide notes to hospital.

Possible RISK FACTORS for suicide
- Mental or emotional disorders, particularly depression and bipolar disorder
- Previous suicide attempts or self-inflicted injury
- History of trauma or loss (abuse as a child, a family history of suicide, bereavement, or economic loss)
- Serious illness, or physical or chronic pain or impairment: alcohol and drug abuse
- Social isolation or a pattern/history of aggressive or antisocial behavior
- Discharge from inpatient psychiatric care, particularly within first weeks and months after discharge
- Access to lethal means coupled with suicidal thoughts

Always ask questions #1 & #2

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

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 & O2 tubing.

If combative and/or uncooperative:
- Attempt verbal de-escalation. If unsuccessful: Provide chemical and/or physical restraint per procedure.
- Use only enough force to protect patient and/or EMS personnel
  - Restraint should not be unnecessarily harsh or punitive. Document reasons for use
- In an emergency, apply restraints; then confirm necessity with OLMC
- Ensure adequate airway, ventilations, and peripheral perfusion distal to restraint after application
  - Monitor respiratory and circulatory status

If non-decisional and/or a threat to self or others and/or unable to care for themselves
- DO NOT LEAVE ALONE: remain in direct constant surveillance until handover to medical personnel.
- Complete Petition Form for all adults who meet above criteria
  - Persons who witnessed statements or behaviors should sign the form
- If Refusing transport: Make every effort to gain consent for transport
  - Call OLMC from scene. Transport pt. against their will with use of restraint if necessary.
  - Ask law enforcement for assistance with restraint and/or transport if needed

Anxiety and SBP ≥ 90 (MAP ≥ 65) or normal for age: MIDAZOLAM standard dose for anxiety/sedation: adult and peds
If suspect use of alcohol, opiates or CNS depressants: ↓ total dose to 0.1 mg/kg

Excited delirium, violent, severe agitation: KETAMINE standard dose (adult and peds)
See Appendix for rapid dosing option and dose chart. Use with caution in patients with active psychosis

Document on ePCR
- Who called EMS? Why?
- Patient’s account of what happened
- Drugs/medications (compliance, last dose)
- Screenings/assessments performed and results: including risk factors & Suicide Screen results
- Interventions (type and nature of restraint)
- Any challenges encountered during the run
- Assessment of patient’s access to lethal means of harm to self or others
- Types of violence: verbal or physical; nature of physical violence
- Communication with family, supports
- Pt’s stated preferences regarding Rx if different from EMS
- Concerns and actions taken to mitigate these concerns
1. IMC special considerations:
   - History of present illness/ PMH / complete BEFAST STROKE SCREEN – next page
   - **Attempt to determine baseline status:** dementia, pre-existing limitations/deficits, able to care for self?
   - Support ABCs as needed; O₂ if SpO₂ < 94% or O₂ sat unknown; avoid hypoxia and hyperoxia
   - Seizure/vomiting precautions; suction prn
   - Maintain head/neck in neutral alignment; do not use pillows
   - Monitor ECG; acquire 12L if possible
   - IV (enroute) unless hypoglycemia, need for DAI; 18 g AC Pre-CT. Avoid multiple attempts/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** per System procedure
   - If < 70 or low reading: DEXTROSE / Glucagon per Hypoglycemia SOP

4. **Minimize scene time** (< 10 minutes) - transport to the nearest PSC/CSC per Stroke Checklist next page

5. **Call Stroke Alert** to OLMC ASAP – One or more criteria BEFAST screen or other assessments is positive

### Characteristics of stroke

<table>
<thead>
<tr>
<th>Prodromal warning</th>
<th>Thrombosis</th>
<th>Embolism</th>
<th>Intracerebral Hemorrhage</th>
<th>SAH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>No</td>
<td>No</td>
<td>Rare</td>
<td></td>
</tr>
<tr>
<td>Onset during sleep</td>
<td>Sometimes</td>
<td>Rare</td>
<td>Rare</td>
<td>Rare</td>
</tr>
<tr>
<td>Development</td>
<td>Gradual</td>
<td>Sudden</td>
<td>Gradual or sudden</td>
<td>Sudden</td>
</tr>
<tr>
<td>Quick reversal</td>
<td>Possible</td>
<td>Possible</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Decreased concussion</td>
<td>Mild</td>
<td>Mild</td>
<td>Severe</td>
<td>Moderate</td>
</tr>
<tr>
<td>Headache</td>
<td>Mild</td>
<td>Mild</td>
<td>Severe</td>
<td>Severe</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Common</td>
<td>Possible</td>
<td>Not always</td>
<td>Common</td>
</tr>
<tr>
<td>Nuchal rigidity</td>
<td>No</td>
<td>No</td>
<td>Sometimes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vomiting</td>
<td>Rare</td>
<td>Rare</td>
<td>Sometimes</td>
<td>Sometimes</td>
</tr>
</tbody>
</table>

### Brainstem or posterior stroke
- **5 Ds:** Dizziness, Diplopia, Dysarthria, Dysphagia (chewing & swallowing), Dystaxia (incoordination)
- Severe vertigo; nausea, vomiting; may have difficulty breathing
- 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

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

<table>
<thead>
<tr>
<th>Pt. name</th>
<th>DOB</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Witness name</th>
<th>Call back number:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Chief complaint</th>
</tr>
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<tbody>
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</tbody>
</table>

#### Severe headache or seizure at onset?  
Y  N

#### Head trauma at onset?  
Y  N

### EXAM – NEW ONSET - BE FAST - Complete ENTIRE Stroke Screen  ✓ IF ABNORMAL

#### B Balance/Coord – Unsteady, fall?  
- Finger to nose, rapid alternating movements, heel to shin; note ataxia; tilting to one side, vertigo  
- R  L

#### E Eyes:  
- Vision changes: blurred, diplopia, loss of visual field; photophobia  
- Eye position; ptosis. Horizontal gaze; gaze palsy or fixed deviation  
- R  L

#### F Face:  
- Smile, show teeth; close eyelids, wrinkle forehead  
- Note unilateral weakness/asymmetry:  
- R  L

#### A Motor – ARM (close eyes and; hold out both arms 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 aphasia  
- Dysarthria  
- Word substitution/retrieval deficits  
- □ Normal  
- □ Abnormal

#### T Time last known well  
- Normal pt baseline  
- □ ≤ 3.5 hrs  
- □ >3.5 hrs  
- Time:

### Other assessments

<table>
<thead>
<tr>
<th>Level of consciousness: AMS? GCS: E V M</th>
<th>Total GCS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation: Answers accurately: Name, age, month of year; location, situation</td>
<td>X (1-4)</td>
</tr>
<tr>
<td>Responds to commands: open/close eyes</td>
<td>Y  N</td>
</tr>
<tr>
<td>Gross hearing – Note new onset unilateral hearing deficit; sound sensitivity</td>
<td>R  L</td>
</tr>
<tr>
<td>Say “Ah”, palate rises, uvula midline; Stick out tongue: remains midline (note abnormalities)</td>
<td>R  L</td>
</tr>
<tr>
<td>Neglect: one sided extinction (visual, auditory, sensory)</td>
<td>R  L</td>
</tr>
<tr>
<td>Motor: Lift leg. Normal; Abnormal: drift to no effort against gravity</td>
<td>R  L</td>
</tr>
<tr>
<td>Sensory: Focal changes/deficits (face, arms, legs); paresthesias, numbness</td>
<td>R  L</td>
</tr>
<tr>
<td>ANS: Sweating only one side</td>
<td>R  L</td>
</tr>
<tr>
<td>Neck stiffness (cannot touch chin to chest; vomiting)</td>
<td></td>
</tr>
</tbody>
</table>

### 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 |
| □ 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 | □ apixaban/Eliquis | □ argatroban |
| □ dabigatran/Pradaxa | □ desirudin/Privask | □ edoxaban/Savaysa | □ enoxaparin/Lovenox |
| □ fondaparinux/Arixtra | □ LMW heparin | □ lepirudin/Refudan | □ rivaroxaban/Xarelto |

| Platelet inhibitors: | □ ASA | □ clopidogrel/Plavix | □ dipyridamole/Aggrenox |
| □ prasugrel/Effient | □ ticagrelor/Brilinta | □ ticlodipine/Ticlid |

### Destination options: Primary SC (Delnor, Copley & Mercy) Comprehensive SC (CDH & Edward)

| □ Nearest hospital: Patient unstable |
| □ Nearest SC (primary or comprehensive) or MSU | □ LKW<3.5 hrs with (+) BEFAST |

| □ Nearest SC (primary or comprehensive) | □ LKW >3.5 hrs with (+) BEFAST |

### Stroke alert called to (OLMC hospital)

| Mobile Stroke Unit (MSU): Operates 365 days a year, from 8am to 8pm | Time: |
| MSU Nurse # (630) 906-0967 | Transfer of care time: |

MSU steps to consider:
1. □ LKW <3.5hrs with acute S&S 3. □ Confirm Meeting location
2. □ Request MSU via dispatch
### SEIZURES

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

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

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

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

2. **If generalized tonic/clonic seizure activity:**
   Benzodiazepine administration takes precedence over bG determination in pts who are actively seizing
   - **MIDAZOLAM 2 mg** increments IVP/IO q. 30-60 sec (0.2 mg/kg IN) up to 10 mg IVP/IO/IN titrated to stop seizure
   - If IV/IO unable/IN contraindicated: IM 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose
   - All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated
   - If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants:
     - ↓ total dose to 0.1 mg/kg.
   - **If pregnant with possible eclampsia:** Rx with MAGNESIUM SULFATE per Eclampsia SOP (pg. 70)

3. **Identify and attempt to correct reversible precipitating causes** (see above)
   - Obtain and record **blood glucose** level per System procedure
   - If < 70: **DEXTROSE** or **GLUCAGON** per Hypoglycemia SOP (pg.34)
SEPSIS and SEPTIC SHOCK

1. IMC special considerations:
   - **INFECTION:** Rapidly assess for risk factors; S&S suggesting infection* and infectious source - IF YES
   - Use central sensor for SpO2 if pt has poor peripheral perfusion (cold hands)
   - **Assess ETCO2:** low levels (<31) suggest hyperventilation; poor perfusion to lungs; and/or metabolic acidosis. ETCO2 correlates to venous lactate levels. **If ETCO2 <31:**
   - **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 (normal 30-50) and **mean arterial pressure** (normal 70-110) q. 5 mins. 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 & 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 |

<table>
<thead>
<tr>
<th>*Indicators suggesting infection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever; warmth, swelling</td>
</tr>
<tr>
<td>Diarrhea</td>
</tr>
<tr>
<td>Fatigue, altered mental status</td>
</tr>
<tr>
<td>Dysuria, foul smelling/cloudy urine</td>
</tr>
<tr>
<td>Cough, dyspnea</td>
</tr>
<tr>
<td>Hyper/Hypoglycemia</td>
</tr>
<tr>
<td>Sore throat, ear ache</td>
</tr>
<tr>
<td>Redness/unhealed wounds</td>
</tr>
</tbody>
</table>

**If infection, no sepsis:** Cardio-resp. support and treat specific conditions per appropriate SOP or OLMC.

**SEPSIS:** Suspect infection + ETCO2 < 31 + ≥2 qSOFA criteria:  (SBP 90-100)

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 **ETCO2 ≤25** (lactate level ≥ 4 mmol/L)

2. Call OLMC with a **Sepsis alert** per local policy/procedure.
3. Improve perfusion: IV/IO **NS 200 mL boluses** in rapid succession (max: 30 mL/kg) to SBP ≥90 (MAP ≥65)
   - Reassess VS/skin signs/ETCO2 after each bolus. (Pts in septic shock may not respond to IVF)
4. If **hypotension persists after 500 mL IVF:** add inopressor while continuing IVF (2nd IV line needed)
   - **NOREPINEPHRINE** Initial dose: 8-12 mcg/min (2 mL/min), to reach SBP ≥ 90 (MAP ≥ 65).
   - Retake BP every 2 min until desired BP is reached (don’t overshoot), then every 5 min.
   - Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min)
   - **Keep fingers on pulse & watch SpO2 pleth on monitor for 5 min to detect PEA.** OR
   - **Push Dose EPI.**

**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; 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** – tissue hypoxia and acidosis begins BEFORE ↓ BP
### SHOCK Differential / Hypovolemic

**HYPOVOLEMIC SHOCK:** Associated with internal or external bleeding/volume loss (ATLS)

<table>
<thead>
<tr>
<th>S&amp;S progressive</th>
<th>Compensated</th>
<th>Uncompensated (Progressive)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood loss</strong></td>
<td>Up to 15% (750 mL)</td>
<td>15-30% (750-1500 mL)</td>
</tr>
<tr>
<td><strong>Mental status</strong></td>
<td>WNL-mild anxiety</td>
<td>Anxious, restless</td>
</tr>
<tr>
<td><strong>Skin</strong></td>
<td>Pale</td>
<td>Pale, diaphoretic</td>
</tr>
<tr>
<td><strong>HR</strong></td>
<td>WNL, slight increase</td>
<td>100-120</td>
</tr>
<tr>
<td><strong>RR</strong></td>
<td>WNL</td>
<td>20-30</td>
</tr>
<tr>
<td><strong>Pulse pressure</strong></td>
<td>WNL</td>
<td>≥100</td>
</tr>
<tr>
<td><strong>SBP</strong></td>
<td>WNL</td>
<td>≥100</td>
</tr>
</tbody>
</table>

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
   - Use central sensor for SpO₂ (if available) if pt has poor peripheral perfusion (cold hands)
   - Trend serial ETCO₂ readings (if available); low levels (<31) suggest hyperventilation; poor perfusion to lungs; and/or metabolic acidosis. Good correlation between ETCO₂ and venous lactate levels. See appendix.
   - Trend pulse pressures (normal 30-50) and mean arterial pressure (MAP = DBP + 1/3 PP) (normal 70-110) Pt who are older, hypertensive, or with head injury cannot tolerate hypotension for even a short time.
   - Vascular access & IVF per ITC SOP.
   - **Hypovolemic shock/active bleeding** (<3 hrs since onset of bleeding): TXA 1 Gm in 100mL NS IVPB over 10 min.

2. Assess and treat specific injuries per appropriate SOP.

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

See specific SOPs for: Anaphylactic shock  Cardiogenic shock  Neurogenic shock
**Obstructive shock:** Cardiac tamponade & Tension pneumothorax (Chest trauma); and massive Pulmonary Embolism (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.

**SCENE SIZE UP:** Situational awareness; dynamic risk assessment –Assess/intervene as needed:
- Scene safety: control and correct hazards/threats: form plan of approach; remove pt/responders from unsafe environment ASAP; attempt to preserve integrity of possible crime scene evidence
- Mechanism of injury (MOI): anticipate type/severity of injury; universal precautions; use appropriate PPE
- Number of pts; triage/request additional resources if needed. Weigh risk of waiting for resources against benefit of rapid transport to definitive care. Consider if medium or large scale MPI declaration is needed.
- Bring essential resources to pt: hemorrhage control; airway & O₂; spine splinting; vascular access/IVF; pain mgt

**PRIMARY ASSESSMENT**

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

**AIRWAY/SPINE:** Snoring, gurgling, stridor, silence. Consider possible spine injury

- Open/maintain using position, suction, appropriate adjuncts, & manual spine precautions prn
- Once airway controlled: Apply appropriate size c-collar + selective spine precautions if indicated
- Vomiting/seizure precautions as indicated

5. **BREATHING/gas exchange/adequacy of ventilations:** Assess/intervene as needed
   - Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing)
   - Air movement, symmetry of chest expansion; accessory muscle use; retractions; lung sounds if vent. distress
   - SpO₂ if possible hypoxia, cardiorespiratory or neurological compromise. Note before & after O₂ if able.
   - ETCO₂ number & waveform if possible ventilatory/perfusion/metabolic compromise

**Correct hypoxia/assure adequate ventilations:** Target SpO₂: 94%-98% (92% COPD) unless hyperoxia contraindicated

- O₂ 1-6 L/NC: Adequate rate/depth; minimal distress; SpO₂ 92%-94% (88%-92% COPD)
- O₂ 12-15 L/NRM: Adequate rate/depth; mod/severe distress; SpO₂ < 92%; (<88% COPD)
- O₂ 15 L/ BVM: Apnea and/or shallow/inadequate rate/depth with mod/severe distress; unstable

**ETCO₂**:
- CPAP: Per appropriate SOP - If tension or open pneumothorax/flail chest → Chest Trauma SOP

6. **CIRCULATION/perfusion:**

   Compare radial/carotid pulses for presence, general rate, quality, regularity, & equality; assess skin color, temp, moisture

   - No carotid pulse → **Traumatic Arrest SOP**

   - 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 wound w/ topical hemostatic gauze / apply direct pressure. Freq. ✓ 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 if possible): Catheter size & infusion rate per pt size, hemodynamic status; SOP or OLMC
  - If in shock: 14-16 g. WO up to 1 L based on SBP (MAP); radial pulse & coherent mental status.
  - Do not exceed BP targets. Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome.

- Penetrating trauma to torso: Target SBP 80 (MAP 50-60) (permissive hypotension)

- Blunt trauma: Target SBP 90 (MAP 60-65); 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

**Hypovolemic shock/active bleeding (<3 hours): TXA 1 Gm in 100mL NS IVPB over 10 min:**

- Monitor ECG if actual or potential cardiorespiratory compromise

7. **Disability:** Rapid neuro exam: GCS; pupils; ability to move all four extremities (S&S ↑ICP or herniation)

   If AMS: blood glucose per System procedure. If < 70: Treat per Hypoglycemia SOP.

8. **Pain mgt** if SBP ≥ 90 (MAP≥ 65): Rx per PAIN Mgt. SOP

   Nausea: ONDANSETRON standard dose per IMC

9. **Expose/environment:** Undress to assess as appropriate. Keep patient warm. CONTINUED
## TRANSPORT DECISION
- Consider need for trauma surgeon scene response per Region IX policy & local procedure; start early notifications
- Transport to nearest appropriate hospital per Region triage criteria 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 if able) – 1st BP manually; subsequent automated OK; trend pulse pressures; Pulse: rate, quality, rhythmicity
   Respirations: rate, pattern, depth
   Temp if indicated
   SAMPLE history: OPQRST of CC/pain using approx. pain scale consistent with the pt's age, condition, and ability to understand
   Allergies ( meds, environment, foods), Medications ( prescription/over-the-counter – bring containers to hospital if possible),
   PMH ( medic-alert jewelry; medical devices/implants; Last oral intake/LMP Events leading to injury
   2. Review of Systems: Deformities, contusions, abrasions, punctures/penetrations, burns, lacerations, swelling, tenderness, instability, crepitus, and distal pulses, motor/sensory deficits + the following based on chief complaint: S&S; scope of practice, and pt level of acuity
   - HEAD, FACE, EYES, EARS, NOSE, MOUTH: Drainage; pupils for size, shape, equality, and reactivity; conjugate eye movements; gaze palsies; visual acuity; eye level (symmetry), open & close jaw; malocclusion.
   - NECK: Carotid pulses, jugular veins, sub-q emphysema, c- spines; may temporarily remove anterior c-collar to assess neck
   - CHEST: Auscultate lung/heart sounds
   - ABDOMEN: S&S of injury/peritonitis by quadrant: contour, visible pulsations, pain referral sites, localized tenderness, guarding, rigidity; evidence of rebound tenderness
   - PELVIS/GU: Inspect perineum for blood at urinary meatus/rectum
   - EXTREMITIES: Inspect for position, false motion, skin color, and signs of injury
   - BACK/flank: Note any muscle spasms
   - Neuro: Affect, behavior, cognition, memory/orientation; select cranial nerves ( procedure); motor/sensory; ataxia
   - SKIN/SOFT TISSUE: Color (variation), moisture; temp, lesions/wounds; sub-q emphysema

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

4. Report pertinent positive/negative signs as able; any major changes from primary assessment

5. Document Revised Trauma Score parameters on ePCR/EHR

6. Handover Report: An EMS “time-out” to allow for an uninterrupted report at hospital is useful to ensure continuity of care especially if complete written/electronic ePCRs/EHRs are not available at time of pt handoff (ACS, 2014).

### Revised Trauma Score (RTS) Table

<table>
<thead>
<tr>
<th>Eye Opening</th>
<th>4</th>
<th>To voice</th>
<th>3</th>
<th>To pressure</th>
<th>2</th>
<th>None</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Response</td>
<td>Oriented &amp; converses</td>
<td>5</td>
<td>Confused speech</td>
<td>4</td>
<td>Inappropriate words</td>
<td>3</td>
<td>Incomprehensible sounds</td>
</tr>
<tr>
<td>Motor Response</td>
<td>Obeys commands</td>
<td>6</td>
<td>Localizes pain</td>
<td>5</td>
<td>Withdraws to pressure</td>
<td>4</td>
<td>Abnormal flexion</td>
</tr>
<tr>
<td></td>
<td>Abnormal extension</td>
<td>2</td>
<td>None</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| *GCS Conversion points | GCS 13-15 | 4 | GCS 9-12 | 3 | GCS 6-8 | 2 | GCS 4-5 | 1 | GCS 3 | 0 |

| Respiratory Rate | 10-29 | 4 | 30 or above | 3 | 6-9 | 2 | 1-5 | 1 | 0 | 0 |

| Systolic BP | 90 or above | 4 | 76-89 | 3 | 50-75 | 2 | 1-49 | 1 | 0 | 0 |

<table>
<thead>
<tr>
<th>RR score:</th>
<th>BP Score</th>
<th>Total RTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-29</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>30-40</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>40-59</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>60-79</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>80-99</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Trauma Triage / Transport Criteria (adult & peds)

Trauma pts should be taken directly to the TC most appropriately equipped and staffed to handle their injuries, as defined by the Region’s trauma system (below). EMS should bypass facilities not designated as appropriate destinations, even if those facilities are closest to the incident (ACS-COT, 2014). See appendix for listing of all TCs in Regions 8, 9, & 10. If local agency concerns oppose using these triage & transport criteria, EMS personnel should contact OLMC for orders.

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

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

<table>
<thead>
<tr>
<th>Step 1 Physiologic criteria</th>
<th>Time sensitive pt</th>
<th>Level I Trauma Center</th>
<th>Nearest Trauma Center Level I or II</th>
<th>Nearest hospital Trauma or non-trauma center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glasgow Coma Score</td>
<td>13 or less (w/ head trauma)</td>
<td>14 - 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Systolic BP</td>
<td>≤&lt; 90 (adults) / &lt;70 (peds)</td>
<td>≥90 (adults) / ≥70 (peds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>&lt; 10 or &gt; 29 (&lt;20 infant) or need for ventilatory support</td>
<td>10 – 29 ( ≥ 20 infant)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2: Anatomic Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head/neck trauma</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td>Spinal cord injury</td>
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<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td>Chest/back</td>
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<td></td>
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<tr>
<td>Abdomen/Groin/Pelvis</td>
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<tr>
<td>Extremities/Vascular</td>
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Step 3: NO physiologic or anatomic criteria above, but MOI below, transport to closest trauma center Level I or II

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

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

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

Motorcycle crash > 20 mph

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

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

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

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

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

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

EMS provider judgment (injury from large animal)

CARDIAC ARREST due to TRAUMA

**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:**
- Scene size up; ensure EMS and patient safety
- **Trauma with any VS prior to cardiac arrest:** start CPR per Cardiac Arrest SOP, transport immediately.
- Victims of submersion, lightning strike and hypothermia deserve special consideration as they may have an altered prognosis. See appropriate SOP.
- If resuscitation indicated: Complete interventions ENROUTE as time and number of EMS personnel permits:
  - Assess to find possible reversible cause(s) of arrest, e.g., hypoxia, hypovolemia, decreased cardiac output secondary to tension pneumothorax, pericardial tamponade, or hypothermia.
- Control visible hemorrhage per ITC SOP/System procedure
- If multi-system trauma or trauma to head and neck: Apply selective spine motion restriction
- Secure airway per Advanced Airway SOP:
- If decreased/absent lung sounds during PPV and difficulty ventilating pt: suspect pneumothorax, hemothorax, or ruptured diaphragm: **pleural decompress** affected side(s)
- **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; TXA per ITC

Cardiac arrest survival is unlikely if uncorrected severe hypovolemia exists.

Conducted electrical weapon: Post-TASER Care

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

If pt is decisional and refuses Rx and/or transport, advise to seek medical attention immediately if they experience any abnormal S or S.
If patient has not had tetanus immunization in the last 10 yrs, advise to acquire it
Provide disclosure of risk and execute Refusal per System procedure. Contact OLMC from point of patient contact.
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, constricting jewelry; belts, suspenders, steel toed shoes (retain heat)
   - Do not pull away clothing stuck to skin (cut around)
   - Keep burn as clean as possible; wear gloves/mask until burns covered

   **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 rate, depth and WOB and for dyspnea/stridor
   - Quantify oxygenation (SpO2), ventilation, perfusion, shock (ETCO2 if available)
   - Elevate HOB to decrease airway edema
   - **Assess need for advanced airway:** Access may be difficult w/ burns of face or anterior neck.
     Early DAI (largest ETT possible) may be indicated for pts with severe airway impairment/respiratory distress; secure w/ ties around head; don’t apply tape to facial burns

   **Circulation:** Pulse, capillary refill; ECG
   - **Indications for IV/IO - % TBSA:** Adults > 20%; Children >15%; shock; need for IV meds
     - May start through burned skin if needed; infuse warm fluid.
     - If not in shock: Initial NS IVF: ≤5 yrs: 125 mL/hr 6-13 yrs: 250 mL/hr ≥14 yrs: 500 mL/hr
     - If in shock: NS IVF/ Burn formula / OLMC. Document total IVF infused by EMS; report to receiving facility

   **Mental status:** If AMS consider hypoxia, shock, head trauma, toxic inhalation, alcohol/drug impairment, and hypoglycemia. Obtain/document glucose level – treat hypoglycemia per SOP.

   **Pain:** 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** using Rule of 9s or Rule of Palms (palm + fingers; use for small or scattered burns up to 10%). Accurate % may be difficult to determine; include only partial & full thickness in calculation for IVF as superficial burns do not contribute to fluid shifts & do not require IVF resuscitation.

   **Obese pts:** Trunk may be up to 50% of TBSA, each leg up to 20%. Head & arms smaller %

   **History:** Allergies: Sulfa?;  **Meds:** those w/ implications for wound healing: steroids
   - PMH co-morbid factors (preexisting illness, meds, Hx of drug/alcohol use)
   - **Events:** type of exposure; burning agent; time of exposure; duration of contact; temp of exposure; any LOC?; history of enclosed space fire; consider possible abuse

   **VS:** Assess on unburned skin if possible; edema may obscure pulse; use alternate sites; ID how quickly condition is changing

   **Assess for multi-system trauma:** treat associated injuries. **Circumferential burns to torso/limbs** dangerous due to potential vascular and ventilatory compromise (compartment syndrome); careful ongoing assessments. Transport per Trauma Triage Guidelines

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**Rule of Nines**

- 9% Trunk
- 18% Back
- 9% Head & hands
- 9% Lower legs
- 9% Upper arms
- 9% Lower arms
- 4.5% Groin
- 4.5% Axilla
- 4.5% Pubic area

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**Rule of Palms**

- 9% Trunk
- 18% Back
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- 9% Upper arms
- 9% Lower arms
- 4.5% Groin
- 4.5% Axilla
- 4.5% Pubic area

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**Rule of 3s**

- 3% Elbows
- 3% Knees
- 3% Forehead
- 3% Temporal areas
- 3% Eyelids
- 3% Nose
- 3% Nipple
- 3% Scrotum
- 3% Scalp
**THERMAL**

2. WOUND CARE per System protocol
   - COOL PT burns <10% or FT burns < 2% with water or NS for 10 min; do not apply ice
   - Minimize contamination: Cover burns with plastic wrap to ↓ air movement over burn; ↓ pain; reduce fluid loss; & prevent hypothermia and prevent contamination; apply dry sterile dressings or other agents per System policy. Smaller burns < 5% or eyelids may have moist dressings.
   - Do not break blisters, debride skin, or apply topical ointments, creams, or anti-microbials in the field
   - Wrap digits individually or place gauze between burned skin areas

3. Prone to hypothermia: **Keep warm** - Anticipate shivering and temp loss in burns > 20% TBSA. Open burn sheet on stretcher before placing pt. Cover pt with clean dry sheet and blanket; place in warm environment ASAP

**INHALATION**

2. Assess for stridor, wheezing, carbonaceous (black) sputum, cough, hoarseness, singed nasal or facial hair, dyspnea, burns, edema or inflammatory changes in oral pharynx/upper airway

3. Assess need for advanced airway per local policy/procedure; 02 15 L/NRM or BVM; monitor ECG

4. Consider presence of CO and/or cyanide poisoning and treat per appropriate SOP (SpO2 unreliable)

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

2. Ensure scene safety: do not contact pt until certain electrical source has been disabled/disconnected

3. Assess cardiorespiratory status. If unresponsive, apneic and pulseless: Begin CPR and resuscitation per SOP
   - Monitor ECG (12 L if available); treat dysrhythmias and/or tonic clonic seizures per appropriate SOP
   - Anticipate respiratory arrest/paralysis of respiratory muscles if pulse is present; assist ventilations prn
   - IVF: 2-4 mL kg X %TBSA burned = ½ in 1st 8 hrs

4. Attempt to locate all contact points (entry and exit wounds). Describe appearance of wounds (often full thickness); No cooling needed unless an associated thermal burn; Apply dry, sterile dressings.

5. Assess for potential associated trauma from being thrown from contact point; note neurovascular function all limbs. Assess for potential compartment syndrome; selective spine motion restriction per SCI SOP

6. Event Hx: Identify nature of the electrical source (AC vs DC), voltage, amperage and duration of exposure if known; position of pt. in relation to electrical source; downtime in cardiac arrest

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

2. Avoid self-injury; haz-mat precautions; decon per procedure; remove contaminated clothing.

3. Flush/irrigate burn/eyes ASAP per procedure with the cleanest, readily available water or NS unless contraindicated (sulfuric acid, sodium metals, dry chemicals -especially alkalines) using copious amounts of fluid.
   - If powdered/dry agent, brush away excess before irrigating.

4. Hydrofluoric acid skin burn: Apply CALCIUM GLUCONATE 2.5% gel to the burn site (if available). Monitor ECG.

5. Bring in SDS (Safety data sheets) if possible; early notice to receiving hospital if decontamination is needed

**BURN CENTER REFERRAL CRITERIA (Adult & Peds)**

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


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

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

**TENSION PNEUMOTHORAX**

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

2. **Needle pleural decompression** on affected side per System procedure while on scene (takes priority over airway). Frequently reassess catheter patency. May need to repeat procedure with additional needle.

3. Continue ITC enroute; implement other protocols as required.

4. Monitor for PEA: Treat per SOP.

**OPEN PNEUMOTHORAX** (Sucking chest wound)

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

**FLAIL CHEST (+/- paradoxical chest movement; anticipate pulmonary contusion – SpO₂ < 90%)**

2. If ventilatory distress; adequate ventilatory effort; no S&S pneumothorax: consider **early trial of C-PAP**
   - PEEP 5-10 cm to achieve SpO₂ of at least 94%
   - If SBP falls < 90: titrate PEEP downward to 5 cm; D/C CPAP if hypotension persists
   - 3. If ventilatory failure or persistent hypoxia despite above: intubate (DAI) & ventilate w/ 15L O₂/BVM at 10 BPM
   - 4. Monitor for tension pneumothorax; prepare to perform needle pleural decompression
   - 5. Assess need for pain management per ITC; titrate carefully to preserve ventilations/BP

   **Note:** If patient suffers a cardiac arrest: an impedance threshold device is contraindicated.

**PERICARDIAL TAMPOONADE**

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

2. Permissive hypotension **NS IV WO** while enroute just to achieve **SBP 80.** 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 may include cardiac wall rupture, cardiac contusion, septal and valvular injury, injury to thoracic aorta, AMI/dysfunction; & lethal dysrhythmias.

**Aorta:** May have no external S&S of trauma. 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 deficit

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

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

General approach:
1. ITC special considerations:
   - Quickly obtain gross visual acuity in each eye: light perception/motion/read name badge
   - Assess pain on scale of 0-10
   - Assess cornea, conjunctiva, sclera for injury, tearing, foreign body, spasm of lids
   - Discourage patient from sneezing, coughing, straining, or bending at waist; vomiting precautions (ondansetron)
   - Remove and secure contact lenses for transport with patient
2. Pain unrelieved by Tetracaine or Tetracaine contraindicated. See PAIN Mgt SOP (pg. 5)

CHEMICAL SPLASH / BURN: TRUE EMERGENCY

Chemicals may be acid, alkali, irritant, detergent, or radioactive in nature and may take 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 copious amounts (≥ 500 mL) of NS or any other non-toxic liquid immediately available. Do not contaminate uninjured eye during irrigation. Continue irrigation enroute to the hospital.

CORNEAL ABRASIONS: Observe for profuse tearing, severe pain, redness, spasm of eye lid
3. No signs of penetrating injury: TETRACAINE 0.5% 1 gtt. each affected eye. Repeat prn.
4. Elevate head of stretcher 45°.

 PENETRATING INJURY/RUPTURED GLOBE
S&S: Peaked pupil, excessive edema of conjunctiva (chemosis), subconjunctival hemorrhage, blood in anterior chamber (hyphema), defect on sclera or cornea (vitreous humor or black defect), foreign body/impaled object
3. DO NOT remove impaled objects, irrigate eye, instill tetracaine, or apply any pressure to eye.
4. Cover with protective shield or paper cup; do not patch eye directly or pad under metal shield.
5. Elevate head of stretcher 45°.

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

1. ITC special considerations:
   - Assess need for SMR; PMH for blood thinners; control exterior bleeding.
   - Clear oral cavity of F/B and gross debris. Allow pt to assume position that allows for patent airway (sitting or side lying so blood/secretions drain from nose & mouth); avoid aspiration/swallowing blood; suction prn; no nasal airways; O₂ to SpO₂ ≥ 94% unless contraindicated
   - Control epistaxis (squeeze nostrils 10-15 min); do not pack nose if rhinorrhea. Collect blood on rolled 4X4 under nose. Do not let patient blow their nose.
   - Assess for stable midface, mandible, dentition; tissue/dental avulsions: collect/preserve tissue/Musculoskeletal SOP
   - Vomiting/aspiration precautions: ONDANSETRON standard dose
   - IV access for IVF, pain meds, or ondansetron (more likely)
   - Apply cold packs over injury site; severe pain: FENTANYL or KETAMINE standard dose 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. Unrecovered teeth may be aspirated. If GCS 15, may hold tooth in mouth for transport.
3. Mandible fx: Cannot open/close jaw, spit/swallow effectively; malocclusion/sublingual hematoma: no chin lift; aspiration risk
4. Maxillary fx (LeFort): Anticipate nasal bone/anterior basilar skull fx
**HEAD TRAUMA / Traumatic Brain Injury (TBI)**

Level I TC: GCS: 13 or less associated w/ head trauma; penetrating head or neck trauma; open or depressed skull fx

Nearest TC: GCS 14-15; blunt head injury; hemodynamically stable

1. **ITC special considerations:**
   - SMR if indicated
   - **Mod to severe injury:** Continuous SpO2 and ETCO2 monitoring; prevent/correct hypoxia and hypoventilation ASAP
   - **DO NOT OVERVENTILATE:** Assist/ventilate at 10 BPM prn; maintain ETCO2 at 35-40 (if available)
   - Consider need for advanced airway if unable to oxygenate, ventilate, or protect airway. Must monitor with ETCO2
   - Vomiting precautions. **ONDANSETRON** prn; limit suction to 10 sec; oxygenate before & after procedure
   - **Scalp wounds:** No unstable fracture: direct pressure, dressings
   - Unstable/open fx: hemostatic dressings, avoid direct pressure
   - **12-lead ECG** if dysrhythmia present: PACs, SB, SVT, PVCs, VT, Torsades, & VF
   - **SAH. Pathological Q waves, ST elevation or depression; prolonged QTc, wide, large & deeply inverted (neurogenic or cerebral) T waves; prominent U waves > 1 mm amplitude common causing incorrect suspicion of myocardial ischemia.**
   - Attempt to maintain cerebral perfusion pressure (CPP): **Avoid/correct all hypotension ASAP**
   - If GCS s8: Keep head of bed flat; **NO permissive hypotension** in multi-system trauma w/ TBI
   - **NS IVF boluses** (200 mL increments up to 1 L); target SBP 110-120 (MAP 85-90) or higher
   - If generalized tonic clonic seizure activity present: **MIDAZOLAM** standard dose for seizures
   - **AMS:** Blood glucose level per local procedure (capillary and/or venous sample)
   - If < 70: treat per Hypoglycemia SOP (adult pg. 34 & peds pg. 88)

2. **Neuro exam - Establish patient reliability**
   - Patient must appear calm, cooperative, alert, and perform cognitive functions appropriately with NO AMS, acute stress reaction, brain injury, chemical impairment causing altered decisional capacity, distracting painful injuries, and language or communication barriers.
   - Rapid neuro exam for evidence suggesting traumatic brain injury
   - **Reassess at least q. 15 minutes; more frequently as able:**
     - Mental status [arousal, orientation, memory (amnesia), affect, behavior, cognition]; GCS
     - Early S&D deterioration: confusion, agitation, drowsiness, vomiting, severe headache
     - Pupil size, shape, equality, reactivity; gaze palsy; visual changes/disturbances; light sensitivity, hearing deficits
     - BP (MAP), pulse pressure; HR; respiratory rate/pattern/depth; SpO2, ETCO2 if available
     - Pain (headache), dizziness, motor/sensory integrity/deficits; coordination & balance

3. If nonresponsive to verbal efforts to calm them or uncooperative in remaining still:
   - Restrain as necessary per system policy. Document reasons for use.
   - **Sedation:** If SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM** standard dose for anxiety.

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

**ITC special considerations:**
   - Maintain supine position with head in axial alignment
   - Assess SpO2; ETCO2 (if available): O2 12-15 L/NRM or BVM at 10 BPM
   - **Assess for signs of brain shift:** Coma; dilated, nonreactive pupil(s); motor deficit; GCS drops by 2 or more points (<8) If present: Seek OLMC order for **limited hyperventilation:** Adult: 17-20 BPM (must be guided by ETCO2 30-35)
   - NO atropine if bradycardic and SBP ≥ 90 (MAP≥ 65)
**BASILAR SKULL FRACTURE** [CRITICAL]

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

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

**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.

**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

**(Abbreviated) SPORT CONCUSSION ASSESSMENT TOOL 5TH EDITION (Scat 5)**

- Assess GCS; assess orientation: month, date, year, day of the week; time within one hour
- Carefully assess decisional capacity (Behavioral Emergencies).
- Abnormal behavior (change in personality)
- **Cognitive impairment:** Disorientation/confusion, drowsiness, inability to answer questions appropriately, amnesia; lack of awareness of what happened, difficulty remembering people/places; blank or vacant look; feeling like in a fog; difficulty concentrating or
- **Balance**/gait difficulties (unsteadiness), motor incoordination/stumbling; slow, labored movements.
- Assess Balance/Cerebellar function using Stroke Screen
- Sensitivity to light or noise?
- Blurred vision?
- Assess for possible SCI. Neck pain? Should have full range of pain free passive cervical spine movement

**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 headache; pressure in head
- Seizures; loss of consciousness
- Increasingly restless agitated or combative
- Vomiting
### MUSCULO-SKELETAL Trauma

1. **ITC** special considerations:
   - Assess pain, paralysis/paresis, paresthesias, pulses, pressure & pallor before & after splinting. Assess for deformity, shortening, rotation, or instability.
   - **Analgesia before moving/splinting**: Hemodynamically stable, isolated MS trauma, no contraindications (drug allergy, AMS):
     - Rx per Pain Mgt. SOP (pg. 5)
     - Severe muscle spasm: Analgesia as above and/or: MIDAZOLAM (anxiety dosing)
   - Meets TC I or II criteria: On scene care restricted to hemorrhage control, airway access, selective spine precautions if needed, & O2 delivery. Attempt all other interventions enroute.
2. Gently attempt to align long-bone fx unless open; resistance to movement; extreme pain, or involves a joint
3. **Immobilize/splint** per procedure; If pulses lost after applying traction splint: Do not release traction. Notify OLMC.
4. Acute injury: Apply **cold pack** over injury site and **elevate** extremity after splinting unless contraindicated.

#### AMPUTATION / DEGLOVING INJURIES:

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

5. **Amputation incomplete or uncontrolled bleeding**: Hemorrhage control per ITC; splint as necessary.
6. **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 (CRITICAL)

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

5. **ITC** special considerations:
   - Baseline ECG before release (if possible); continue ECG monitoring after release
   - IV NS TKO prior to release; WO after release; 200 mL IVF challenges in elderly (monitor for fluid overload)
   - **Assess for HYPERKALEMIA w/ cardiotoxicity**: Peaked narrow T waves w/ shortened QT to flattened or absent P waves, prolonged PRI, wide QRS, sine-wave pattern (QRS merges w/ T wave), asystole. If present:
     - SODIUM BICARBONATE 50 mEq slow IVP over 5 min followed by 20 mL NS IV flush
     - No IV: ALBUTEROL 5 mg continuous neb up to 20 mg (throughout transport) [BLS]
     - OLMC may order both to be used

6. 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 min following release unless contraindicated. (Ensure clear lung sounds, no SOB)
7. Assess for **COMPARTMENT syndrome**: If present do not elevate or cool limb.

#### IMPALED OBJECTS (EMERGENT to CRITICAL depending on location):

5. Never remove an impalement unless through cheek and poses an airway or ventilatory impairment, or would interfere with chest compressions or transport.
6. Stabilize object with bulky dressings; insert small (dentil size) gauze roll into mouth to absorb excess blood.
7. 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 result in loss of 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.

5. Prior to rescue: **Lift legs into a sitting position** if possible.
6. **ITC** special considerations:
   - Baseline ECG before release (if possible); continue ECG monitoring after release
   - IV NS TKO prior to release (if possible). Run wide open after release up to 1 L.
7. 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.
8. Treat **dysrhythmias** per SOP. If **significant HYPERKALEMIA** suspected: Rx per Crush Syndrome.
SPINE TRAUMA: Adult & peds


1. ITC special considerations: Assess in position found.
   - Frequently reassess airway/ventilations (ETCO₂), ability to talk; muscles used to breathe
   - Prepare for advanced airway or ventilatory support if RR/depth diminishes & ventilatory failure imminent/present
   - Monitor for airway/ventilatory compromise or aspiration in immobilized pts w/ N / V or with facial/oral bleeding
   - Suction precautions at all times
   - **Assess for shock** (neurogenic – next page): Treat hypotension: IVF per ITC; target adult MAP 85-90
   - Prevent hypothermia: SNS disrupted w/ injury above T6; may have altered thermoregulation (poikilothermia)
   - **Nausea/vomiting:** ONDANSETRON standard dose per IMC
   - **Pain:** Reduce standard dose by ½ - judicious use of opiates. Avoid resp. depression; preserve neuro function

2. Assess patient/scene/MOI to determine risk of injury: MOI alone does not determine need for SMR

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 spine injury
   - **Pain** or pressure in neck, head, or back (pt complaint); spine pain/tenderness/deforinity to palpation
   - **Paralysis/paresis**/abnormal motor exam (shrug shoulders; flexion/extension elbows, wrists; finger abduction/adduction; foot plantar flexion; foot/great toe dorsiflexion)
   - **Paresthesia** (back of head; extremities): tingling, numbness, burning, electric shock at or below level of injury
   - Abnormal Per{ception/response to touch/pain stimulus (sharp/dull or deep pressure) (thorax, arms or legs)
   - Head trauma with AMS; Priapism; Proprioception (position sense) deficit
   - Absence of sweating below injury; spinal shock; neurogenic shock; abnormal breathing (diaphragm only)
   - Abnormal Position: Head tilt and/or "Hold-up" position of arms

5. Spine motion restriction indications following blunt trauma (also see Elderly SOP pg. 9)
   - Acutely altered level of consciousness (e.g., GCS <15, evidence of intoxication) w/ MOI
   - Midline neck or back pain and/or tenderness
   - Focal neurologic signs and/or symptoms (e.g., numbness or motor weakness)
   - Anatomic deformity of the spine
   - Distracting circumstances or injury (e.g., long bone 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: Unstable spinal column injuries can progress to severe neurological injuries in the presence of excessive movement of the injured spine. SMR, when indicated, should apply to the entire spine due to the risk of noncontiguous injuries.
   - Manually stabilize head & neck. Unless necessary to maintain an open airway/other compelling reasons, keep neck/back in original position (of a deformity) until exam is done. NEVER apply TRACTION to the NECK.
   - **If exam is normal:** have pt move to axial alignment. Stop if pain or resistance
   - Apply an appropriately sized c-collar (unless contraindicated). **PLUS:**
   - Extricate patient per System procedure
     - **Stable pt/scenes; in vehicle and no injury:** adult / child in booster seat may self- extricate onto stretcher. Extricate smaller child while strapped in car seat.
     - **Stable pts/scene; in vehicle with injury:** KED (vest-type device) or short board to remove
     - **Unstable location or pt; in vehicle:** Rapid extrication (lift & slide onto long board); move to cot for evaluation
     - **SMR cannot be properly performed with a c-collar only or a patient in a sitting position.**
       - Stabilize remainder of spine by keeping head, neck, and torso in alignment. Secure to a stable reference point. Options: scoop stretcher, long backboard, vacuum mattress, or ambulance cot per procedure
       - If head elevation required, elevate splinting device at the head while maintaining alignment of neck and torso.
       - Use blocks, blanket roll, or head immobilizer so flexion, extension, and/or rotation of head/neck is minimized.
Methods of providing SMR continued:

- Fill voids as necessary. Secure device & patient to ambulance cot with appropriate straps; protect paralyzed limbs.
- **Children** are abdominal breathers, place straps over chest/pelvis, not across abdomen. Heads are disproportionately large. Board should have recess for head or elevate shoulders/torso 1-2 cm to avoid neck flexion when immobilized.
- All **patient transfers** create potential for unwanted displacement of an unstable spine injury. Focus particular attention to pt transfers from one surface to another. Use a scoop stretcher, long spine board, or a vacuum mattress to assist with transfers 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 assures pt remains securely positioned on cot with a c-collar 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 AMS, nonresponsive to verbal commands, or uncooperative in remaining still: **Assess need for sedation**
   - If no loss of consciousness or respiratory depression; SBP ≥ 90 (MAP ≥ 65): **MIDAZOLAM** (anxiety dosing)
   - If AMS: Adult: dose for age: Adult: 3 mg IVP / Peds 2 mg

**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.

**Fullface 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]:** Distributive (vasodilatory) shock due to loss of sympathetic tone seen in high level paraplegia (T1-T4) or tetraplegia resulting in SBP < 90 (vasodilation); HR < 60 (unopposed Vagal tone); skin warm/dry below injury; ETCO₂ may be <=31. Consider other causes of hypotension in acute trauma: hemorrhage, tension pneumothorax, myocardial injury, pericardial tamponade.

- **NS IVF challenges** in consecutive 200 mL increments up to 1 L to achieve/maintain SBP ≥ 90 (MAP ≥ 65) Repeat BP assessments after each 200 mL and reassess lung sounds. Avoid fluid overload.
- ↓ HR & BP persist: **ATROPINE 0.5 mg rapid IVP (Peds):** 0.02 mg/kg IV/IO minimum 0.1 mg; max adult dose) May repeat q. 3 minutes to a max dose for age: Adult: 3 mg IVP / Peds 2 mg.
- ↓ BP persists: **NOREPINEPHRINE 8 mcg/min (2 mL/min) IVPB to reach SBP ≥ 90 (MAP ≥ 65). Retake BP every 2 min from time drug is started until desired BP reached (don’t overshoot), then every 5 min. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR PUSH DOSE EPI OR DOPAMINE in alpha doses.**
# 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.

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

1. **Scene size up:** Determine if additional help is needed
   - **EMS Responder #1:** Notify dispatch. Call for an officer; describe incident: nature, location, presence of debris, hazards, traffic, entrapments, estimated # patients, ask dispatch to alert Resource Hospital if possible med-lg scale incident; help with triage/treatment when initial communication is complete.
   - **EMS Responder #2:** Begin triaging all patients using Start/JUMPstart

2. First arriving EMS personnel/office/acting officer becomes initial IC and establishes scene command. Determines scale of incident (small, medium-large), builds resources, makes assignments; deploys ID vests if escalates/mutual aid involved to ID key personnel.

**Medical group appointed:** informs IC re needed resources (additional amb., helicopter, personnel, equipment)

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

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

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

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

Red - Priority 1
- Respiration >30
- Resp resume after head tilt
- Delayed capillary refill (> 2 sec)
- Pulse: radial absent/carotid present
- AMS: cannot follow commands
- Uncontrolled bleeding

Yellow - Priority 2
Non-ambulatory; all others:
RR <30; + radial pulse; can follow commands

Green - Priority 3
Can walk; Direct to a specific location

Deceased - Priority 0
No respirations after opening airway

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

JUMP START

Red - Priority 1
- Respiration <15 or >45
- Apneic & breathes after opening airway
- Breathes after 5 rescue breaths
- No pulse w/ RR 15-45
- Unresponsive / Inap. pain response
- Uncontrolled bleeding

Yellow - Priority 2
Can’t walk; RR 15-45; + pulse; “A”, “V” or appropriate “P” pain response

Green - Priority 3
- Can walk
- Infants may appear to have no major injuries
- Direct to a specific location for secondary triage

Deceased - Priority 0
- No breathing after airway opened and 5 rescue breaths given
- No respiration & no palpable pulse

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

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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.atstd.cdc.gov/MHM/mm170.html](http://www.atstd.cdc.gov/MHM/mm170.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 action/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, lacrimation, urination, defecation, gastrointestinal distress, emesis, breathing difficulty with bronchospasm and copious secretions, arrhythmias, miosis (pinpoint pupils) resulting in blurred vision, headache, unexplained runny nose, chest tightness, jerking, twitching, staggering, seizures, coma, apnea, death

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


- **PPE:** All those entering a hot zone or working a decon station must wear full protection: body & respiratory
- **Suction,** O2: 15 L/NRM; support ventilations with BVM prn. As soon as adequate equipment and personnel allow: monitor quantitative waveform capnography (if available), SpO2 & 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
  - **DuoDote:** Do NOT remove Gray safety release until ready to use. NEVER touch green tip (needle end)
  - **Indications:** S&S of nerve agent or organophosphate exposure or when treating victims of a severe exposure in the hot zone. May be given by any EMS personnel with appropriate training. May be self-administered.
  - **Contraindications:** Do not use Auto-Injectors for prophylaxis or on children < 88 lbs (40 kg)
  - When a nerve agent has been ingested, exposure may continue for some time due to slow absorption from the lower bowel and fatal relapses have been reported after initial improvement. Continue monitoring and transport.
  - **If dermal exposure:** Decontamination is critical using standard decon procedures. Avoid cross-contamination.
  - **Contact Resource Hospital to alert them of incident and to request Chem Pac supplies.** RH alert receiving hospitals

#### Hot zone - severe exposures

**Adult/Children ≥ 88 lbs (40 kg)\(^1\)**
- **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.

<table>
<thead>
<tr>
<th>Rx in WARM zone: based on patient size &amp; severity of S&amp;S (IDPH protocol)</th>
<th><strong>Severe symptoms</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient age/size</strong></td>
<td><strong>Coma, paralysis, cyanosis, apnea, seizures</strong>***</td>
</tr>
</tbody>
</table>
| **Mild:** Unexplained runny nose, tightness in chest, SOB, bronchospasm w/ wheezing | **Infant (< 7 kg)**
- Atropine dose
  - 0.25 mg IM
- 2 PAM dose
  - 15 mg/kg IM
| **Mod:** Above + vomiting/diarrhea, pinpoint pupils, drooling, excessive sweating, abd cramps, invol urination or defecation, HA, muscle fasciculations/twitching, staggering | **Infant (7-13 kg)**
- Atropine dose
  - 0.5 mg IM&
- 2 PAM dose
  - 15 mg/kg IM |
| **Child (14-25 kg)** | **2 PAM dose**
- Atropine dose
  - 1 mg IM
- 2 PAM dose
  - 300 mg IM |
| **Child (26-40 kg)** | **2 PAM dose**
- Atropine dose
  - 2 mg IM
- 2 PAM dose
  - 600 mg IM |
| **Adult/Child ≥ 88 lbs (40 kg)** | **2 PAM dose**
- Atropine dose
  - 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** | **Severe symptoms**
**2-PAM: 1800 mg IM** |
| **Elderly/frail** | **Atropine 1 mg IM + *2 PAM 10 mg IM** |
| **Atropine 2-4 mg IM +*2 PAM 25 mg IM** |

**Notes on drug use**

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

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\(^1\) Region IX Final Mark-up edition 4-22-19
CHEMPACK REQUESTS

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.
- The availability of additional chemical nerve agent antidotes throughout Region IX will expedite delivery of life-saving treatments to individuals that require them in the event of such an emergency.
- 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**: the 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 the 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.

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.
   - **Instructions for disposal of any unused materials shall be obtained from the IDPH MCM Program Manager.**
     Carla Little; State MCM SNS/CRI Programs Manager
     IDPH/OPR; 217-836-9367
     The EMS Provider Agency will dispose of the unused CHEMPACK materials, as directed by IDPH.
   - The EMS Provider individual who signed for the 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

*Taken from the IDPH CHEMPACK Plan
ACTIVE ASSAILANT RESPONSE

Purpose: Describe the roles and responsibilities of EMS when working with law enforcement at or near a mass violence incident. Law enforcement is always the lead agency on these incidents; EMS shall follow PD 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 - Protective vest, helmet, and eyewear that are made to protect the wearer from ballistic threats such as gunfire, shrapnel, or sharp objects meant to do bodily harm.

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

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

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

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

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

Soft lockdown – Procedure specific to schools 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).
GUIDELINES

1. **Response and staging**: Responding EMS teams shall stage at safe locations out of the line-of-sight and away from the scene. Non-transport vehicles (not being used as RTFs) should block roads leading to the scene when PD or Public Works (PW) vehicles are not available. Drivers 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. **School Access**: Determine if on Hard or Soft Lockdown. Access to classrooms only possible with a key or through an exterior window. PD has access to interior door keys located in a key box on the building. 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 parents to that location.

5. **Explosive Devices**: Consider possible presence of explosive devices. If responding to a report of an explosive, 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.

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

7. **Incident Command**: Should establish the following: EMS Group, Rescue Group
   - Attempt to obtain accurate 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) Reference MABAS document**
   - Don BPE/PPE in a safe area, prior to making entry into warm zone. Should be equipped with Active Assailant “Sling” packs with appropriate trauma supplies, webbing, and evacuation litters.
   - PD escort may need to engage a threat, leaving them unprotected. RTFs should take cover behind protective barriers, e.g., brick walls, vehicles (or at least use concealment if suitable protective barriers unavailable
   - Once inside Warm Zone: RTFs move in a coordinated manner as directed by PD. Once pt(s) identified, advise IC of # and location; stop bleeding if possible; cover chest wounds with vented dressing, open airways manually and continue in search of more casualties until no more pts are found in Warm Zone. Then begin pt extraction. If resources allow, one RTF may begin pt movement to PCT while initial RTF is still making pt contacts.
   - PD providing protection for RTFs will determine safest path of travel for entry and exit (through a window).
   - When RTFs are leaving Warm Zone, PD members of RTF will protect group as effectively as possible.

10. **Transport of injured Police Officer and/or canines**: 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 officer’s weapon by transferring custody to an on-scene PD officer. If unable, EMS shall secure weapon(s) in ambulance gun safe.

11. **Tactical EMS (TEMS) personnel** operate under specific local policies/procedures that may be appended to these SOPs/SMOs.
WIDESPREAD DISEASE OUTBREAK

BIOLOGICAL agents

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

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

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

- 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
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

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

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

1. Assure scene safety. If offender is present; weapons are involved; the offender is under the influence of drugs and/or alcohol; and/or there are children present: call for police backup.

2. IMC special considerations:
   - Provide psychological support
   - Discourage patients from changing clothes, urinating, or washing away signs of the abuse
   - Treat obvious injuries per appropriate SOP
   - Cooperate with police to use all reasonable means to prevent further abuse or neglect

3. Illinois law requires EMS personnel to give suspected abuse victims information on services available to them
   - Inform them that they do not have to tolerate any abusive behavior.
   - Inform them that they and members of their family have the right to be protected from abuse and to press criminal charges against offenders.
   - Assure pt that the violence was not their fault and encourage them to seek medical attention.
   - See System-specific Domestic/Interpersonal Violence policies.

4. Report your suspicions to the receiving hospital. Clearly document all scene factors, physical signs and symptoms, and statements made by patient/bystanders that support your suspicions of abuse/violence.

5. If patient is < 18 years old; see Suspected Child Abuse or Neglect SOP.

   National Domestic Violence Hotline at 1-800-799-7233
   National Sexual Assault Hotline at 1-800-656-HOPE (4673)

If patient is 60 years or older:

Elder Abuse/Neglect Hot Line Number:
EMS personnel are mandatory reporters of suspected elder abuse. Call the following:

   IDPH ABUSE HOTLINE: 1-800-252-4343
   Department of Aging: 866-800-1409
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. Advanced airway per SOP: Gentle technique; may need one size smaller ET tube; normal size i-gel.
   - O₂ 12-15 L / tight fitting mask until SpO₂ ≥ 96%; SpO₂ 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.: – Fentanyl:** Category C – Consult with OLMC. The potential benefits to mother must be balanced 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. **TXA 1 Gm in 100mL NS IVBP over 10 min if within 3 hours of trauma**
   - **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.
   - Prepare to deliver if signs of imminent birth are present.

### Table: Changes in pregnancy

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal</th>
<th>Changes in pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood volume</td>
<td>5 L</td>
<td>Increased 40-50%; May NOT show S&amp;S of shock until ≥30% blood loss</td>
</tr>
<tr>
<td>HR</td>
<td>70</td>
<td>Increased 10-15 BPM higher than prepregnant state</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>110-120/70</td>
<td>Decreased 10-15 mmHg in 2nd trimester; returns to normal 3rd trimester Beware supine hypotensive syndrome &gt; 20 wks Vena caval &amp; aortic compression when supine ↓ RV preload &amp; CO by 30-40%</td>
</tr>
<tr>
<td>Cardiac output</td>
<td>5 L/min</td>
<td>Increased 20-30%</td>
</tr>
<tr>
<td>Hematocrit/hemoglobin</td>
<td>13-15 / 40</td>
<td>Decreased due to plasma dilution (physiologic anemia)</td>
</tr>
<tr>
<td>ETCO₂</td>
<td>35-45</td>
<td>25-32 &gt;10 wks gestation: Hyperventilation normal (gradient for gas exchange w/ fetus)</td>
</tr>
<tr>
<td>Gastric motility</td>
<td>Normal</td>
<td>Decreased; prone to vomiting &amp; aspiration. Last meal unreliable indicator of gastric contents. Decreased motility mimics silent abdomen.</td>
</tr>
</tbody>
</table>

- Pregnancy influences patterns of injury/clinical presentations after trauma. Highest risk in moms 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 suprapubric area. Appendix in RUQ in late pregnancy due to upward shifting of abdominal organs.
**PHASE I: LABOR**

1. Obtain history and determine if there is adequate time to transport to hospital with OB services
   - Gravida (# of pregnancies); para (# of live births)
   - Number of miscarriages, stillbirths, abortions or multiple births
   - Gestational age in weeks: Due date (EDC) or last menstrual period (LMP)
   - Onset, strength, duration & frequency of contractions (time from beginning of one to the beginning of the next)
   - Length of previous labors in hours
   - Status of membranes ("bag of waters") - intact or ruptured
     - If ruptured, inspect for prolapsed cord & evidence of meconium. Note time since rupture.
   - Presence of vaginal bleeding/discharge ("bloody show")
   - High-risk concerns: Lack of prenatal care, drug abuse, teenage pregnancy, mom 35 yrs & older; history of diabetes, HTN, CV and other pre-existing diseases that may compromise mother and/or fetus, pre-term labor (< 37 wks), previous breech or C-section, or multiple fetuses.

2. IMC special considerations:
   - Maintain eye contact; coach her to pant or blow during contractions.
   - If mother becomes hypotensive or lightheaded: turn pt. on side; O2 12-15 L/NRM; NS IVF challenges in 200 mL increments, if indicated.

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, each leg, & beneath perineum. Prepare bulb syringe, cord clamps, scalpel, and chux to dry and warm infant. Ready neonatal BVM, NRM, resuscitation equipment, and O2 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 (mucal 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

1. Assess newborn's ABCs. If distressed: → Newborn Resuscitation SOP (pg. 69)
2. Care immediately after delivery:
   - Keep infant level with uterus or place on mom's abdomen in a 15° head-down position (unless preterm, then keep horizontal) until cord stops pulsating
   - Suction mouth, then nose using bulb syringe; repeat as necessary
   - Ventilations should begin in 30 sec. Gently rub back or flick soles of feet. If no ventilations → Newborn resuscitation
   - Dry and warm infant, wrap in blanket or chux. Cover head with stockinette cap.
3. When cord pulsations stop: Clamp cord at 6” and 8” from infant's body; cut between clamps with sterile scalpel
   - If no sterile implement available, clamp cord but do not cut; safely secure infant for transport
   - Check cord ends for bleeding
4. Obtain 1 minute APGAR score. If 6 or less: → Newborn Resuscitation SOP (pg. 69)
   - If RR < 40: assist with neonatal BVM; → Newborn Resuscitation SOP (pg. 69)
   - If dusky but breathing spontaneously at a rate of ≥ 40/min: Place neonatal NRM 1” from the baby's face with blow-by oxygen at 10 L/min.
5. Place ID tags on the mother and infant with mother's name, delivery date and time, infant gender
6. Obtain 5 minute APGAR score.
7. Transport considerations: Transport baby in an infant car seat secured so the infant rides facing backwards or per local procedure. Pad around infant prn. Do NOT carry infant to ED or OB in rescuer's arms d/t 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

<table>
<thead>
<tr>
<th>Appearance (color)</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue or pale</td>
<td>Blue hands or feet</td>
<td>Entirely pink</td>
<td></td>
</tr>
<tr>
<td>Pulse (heart rate)</td>
<td>Absent</td>
<td>&lt; 100</td>
<td>≥ 100</td>
</tr>
<tr>
<td>Grimace (reflex irritability)</td>
<td>Absent</td>
<td>Grimace</td>
<td>Cough or sneeze</td>
</tr>
<tr>
<td>Activity (muscle tone)</td>
<td>Limp</td>
<td>Some extremity flexion</td>
<td>Active motion</td>
</tr>
<tr>
<td>Respirations (effort)</td>
<td>Absent</td>
<td>Weak cry, &lt; 40</td>
<td>Strong cry</td>
</tr>
</tbody>
</table>

### Infant’s patient care report - Document the following:

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

### MOTHER

1. Placenta should deliver in 20-30 minutes. If delivered, collect in bag from OB kit and transport for inspection. Do NOT pull on cord to facilitate delivery of the placenta.
   **DO NOT DELAY TRANSPORT waiting for PLACENTA to deliver**
2. Mother may be shivering; cover with a blanket
3. If perineum 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:
   - IV NS fluid challenges in 200 mL increments titrated to patient response up to 1 L
   - TXA 1 gm in 100 ml NS IVPB over 10 min
   - 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

BREECH BIRTH

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

1. IMC special considerations:
   - IV NS; anticipate need for pressure infusers
   - Obtain a quick pregnancy history per the Emergency Childbirth SOP (pg.66-67)
   - Prepare for delivery per Emergency Childbirth SOP if birth is imminent

2. Prepare to transport with care enroute if only the buttocks or lower extremities are delivered.
   - Stay on scene for ONE contraction if the baby is delivered to the shoulders, while attempting delivery of the head.
   - If enroute, stop the vehicle to attempt delivery of the head.

Delivery Procedure

3. Legs delivered: Support baby's body wrapped in a towel/chux.
   - If cord is accessible, gently palpate for pulsations. Do not manipulate cord more than necessary.
   - Attempt to loosen the cord to create slack for delivery of the head.

4. After torso and shoulders are delivered: Gently sweep down the arms.
   - If face down may need to lower body to help deliver head. Do not hyperextend the neck.
   - Apply firm pressure over mother's fundus to facilitate delivery of the head.
   - NEVER ATTEMPT TO PULL THE INFANT BY THE LEGS OR TRUNK FROM THE VAGINA.
     May precipitate an entrapped head in an incompletely dilated cervix or it may precipitate nuchal arms

5. The head should deliver in 30 seconds (with the next contraction).
   - If NOT, reach 2 gloved fingers into vagina to locate baby's mouth and pull chin down.
   - Push vaginal wall away from baby's mouth to form an airway.
   - Keep your fingers in place and transport immediately, alerting the receiving hospital of the baby's position.
   - Keep delivered portion of baby's body warm and dry.

6. If head delivers: anticipate neonatal distress. Refer to Newborn Resuscitation SOP as necessary.

7. Anticipate maternal hemorrhage after the birth of the infant. Refer to Post-Partum Care of Mother.

Note: Single limb presentation (arm, leg) or other abnormal presentations may require C-section.

Do NOT attempt field delivery.

PROLAPSED CORD

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

1. IMC special considerations: O₂ 12-15 L/NRM
2. Elevate the mother's hips. Instruct the patient to pant during contractions.
3. Place gloved hand into vagina and place fingers between pubic bone and presenting part, with cord between fingers.
   - Apply continuous steady upward pressure on the presenting part.
4. Avoid cord manipulation as much as possible. Cover with a moist dressing and keep warm.
5. Transport with hand pressure in place.

UTERINE INVERSION

1. IMC special considerations: O₂ 12-15 L/NRM; IV NS titrated to patient response
2. Anticipate significant hemorrhage
   - If only partially extruded: ONE attempt to replace uterus per protocol. Push fundus toward vagina with palm of hand.
   - Apply saline moistened sterile towels or dressings around uterus.
3. TXA 1 Gm in 100mL NS IVPB over 10 min
NEWBORN RESUSCITATION (APGAR = 6 OR LESS)

- Majority of newborns require no resuscitation beyond drying, warming, mild stimulation, and airway suctioning. Those that do may be critically ill and need expeditious transport to a hospital with OB capabilities.
- **Bradycardia** (HR < 100 beats per minute)
- **Acrocyanosis**, blue discoloration of the distal extremities, is a common finding in the newly born infant. Differentiate from central cyanosis.
- **Perivable birth** (Delivery at 20 - 26 wks of gestation): Factors that influence survivability: gestational age; birth weight; gender (female), singleton birth, use of antenatal steroids.

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

Resuscitation is not always mandated on an extremely preterm lifeless baby; every possible intervention may not always need to be offered. Consider parental wishes and call OLMC if any doubt as to the best course of action.

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

<table>
<thead>
<tr>
<th>HR &gt; 100; apneic or significant respiratory distress:</th>
<th>Targeted SpO₂ after birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Ventilate with neonatal BVM at 40-60 BPM on ROOM AIR</td>
<td>1 min 60%-65%</td>
</tr>
<tr>
<td>- Use only enough volume to see chest rise</td>
<td>2 min 65%-70%</td>
</tr>
<tr>
<td>- First breath will require a little more pressure (30-40 cm H₂O) to begin lung inflation</td>
<td>3 min 70%-75%</td>
</tr>
<tr>
<td>- Suction the nose/oropharynx with bulb syringe to remove secretions</td>
<td>4 min 75%-80%</td>
</tr>
<tr>
<td>- Apply peds SpO₂ to right upper extremity (wrist or medial aspect of palm)</td>
<td>5 min 80%-85%</td>
</tr>
<tr>
<td></td>
<td>10 min 85%-95%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Epinephrine dosing repeat q. 3-5 min if indicated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wt.</strong></td>
</tr>
<tr>
<td>1 kg (2.2 lbs)</td>
</tr>
<tr>
<td>2 kg (4.4 lbs)</td>
</tr>
</tbody>
</table>

- **If hypoglycemic; DₐW** 0.5 m/kg (5 mL/kg)

| 2 kg = 10 mL | 3 kg = 15 mL | 4 kg = 20 mL | 5 kg = 25 mL |

5. If apneic/gasping respirations, RR < 40 or central cyanosis

Continue to ventilate at 40-60/neonatal BPM, add 15 L O₂

6. If HR remains < 60 beats/minute despite adequate assisted ventilations for 30 seconds:

- Continue assisted ventilations with 15 L O₂/neonatal BVM (avoid pressure over eyes), and
- **Begin chest compressions** over lower ⅔ of sternum; approx. ⅓ the depth of the chest; using two thumbs-encircling hands for 2 rescuers or 2 fingers at a rate in a 3:1 ratio: 90 compressions & 30 breaths/minute.

7. **If adequate ventilations cannot be achieved by BVM**:

Go to Peds Airway Adjuncts SOP

Continue to attempt ventilations with neonatal BVM and transport.

8. If HR remains < 60/min despite warming, stimulation, 15 L O₂/neonatal BVM and chest compressions:

Assess ECG using peds pads/paddles.

**EPINEPHRINE** (1 mg/10 mL) 0.01 mg/kg (0.1 mL/kg) IVP/IO. If arrest: immediate IO if no other IV access in place.

<table>
<thead>
<tr>
<th>Wt.</th>
<th>Total drug volume</th>
<th>Wt.</th>
<th>Total drug volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kg (2.2 lbs)</td>
<td>0.1 mL</td>
<td>3 kg (6.6 lbs)</td>
<td>0.3 mL</td>
</tr>
<tr>
<td>2 kg (4.4 lbs)</td>
<td>0.2 mL</td>
<td>4 kg (8.8 lbs)</td>
<td>0.4 mL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If hypoglycemic; DₐW 0.5 m/kg (5 mL/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 kg = 10 mL</td>
</tr>
</tbody>
</table>

9. **Assess heel-stick glucose**: Neonatal hypoglycemia - glucose level < 30 mg/dL in first 24 hours of life. Rx as above.

10. **Once ventilations and HR adequate**: Provide warm environment; continue to support ABCs; O₂ neonatal NRM prn
OBSTETRICAL COMPLICATIONS

BLEEDING IN PREGNANCY

Threatened miscarriage / Ectopic pregnancy / Placenta previa / Abruptio placenta

1. IMC special considerations:
   - Position patient on side if > 20 wks gestation
     Raise either side of backboard if spine motion restriction is necessary; manually displace uterus to side
     Obtain BP while patient is positioned on side
   - O₂ 12-15 L by tight fitting mask even w/o respiratory distress until SpO₂ ≥ 96%; SpO₂ must be > 94% for adequate fetal oxygenation.
   - Anticipate significant bleeding/shock. If AMS or signs of hypoperfusion:
     Warm NS IV fluid challenges in 200 mL increments *titrated to patient response*. Repeat as necessary.
     Permissive hypotension is contraindicated in pregnant women. Maintain SBP ≥ 90 (MAP ≥ 65).
   - Obtain pregnancy history per Emergency Childbirth SOP (pg.66-67)
   - Ask about the onset, provocation, quality, region, radiation, severity, and duration of abdominal pain

2. Complete serial abdominal exams per OB Trauma SOP (pg. 65)

3. Note type, color, amount, and nature of vaginal bleeding or discharge
   If tissue is passed, collect and transport to hospital with patient

4. See notes on bleeding/shock in OB Trauma SOP (pg. 65)

PRE-ECLAMPSIA OR HYPERTENSION OF PREGNANCY

HTN in pregnancy: SBP ≥140 and/or DBP ≥90 (ave. of at least 2 measurements taken at least 15 minutes apart)
PLUS any one of the following: moderate to severe fluid retention/edema, rapid weight gain (>10 lbs in one week), headache, diplopia or blurred vision, photophobia, confusion, irritability, AMS, epigastric distress; nausea/vomiting; or claims to be spilling protein in urine.

1. IMC special considerations:
   - GENTLE HANDLING, quiet environment
   - Position patient on side if > 20 wks gestation. Manually displace uterus to the side
     Obtain BP while patient is positioned on side
   - Obtain pregnancy history per Emergency Childbirth SOP (pg. 66); monitor FHTs if possible
   - If AMS: Assess glucose level. Rx per hypoglycemia SOP (pg. 34)
   - Minimal CNS stimulation. Do NOT check pupil light reflex
   - Lights and sirens may be contraindicated. Contact OLMC for orders

2. Anticipate seizures; prepare suction,
   MAGNESIUM (50%) 2 Gm in 16 mL NS (slow IVP) or in 50 mL NS IVPB over 5-10 min. Max 1 Gm / minute.
   Begin on scene, continue enroute. Put gauze moistened in cold water or cold pack over IV site to relieve burning.

If generalized tonic clonic seizure activity (ECLAMPSIA):

3. MAGNESIUM (50%) 2 Gm in 16 mL NS (slow IVP/OI) or in 50 mL NS IVPB over 5-10 min. Max 1 Gm / minute.
   If patient received 2 Gm for preeclampsia prior to experiencing a seizure, may give an additional 2 Gm to Rx seizure

4. If seizure persists after magnesium:
   MIDAZOLAM 2 mg increments IVP/OI q, 30-60 sec (0.2 mg/kg IN) up to 10 mg IVP/OI/IN *titrated to stop seizure.
   If IV/OI unable and IN contraindicated: IM dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   If chronic dx (HF); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
**PEDIATRIC PATIENTS (12 years or younger)**

<table>
<thead>
<tr>
<th>Age definitions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Newborn:</strong></td>
<td>Neonate in first minutes to hours following birth</td>
</tr>
<tr>
<td><strong>Neonate:</strong></td>
<td>Infants in the first 28 days of life</td>
</tr>
</tbody>
</table>

**Special considerations**

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

---

**PEDS INITIAL MEDICAL CARE**

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

1. **Scene size up:** Situational awareness; dynamic risk assessment – Assess/intervene as needed:
   - Scene safety; control and correct hazards; remove pt/crew from unsafe environment ASAP; if potential crime scene, make efforts to preserve integrity of possible evidence
   - Nature of illness; scan environment for clues; POLST orders
   - Universal precautions; use appropriate PPE prn
   - Number of patients; triage / request additional resources if needed. Weigh risk of waiting for resources against benefit of rapid transport to definitive care. Consider if medium or large scale MPI declaration is needed.

2. **PRIMARY ASSESSMENT/RESUSCITATION:** establish rapport with patient/significant others
   - **General impression:** age, gender, preferred position, purposeful movements
   - **Pediatric assessment triangle:** General appearance; work of breathing (WOB); circulation to the skin
     - Observe response to environment (recognize parents/pets/toys), obvious respiratory distress or extreme pain, odors, muscle tone (good or limp), movements (spontaneous/ purposeful), irritable, consolable/non-consolable
     - **Estimate size** using a length-based tape (Broselow or equivalent)
     - **Determine if immediate life threat exists and resuscitate as found**
   - **Level of consciousness** using AVPU or Peds GCS; chief complaint S&S
     - If unconscious, apneic or gasping, & pulseless START high quality CPR per Cardiac Arrest SOP/appendix
   - **AIRWAY:** snoring, gurgling, stridor, silence; consider possible spine injury
     - Initiate **selective spine precautions** if indicated; vomiting/seizure precautions prn
     - Reposition; suction prn using size-appropriate catheter; appropriately-sized airway adjuncts
     - Limit suction application to 5 sec. Monitor ECG for bradycardia during procedure.
     - If child is intubated: **Max suction of -80 to -120 mmHg**; higher suction pressures OK for mouth/pharynx
     - If Obstructed: Go to AIRWAY OBSTRUCTION SOP (pg. 77)
   - **BREATHING/gas exchange/adequacy of ventilations:** Assess/intervene as needed:
     - SpO₂ (before & after O₂ if able) if possible hypoxia, cardioresp. or neuro compromise (normal ≥95%)
     - Unreliable w/ poor peripheral perfusion, CO poisoning, methemoglobinemia.
     - If SpO₂ abnormal; move sensor to central site and reassess.
     - ETCO₂ number & waveform if possible ventilatory/perfusion/metabolic compromise
     - Reduce anxiety if possible to decrease O₂ demand & work of breathing.
   - **Anticipate deterioration or imminent respiratory arrest** if: Increased or decreased RR esp. if accompanied by S&S of distress, increased effort; poor chest excursion; diminished peripheral lung sounds; gasping or grunting; decreased LOC or response to pain; poor skeletal muscle tone; or cyanosis.
Correct hypoxia/assure adequate ventilations: Target SpO₂ ≥ 95%
- O₂ 1-6 L/Peds NC: Adequate rate/depth; minimal distress; SpO₂ 92%-95%
- O₂ 12-15 L/Peds NRM: Adequate rate/depth; mod/severe distress; SpO₂ < 92%
- O₂ 15 L/ Peds BVM: Apnea and/or shallow/inadequate rate/depth with mod/severe distress; unstable Ventililate 1 breath every 3 to 5 sec; just to cause visible chest rise.

- **Circulation / Perfusion / Hydration / ECG:**
  - **Pulse:** General rate (consider activity & stress levels), quality, & regularity of central vs. peripheral pulses
  - **Perfusion:** Mental status; skin: color, temperature, moisture; cap refill on a warm area of the body
  - **Hydration Status:** General appearance (restless, irritable, lethargic, or unconscious; anterior fontanelle in infant, breathing (normal or deep); mucous membranes, skin turgor, presence/absence of tears when crying; urine output (# diapers)

**Conditions requiring rapid assessment and potential cardiopulmonary support:**
- **Monitor ECG if unstable.** Standard size electrodes/defib pads may be used in children > 10 kg.
  Use largest size that fits on chest w/o contact between the pads. Prepare peds defib paddles if no pads.
  **Peds ECG:** PR & QRS intervals shorter. QRS complex narrow if (≤0.09 sec) and wide if (>0.09 sec). Be alert for conduction abnormalities in what looks like “normal” intervals or complex durations in young children. T waves normally inverted V1-V3 up to 8 yrs.
  **Consider need for peds 12 L ECG; based on chief complaint or PMH: same criteria as adults**
  - ALS patients do not necessarily require ongoing ECG monitoring or transmission of a strip to OLMC.
  - If ECG is run, attach/append to PCR/EHR left at, faxed to, or downloaded to, the receiving facility.
  - **Treat rate/rhythm/pump/volume/volume distribution disorders per appropriate SOP.**
  - Most peds arrhythmias caused by hypoxemia, acidosis, or hypotension.
  - **Vascular access:** Actual/potential volume replacement and/or IV meds prior to hospital arrival
  - **0.9% NS – Catheter size, access site, & infusion rate based on pt size, hemodynamic status; SOP or OLMC**
  - Limit time spent gaining venous access in critically ill or injured child; may use IO if unresponsive
  - If hypovolemic: **NS 20 mL/kg IVP/IO in < 20 min.** May repeat X 2 prn. Stop bolus if indication of fluid in lungs.
  - Do not delay transport of time-sensitive pts to establish elective vascular access on scene

*Conditions requiring rapid assessment and/or potential cardiopulmonary support*
- Respiratory rate > 60 breaths/min
- Cyanosis or a decreased SpO₂ despite administration of O₂
- Increased work of breathing (retractions, nasal flaring, grunting), respiratory fatigue and/or failure
- Heart rates: (Weak, tachy, or absent peripheral pulses)
  - Child ≤ 8 years: < 80 BPM or > 180 BPM
  - Child > 8 years: < 60 BPM or > 160 BPM
- Poor perfusion, dysrhythmias; chest pain
- Altered LOC (syncope, unusual irritability or lethargy or failure to respond to parents or painful procedures)
- Seizures
- Trauma
- Fever with petechiae
- Burns involving > 10% BSA
- Post-ingestion of toxic substance
- Hypoglycemia

- **Disability:** Brief pupil check; mental status using peds GCS (see below); ability to move all four extremities.
  If AMS or cardiac arrest - glucose level: If < 70: Treat per Hypoglycemia SOP (pg. 88)
- **Expose** and examine as indicated/Environmental control: keep warm with protected hot packs/blankets/warmers as able

### PEDICATRIC GLASGOW COMA SCORE

<table>
<thead>
<tr>
<th>Eye Opening</th>
<th>Best Verbal Response</th>
<th>Best Motor Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneously</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Oriented/</td>
<td>Oriented, appropriate words/phrases</td>
<td>Moves spontaneously and purposefully; obeys commands</td>
</tr>
<tr>
<td>converses</td>
<td>2-5 years</td>
<td>5</td>
</tr>
<tr>
<td>5 years</td>
<td>2-5 years</td>
<td>5</td>
</tr>
<tr>
<td>To speech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disoriented/</td>
<td>Confused</td>
<td>4</td>
</tr>
<tr>
<td>Converes</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>To pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inappropriate words</td>
<td>Inappropriate words/</td>
<td>Cries to pressure, inconsiderable</td>
</tr>
<tr>
<td>Persistent cry</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>None</td>
<td>Incomp. sounds</td>
<td>Moans/grunts to pain</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>Abnormal extension</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>1</td>
</tr>
<tr>
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<td>None</td>
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</tr>
</tbody>
</table>

**Pediatric Initial Medical Care**

**Region IX Final Mark-up edition 4-22-19**

**Page 72**
3. **SECONDARY ASSESSMENT**

- **Vital signs - BP** *(MAP)*: Obtain 1st BP manually; use size-approp. cuff (min. ⅔ length upper arm), trend pulse pressures; orthostatic changes if indicated; **Pulse**: rate, quality, rhythmicity (appropriate site) count HR 30-60 sec; **Respirations**: rate, pattern, depth; **Temp** if indicated

- **If FEVER**: Assess causes; hydration status. If dehydrated, may attempt IV X 1. If successful: NS 20 mL/kg IVP
  - Passively cool by removing all clothing but diaper/ underwear. Cover lightly. Do not induce shivering.
  - Do not give over-the-counter anti-fever meds unless ordered by OLMC. ASA contraindicated.

- **Chief complaint; Hx of present illness; SAMPLE history**
  - S&S: OPQRST (symptom onset, provocation/palliation, quality, region/recurrent/radiation, severity, time); quantify pain using a pain scale that is consistent with the pt's age, condition, and ability to understand.
    - Age <4 yrs: Observational scale such as FLACC (see appendix)
    - Age 4-12 yrs: Self-report scale such as Wong-Baker Faces, numeric or verbal scales
  - **Allergies** (meds, environment, foods)
  - **Medications** (prescription/over-the-counter – bring containers to hospital if possible)
  - **PMH** (medic-alert jewelry; advance directives; medical devices/implants)
  - **Last oral intake/LMP**
  - **Events** leading to illness. In pts with **syncope, seizure, AMS, cardiac arrest, or acute stroke**: bring witness to hospital or obtain their **contact phone number** to provide to ED.

- **Review of systems** based on chief complaint; S&S; practitioner scope of practice, and pt level of acuity
  - **Head**, eyes, ears, nose, throat/neck; jugular veins
  - **Chest**: Symmetry, chest wall movement; deformity, retractions; lung/heart sounds
  - **Abdomen/pelvis/GU/reproductive organs**: Inspect contour, symmetry; discoloration; pain; changes in function; auscultate bowel sounds; palpate (light); assess for rebound tenderness if S&S peritonitis
  - **Extremities**: Edema, pulses, discoloration; warmth, pain, motor/sensory changes/deficits
  - **Back/Flank**: Pain, discoloration
  - **Neurologic**: Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; 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 SOP**: Pharmacologic and non-pharmacologic options same as Pain Management SOP: parental presence, distraction, topical use of 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.

   - If SBP ≥ minimum for age: Drug indications same as adult Pain Mgt. SOP. **STANDARD DOSING for CHILDREN**:
     - **NITROUS OXIDE** if available
     - **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**: 0.2 mg/kg slow IVP (over 1 min), IN, IM. May repeat after 20 min.

   - **Caveat on Peds sedation**: Children <6 yrs (esp. < 6 mos) may be at greater risk for an adverse event from sedation and/or opiate pain medication. Particularly vulnerable to medication’s effects on ventilatory drive, airway patency and protective airway reflexes – See below.
Safe sedation of children requires a systematic approach that includes the following:

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

- **Ongoing assessment:** Reassess VS 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/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility
  - **Unstable:** More frequent reassessments; continue to reassess all abnormal VS & physical findings

8. **Transport all** infants and children in an approved child restraint system, per the Illinois Child Passenger Protection Act (P.A. 83-8 eff. Jan 1, 2019) that requires children under age 2 years to be properly secured in a rear-facing child restraint system unless the child weighs 40 or more pounds or are 40 or more inches tall. 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 trauma center. **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 2019

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal Systolic BP</th>
<th>Diastolic BP</th>
<th>Hypotension</th>
<th>Heart rate</th>
<th>Resp rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature; neonate</td>
<td>55-75</td>
<td>35-45</td>
<td>&lt;60</td>
<td>110-170</td>
<td>40-70</td>
</tr>
<tr>
<td>0-3 month</td>
<td>65-85</td>
<td>45-55</td>
<td>&lt;70</td>
<td>110-160</td>
<td>35-55</td>
</tr>
<tr>
<td>Infant 4-6 mos</td>
<td>70-90</td>
<td>50-65</td>
<td></td>
<td>110-160</td>
<td>30-45</td>
</tr>
<tr>
<td>Infant 7-12 mos</td>
<td>80-100</td>
<td>55-65</td>
<td></td>
<td>90-160</td>
<td>22-38</td>
</tr>
<tr>
<td>1-3 years</td>
<td>90-105</td>
<td>55-70</td>
<td>1-10 years:</td>
<td>80-150</td>
<td>22-30</td>
</tr>
<tr>
<td>4-6 years</td>
<td>95-110</td>
<td>60-75</td>
<td>&lt;70 + (2 X age in yrs)</td>
<td>70-120</td>
<td>22-34</td>
</tr>
<tr>
<td>7 -12 yr</td>
<td>100-120</td>
<td>60-75</td>
<td></td>
<td>60-110</td>
<td>16-22</td>
</tr>
<tr>
<td>&gt;12</td>
<td>110-130</td>
<td>65-80</td>
<td>&lt;90</td>
<td>60-100</td>
<td>12-20</td>
</tr>
</tbody>
</table>
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 SpO₂ 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 cracks 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 (O₂, apnea monitors, pulse oximeters, BIPAP/CPAP, mechanical ventilators, chest physical therapy vest), IV therapy (central venous catheters), multiple meds, nebulizer machines, feeding tubes and pumps, urinary catheters or dialysis (continuous ambulatory peritoneal dialysis), biotelemetry, ostomy care, orthotic devices, communication or mobility devices, or hospice care.
- Maintain appropriate age/developmental level communication and remain sensitive to parents/caregivers & child.
- Ask parents for child’s daily medical record notebook or medical information form to take to hospital.
- Ask caregiver to accompany EMS to hospital to continue assisting w/ child’s care if possible.

**BLS Interventions:**

1. **Assess and support ABCDs:** Closely monitor airway, RR, HR & mental status. Support airway of those who have difficulty handling oral secretions (severe cerebral palsy, mental retardation). Provide O₂ (or manual resuscitation) when indicated.
   - If child normally has a bluish color or SpO₂ <90%, use extreme caution in giving O₂. 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 **advanced airway** if in respiratory failure
7. **Vascular access** if IV meds or fluids needed. If chronic cardiac condition: IVF only per OLMC. NS 20 mL/kg IVF bolus if hypoperfused. If on anticoagulant like Coumadin (warfarin), use caution when starting IV or when handling child. They bruise easily and may have difficulty clotting.
8. Avoid placing **defib pads** over internal pacemaker generator (usually found in upper chest).
9. Consider use of inopressor (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% “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 O₂ therapy of 2 L or less by NC and presents in respiratory distress, do not give more than 2 L/NC.
  - Increase O₂ delivery with blow-by O₂ or placing a facemask at no less than 6 L/min over child’s nose & mouth.
- Take appropriate steps so child does not inhale noxious fumes from running ambulance.

**Osteogenesis Imperfecta:** Use extreme caution when moving child or taking BP. Use a draw sheet. Hare traction contraindicated.

**Sickle cell disease:**

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

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

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

1. IMC: SpO2 and ETCO2 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: Gag reflex present: ≥ 4 yrs: NPA; No gag reflex (all ages): OPA
3. Airway remains impaired: Consider need for advanced airway (ETT or extraglottic):
   - Persistent airway impairment, ventilatory failure (apnea, RR <12 or >40; shallow/laborered effort; SpO2 ≤ 94;
     increased WOB (retractions, nasal flaring, grunting) → fatigue
   - Inability to ventilate/oxygenate adequately after insertion of OP/NI airway 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 RR ≥ minimum normal for age: O2 12-15 L/(peds) NRM
   IF RR <12 or shallow: O2 15 L/BVM every 3 to 5 sec. pressure & volume just to see chest rise (Target SpO2 ≥95%)
6. Prepare equipment: Drugs & airway equipment (per local procedure)
   - Check suction source; attach rigid tip catheter; prepare advanced airway and cricothyrotomy equipment
   - Select advanced airway based on child’s size, not chronological age
     Measure w/ Broselow tape up to 35 kg
   - Select ETT based on child’s size/or alternate airway (i-gel)

<table>
<thead>
<tr>
<th>Patient Size</th>
<th>Pt wt (kg) (LBS)</th>
<th>Broselow color</th>
<th>NG or Suction size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>5-12 kg</td>
<td>Pink, red, purple</td>
<td>10 Fr.</td>
</tr>
<tr>
<td>Small child</td>
<td>10-25 kg</td>
<td>Yellow, white, blue</td>
<td>10 Fr.</td>
</tr>
<tr>
<td>Large child</td>
<td>25-35 kg</td>
<td>Orange</td>
<td>10 Fr.</td>
</tr>
</tbody>
</table>

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

8. Place advanced airway per procedure: Maintain O2 ≥6 L/NC during procedure
   - Monitor VS, level of consciousness, skin color, ETCO2, SpO2 q. 5 min. during procedure
   - If HR <60 or SpO2 <95%; Pause & give 1 breath q. 3-5 sec w/ O2 15 L/Peds BVM until condition improves.
9. Confirm advanced airway placement
   - Ventilate and observe chest rise; auscultate over epigastrium, bilateral anterior chest, and midaxillary lines
   - Definitive confirmation: ETCO2
10. If successful:
    - O2 15 L/peds BVM ventilate every 3 to 5 seconds just to see chest rise
    - Inflate cuff if present (avoid overinflation): note ET depth: diamond on ETT level w/ teeth or gums (3 X ID ETT)
    - Secure airway with commercial device. Reassess ETCO2 & lung sounds. Apply lateral head immobilization.
    - Assess need for Post-advanced airway sedation and analgesia (PIASA) If SBP >70 + 2 X age or ≥90 if >10 yrs:
      KETAMINE 0.2 mg/kg slow IVP once (If Ketamine not available: MIDAZOLAM standard dose for sedation)
      Consider need for FENTANYL (standard dose) if restless/tachycardic and midazolam used for sedation.
      Continue to monitor ETCO2 to confirm correct placement.
11. If unsuccessful: Ventilate with O2 15 L/peds BVM. May repeat attempt X 1 based on OLMC order
12. If advanced airway unsuccessful and good air exchange w/ peds BVM: Continue ventilations/BVM.
    If unable to place advanced airway or adequately ventilate with BVM: Consider need for cricothyrotomy:
    Children ≤12: needle per SOP; may attempt surgical cricothyrotomy in children 8 - 12 only per OLMC.

If intubated & deteriorates, consider: Displacement of tube, Obstruction of tube, Pneumothorax, Equipment failure (DOPE)
PEDIATRIC FOREIGN BODY AIRWAY OBSTRUCTION

S&S partial airway obstruction:
- Stridor
- Choking
- Tachypnea
- Wheezing
- Grunting
- Tripod position
- Diminished/absent lung sounds
- Hoarseness
- Altered mental status
- Retractions
- Drooling
- Accessory muscle use

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

### CONSCIOUS

**ABLE TO SPEAK, COUGH, or CRY:**
2. **Complete IMC:** Do not interfere with patient's own attempts to clear airway by coughing or sneezing

**CANNOT SPEAK, COUGH, or CRY:**
3. Child 1-12 yrs.: Abdominal thrusts with patient standing or sitting
   - Infant < 1 yr: Up to 5 back slaps and up to 5 chest thrusts
4. **If successful:** Complete Initial Medical Care and transport
5. **If still obstructed:**
   - Repeat step 3 while enroute until effective or patient becomes unresponsive (see below).
   - Monitor for cardiac dysrhythmias and/or arrest.

### UNCONSCIOUS

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

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

**ALS interventions:**
4. **Perform laryngoscopy as soon as possible if available to inspect for F/B. Remove w/ forceps or suction**
5. **Still obstructed and unable to ventilate**
   - Intubate and attempt to push the F/B into right mainstem bronchus, pull ET back and ventilate left lung.
   - Treat per Peds IMC and Peds Airway Adjuncts SOPs.
6. **Consider cricothyrotomy:**
   - 13 and older: needle or surgical; 12 or less: needle; O₂ 12-15 L/BVM
   - May attempt surgical cricothyrotomy in children 8 - 12 only per OLMC
**PEDS RESPIRATORY ARREST**

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: F/B obstruction, respiratory illness, trauma, infection, submersion incident, poisoning/OD, burn/smoke inhalation.
   - If possible high spine injury; provide manual spine precautions while opening airway.

2. **Breathing resumes**
   - Secure airway per Peds IMC; \( \text{O}_2 \) 15 L/peds NRM

3. **If normal perfusion:**
   - Support ABCs; observe
   - Complete primary assessment
   - Keep warm

4. **If possible narcotic/opioid OD:**
   - NALOXONE 0.1 mg/kg (max single dose 1 mg) IVP/IO [ALS] IN/IM [EMR/BLS] w/ repeat doses q/ 30 sec until ventilations increase up to a total dose of 4 mg.

5. **Assess glucose.** If < 70: treat per Peds Hypoglycemia SOP

2. **Breathing not resumed definite pulse present**
   - Ventilate with OPA & peds BVM; 1 breath every 3 -5 sec
   - Unable to ventilate: Peds Airway Adjuncts SOP
   - Recheck pulse every 2 minutes

3. **If hypoperfusion:**
   - Establish vascular access NS IV/IO per Peds IMC
   - Monitor ECG & Rx dysrhythmias per Peds SOPs
   - Refer to shock protocols and support perfusion

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**SUDDEN INFANT DEATH SYNDROME (SIDS)**

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

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

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

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

Classified as lower or higher-risk, based on history and physical examination.

1. Obtain complete history/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 before 37 wks gestation. PMH of cardiac, neurologic, respiratory or chromosomal anomalies; Hx of GERD
4. Complete VS; observe for S&S resp distress (grunting, nasal flaring, retractions); color (pallor, cyanosis, normal)
5. Mental status exam: alert, tired, lethargic, unresponsive, irritable.
6. Physical exam for external S&S of trauma
7. ECG, \( \text{SpO}_2 \), glucose monitoring; support ABCs per peds IMC. All should be transported to EDAP/PCCC.
**PEDS ALLERGIC Reactions/ ANAPHYLACTIC Shock**

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; determine if EpiPen used; ask for child’s Anaphylaxis Emergency Action Plan
   - 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**

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

2. **DIPHENHYDRAMINE 1 mg/kg** (max 50 mg) PO [BLS] or IM (vastus lateralis muscle of the leg) / IVP [ALS]

**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** (vastus lateralis muscle)
   - May repeat X 1 in 5 min prn; DO NOT DELAY TRANSPORT waiting for a response [BLS]
   - If wheezing: **ALBUTEROL 2.5 mg & IPRATROPIOUM 0.5 mg** via HHN/mask. **O2 6 L/NC if SpO2 <95%** [BLS]
   - 4. **DIPHENHYDRAMINE 1 mg/kg** (max 50 mg max) IVP; if no IV: IM. PO OK if no airway compromise or vomiting.

**CRITICAL: Severe SYSTEMIC Reaction/ANAPHYLACTIC SHOCK**

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

**Time sensitive pt**

2. **IMC special considerations:**
   - **EPINEPHRINE (1mg/1mL): <25 kg (54 lbs): 0.15 mg ≥25 kg (55 lbs): 0.3 mg IM** (vastus lateralis muscle)
     - May repeat X 1 in 5 min while establishing IV/IO: [BLS]
   - If airway/ventilations severely compromised: Rx per Peds Airway Adjuncts SOPs or local policy/procedure
   - DO NOT DELAY TRANSPORT waiting for a response

As soon as vascular access is successful:

3. **IV NS fluid challenge 20 mL/kg** IVP/IO; Goal BP adequate for age/size.
   - If persistent hypotension/cardiorespiratory compromise: repeat fluid bolus and give:
     **EPINEPHRINE (1 mg/10mL) 0.01 mg/kg** (max 0.1 mL) increments IV/IO q. 1 min (max total dose 1 mg) [IM + IVP/IO]
     - Reassess after each 0.01 mg/kg. If additional doses are needed; contact OLMC
   - If wheezing: **ALBUTEROL 2.5 mg (3 mL) & IPRATROPIOUM 0.5 mg** /HHN/mask or peds BVM
     - Add O2 6 L/NC if SpO2 <95%. May repeat X 1 enroute. [BLS]. Contact OLMC if additional doses needed.
   - 5. **DIPHENHYDRAMINE 1 mg/kg** (max 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
   - Start 2nd vascular access line; give IVF as rapidly as possible (up to 20 mL/kg) (use pressure infusers if available)
   - **EPINEPHRINE (1mg/10mL) 0.01 mg/kg** up to 1 mg IVP/IO q. 2 min (high dose); treat dysrhythmias per appropriate SOP
PEDS ASTHMA

1. IMC special considerations:
   - Evaluate ventilation/oxygenation (SpO₂), WOB, accessory muscle use, degree of airway obstruction/ resistance, speech/cry, cough, lung sounds, mental status, fatigue, hypoxia, CO₂ 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
   - Airway/Oxygen per Peds Airway Adjuncts SOPs if near apnea, AMS, fatigue, hypoxia, or failure to improve with maximal initial therapy
   - IV access:
     - Mild distress: No IV usually necessary
     - Moderate to severe distress: IV NS titrated to maintain hemodynamic stability
   - Monitor ECG. Bradycardia signals deterioration of patient status

Lower Acuity to EMERGENT: Mild to Moderate distress with wheezing and/or cough variant asthma; 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) SpO₂ ≥95%:

2. ALBUTEROL 2.5 mg (3 mL) & IPRATROPIUM 0.5 mg via HHN or mask
   - Supplement w/O₂ 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; SpO₂ ≤94% Time sensitive pt

2. EPINEPHRINE (1 mg/mL)
   - Typical dosing: <25 kg (54 lbs): 0.15 mg, ≥25 kg (55 lbs): 0.3 mg IM (vastus lateralis muscle) [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
Continue enroute [BLS]. May repeat X 1 as needed.

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

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

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

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

1. IMC special considerations:
   - **Asses level of consciousness:** alert, tired, restless to lethargic, unresponsive
   - **Assess air entry** (normal, mild delay, diminished); **lung sounds** (clear, wheezes, crackles, diminished)
   - **Signs of distress:** (grunting, nasal flaring, retracting, stridor); weak cry or inability to speak full sentences
   - **Color** (pallor, cyanosis, normal)
   - **Hydration status** (+/- sunken eyes, delayed cap refill, moisture of mucus membranes, fontanelles)
   - **If airway/ventilatory distress:** Prepare airway/suction equipment; O₂ 15 L/peds NRM; assess tolerance to O₂ administration; If inadequate ventilations: O₂ per Peds BVM
     Do NOT attempt NPA/OPA, intubation, glottic visualization, or vascular access unless CR collapse.
   - **Avoid agitation.** Hold upright in position of comfort until transport. Transport in sitting position if possible.
   - **Monitor SpO₂** for hypoxia and **ETCO₂** for ventilatory, perfusion, & metabolic deficits if sensors available
   - **Monitor ECG** for changes in heart rate. Bradycardia signals deterioration.

### CROUP:

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

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

2. Nebulize EPINEPHRINE (1 mg/10mL) 0.5 mg (5 mL) w/ 6 L O₂/HHN/mask (aim mist at child's face), or /BVM.
   Do not delay transport setting up medication. Consider possible epiglottitis and Rx as below if obstruction progresses.

### EPIGLOTTITIS:

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

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

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

**CRITICAL:** Moderate to severe cardiorespiratory compromise:

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

2. Nebulize EPINEPHRINE (1 mg/10mL) 0.5 mg (5 mL) w/ 6 L O₂/HHN/mask (aim mist at child's face), or /BVM.
   Position to optimize air exchange (upright); do not delay transport setting up medication.

   - **If continued inadequate ventilations/oxygenation:** Position to optimally open airway; O₂/high flow NC/mask
   - **If ventilatory failure:** 15L O₂/Peds BVM at age-appropriate rate using slow compressions of bag
   - **If unable to ventilate:** Temporarily stop ambulance; airway per Peds Airway Adjuncts SOP: Least invasive way possible
   Be prepared for airway status to worsen after unsuccessful advanced airway attempt.

### Respiratory Syncytial Virus (RSV)/Bronchiolitis:

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

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

**CRITICAL:** Moderate to severe cardiorespiratory compromise:

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

2. Nebulize EPINEPHRINE (1 mg/10mL) 0.5 mg (5 mL) w/ 6 L O₂/HHN/mask (aim mist at child's face), or /BVM.
   Position to optimize air exchange (upright); Do not delay transport setting up medication.

3. **If continued inadequate ventilations/oxygenation:** Position supine in sniffing position; O₂/high flow NC/mask
   **If ventilatory failure:** 15L O₂/Peds BVM at age-appropriate rate using slow compressions of bag
   **If unable to ventilate:** Temporarily stop ambulance; provide airway per Peds Airway Adjuncts SOP: Least invasive way possible.
## PEDS BRADYCARDIA with a PULSE

### Search for and treat possible contributing factors:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Possible Contributing Factors</th>
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<tr>
<td>Hypoxia or ventilation problem</td>
<td>Toxins/poisons/drugs</td>
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<tr>
<td>Hypovolemia</td>
<td>Tamponade, cardiac</td>
</tr>
<tr>
<td>Hydrogen ion (acidosis)</td>
<td>Tension pneumothorax</td>
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<tr>
<td>Hyper/hypokalemia &amp; metabolic disorders</td>
<td>Thrombosis (coronary or pulmonary)</td>
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<tr>
<td>Hypoglycemia</td>
<td>Trauma (hypovolemia, ↑ ICP, brain stem compression)</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Hx. heart surgery (risk sick sinus syndrome or heart block)</td>
</tr>
</tbody>
</table>

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

### LOWER ACUITY: None to mild cardiorespiratory/perfusion compromise

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

2. Assess and support ABCs as needed.

### EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise

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, respiratory difficulty/hypoxic, altered consciousness

2. **IMC special considerations cont.**
   - If unconscious and unresponsive to pain: Airway/ventilations using Peds IMC and Peds Advanced Airway SOP
   - Initiate CPR if HR < 60 in infant/child and poor systemic perfusion despite O₂ and ventilation
   - IV/IO NS TKO: If S&S of hypovolemia: NS 20 mL/kg IVP/IO; may repeat X 2 if necessary
   - ECG monitoring; 12-lead ECG
   - Assess glucose: treat hypoglycemia per PEDs Glucose Emergencies SOP

Check for pulse and rhythm changes after each fluid bolus or drug:

Proceed to next step only if bradycardia & hypoperfusion persists:

3. **EPINEPHRINE** (1mg/10mL) 0.01 mg/kg (0.1 mL/kg) up to 1 mg IVP/IO every 3-5 minutes as needed to achieve SBP >70 + (2 X age in yrs)

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

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

If 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)

3. Initiate external pacing at age-appropriate rate and lowest mA that achieves electrical and mechanical capture unless contraindicated: Pacing not helpful for peds w/ ↓ HR due to post-arrest hypoxia/ischemic myocardial insult, resp. failure, or asystole

*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) q. 2 min up to 10 mg based on size titrated to age-appropriate BP & patient response.

**Pain:** 2 yrs or older, and not contraindicated: 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 OR

**KETAMINE:** 0.3 mg/kg slow IVP (over 1 min), IN, IM (see dose chart appendix). May repeat after 20 min.
**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
- Hyperthermia
- Hypovolemia/dehydration
- Hyper/hypokalemia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Tamponade, cardiac
- Toxins/poisons/drugs
- Tension pneumothorax
- Infection
- Pain
- Thromboembolism, coronary or pulmonary

### Probable Sinus Tachycardia

- History compatible w/ shock (dehydration/hemorrhage)
- P waves present/normal
- HR often varies w/ activity; responsive to stimulation
- Variable RR w/ constant PR
- Infants: HR usually < 220 BPM
- Children: HR usually < 180 BPM

### Probable supraventricular tachycardia (SVT)

- History often vague & nondescriptive
- P waves absent/abnormal
- HR not variable w/ activity
- Abrupt rate changes w/ termination
- Infants: HR usually > 220 BPM
- Children: HR usually > 180 BPM

### Clinical presentations:

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

### IMC special considerations:

- NO cardiorespiratory compromise: Assess and support ABCs; O₂ if SpO₂ <95% or SOB
- Place on cardiac monitor; 12-lead 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 re-evaluation

### Lower Acuity to EMERGENT:

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

#### Critical: SEVERE cardiorespiratory compromise:

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

#### IMC special considerations in conscious patient:

- If IV/IO in place: May give brief trial of meds while preparing for cardioversion. See above.
- IF SBP > 70 + (2X age): Sedation: MIDAZOLAM 0.1 mg/kg IVP/IO (0.2 mg/kg IN) (max single dose 5 mg).
  - May repeat X 1 up to 10 mg based on size and BP. If condition is deteriorating, omit sedation.

#### Synchronized cardioversion at 0.5 - 1 J/kg: QRS regular: 50-100 J  QRS irregular: 120-200 J

- If delays in synchronization and condition critical, go immediately to unsynchronized shocks.

#### Cardioversion unsuccessful: Support ABCs; observe

- Synchronized cardioversion at 2 J/kg: QRS regular: 50-100 J; QRS irregular: 120-200 J
- Re-evaluate rhythm & possible causes (metabolic or toxic). Treat possible causes.
PEDS WIDE COMPLEX TACHYCARDIA with Pulse
Rate > 120 - (QRS 0.1 sec or longer) – VT; SVT with aberrancy, WPW; torsades de pointes

Search for and treat possible contributing factors:
- Hypoxemia • Hypoglycemia
- Hypovolemia/dehydration
- Hypothermia • Hydrogen ion (acidosis)
- Hyper/hypokalemia
- Tamponade, cardiac
- Tension pneumothorax
- Toxins/poisons/drugs
- Thrombosis/thromboembolism
- Pain
- Congenital heart disease
- Cardiomyopathy, myocarditis
- Prolonged QT syndrome.


2. IMC: Support ABCs as needed; determine need for advanced airway management
   - Obtain, review and transmit 12 lead ECG if available; determine rhythm & stability ASAP.
   - If unconscious, defer IV until after cardioversion.
   - Apply appropriate size defib pads if available or prepare peds defib paddles.
   - Assess cardiac rhythm in more than one lead. Assess for S&S of HF.
   - HR varies from near normal to > 300. Confirm wide QRS (>0.08 s in infants; >0.09 s children > 3 years).

EMERGENT: None to Moderate cardiorespiratory compromise
Alert, HR > 150, SBP ≥ 70 + (2x age) or if 10-12 yrs: ≥ 90; normal perfusion and level of consciousness

| Regular Monomorphic VT; polymorphic VT w/ normal QT interval; WPW; Irregular wide complex tachycardia; AF w/ aberrancy; AF w/ WPW (short PR, delta wave) |
| Irregular Polymorphic VT w/ Prolonged QT / Torsades de Pointes |

Contact OLMC first
3. AMIODARONE 5 mg/kg (max 150 mg) in NS to total of 20 mL; slow IVP or (Opt. in 50 mL IVPB on mcgt tubing) over 20 min. Complete dose even if rhythm converts

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

CRITICAL: SEVERE cardiorespiratory compromise:
S&S compromised tissue perfusion, shock, and/or impaired level of consciousness

3. IMC special considerations
   - If IV placed: may give brief trial of meds while preparing for cardioversion. See above.
   - IF SBP > 70 + (2x age): Sedation: MIDAZOLAM 0.1 mg/kg IVP/IO (0.2 mg/kg IN) (max single dose 5 mg).
     May repeat X 1 up to 10 mg based on size and BP. If condition is deteriorating, omit sedation.

4. SYNCHRONIZED CARDIOVERSION at 0.5 – 1 J/kg (100 J) (all but Torsades)
   - Torsades de pointes: DEFIBRILLATE at 0.5 - 1 J/kg
   - HR generally > 220 before cardioversion necessary in children.
   - If not possible to synchronize and clinical condition critical, go immediately to unsynchronized defibrillation
     - Assess ECG and pulse after each shock delivery.
     - Treat post-cardioversion dysrhythmias per appropriate SOP.

5. If cardioversion successful:
   - Complete ALS IMC: Support ABCs; observe; keep warm; transport.
   - If VT returns after successful cardioversion, start protocol at last intervention.

6. If VT persists:
   - Complete ALS IMC; re-evaluate rhythm & possible causes (metabolic or toxic).
     AMIODARONE 5 mg/kg (max 150 mg) mixed with NS to total volume of 20 mL slow IVP or (Alt. in 50 mL IVPB on mcgt tubing) over 20 mins.
   - Synchronized cardioversion at 2 J/kg after ½ of the Amiodarone dose (100 J)
   - Complete the medication even if patient converts after shock delivery provided BP is normal for age.
**AMS:** Consider possible etiologies; use appropriate SOPs

**A:** Alcohol and ingested drugs/toxins; ACS/HF, arrhythmias, anticoagulation

**E:** Endocrine/exocrine, particularly thyroid/liver; electrolyte/fluid imbalances; ECG abnormalities: prolonged QT; Brugada syndrome (incomplete RBBB pattern in V1/V2 w/ ST segment elevation)

**I:** Insulin disorders: hypoglycemia; DKA/HHNS

**O:** O₂ deficit (hypoxia), opiates, overdose, occult blood loss (GI/GU)

**U:** Uremia; other renal causes including hypertensive problems

**T:** (recent) Trauma, temperature changes

**P:** Psychological; massive pulmonary embolism

**S:** Space occupying lesions (epi or subdural, subarachnoid hemorrhage, tumors); stroke, shock, seizures

**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
- Affect: Behavior: consolable or non-consolable agitation
- Cognitive function (recognition of familiar objects; ability to answer simple questions); hallucinations/delusions
- 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 abuse; trauma
- VS: observe for abnormal respiratory patterns; ↑ or ↓ T; orthostatic changes
- Skin: Lesions that may be diagnostic of the etiology
- Neuro exam: Pupils/EOMs; visual deficits; motor/sensory exam; for nuchal rigidity; EMS stroke screen
- Pain: Facial expression, body movements, muscle tension, vocalization; FLACC for Peds.

1. **IMC special considerations:**
- Suction cautiously prn; seizure/vomiting/aspiration precautions
- GCS ≤ 8: Treat per Peds Airway SOP (pg. 76)
- If SpO₂ < 95%; O₂ 12-15 L/Peds NRM or BVM. Assist ventilations at 1 breath every 3-5 sec.
- If SBP < 70 + (2 X Age): IV NS 20 mL/kg IVP. May repeat X 2 if indicated.
- Position patient on side unless contraindicated
- If supine: maintain head and neck in neutral alignment; do not flex the neck
- Monitor ECG continually enroute; **consider need for 12 L ECG (long QT syndromes)**; Rx dysrhythmias per SOP
- Monitor for S&S of ↑ ICP: reduce environmental stimuli
- Document changes in the Peds GCS & VS

2. Obtain and record **blood glucose level** per System procedure
   - If < 70: Treat per Peds Hypoglycemia SOP
   - Observe and record response to treatment; recheck glucose level; may repeat Dextrose prn.
   - If 70 or greater: Observe and continue to assess patient

3. **If possible opiate/synthetic opiate toxicity** w/ AMS and slow RR for age; may have small pupils:
   - **NALOXONE 0.1 mg/kg** (max single dose 1 mg) IV/P [ALS] IN/IM [EMR/BLS] w/ repeat doses q. 30 sec until ventilations increase up to a total dose of 4 mg. 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.
GENERAL APPROACH

1. History: Determine method of injury: ingestion, injected, absorbed, or inhaled; pts often unreliable historians.
2. IMC special considerations:
   - Uncooperative behavior may be due to intoxication/poisoning; assess for underlying pathology
   - Anticipate hypoxia, hypercarbia, respiratory and/or cardiac arrest, hyper or hypotension, dysrhythmias, vomiting, seizures, AMS, coma. Monitor ECG, SpO2, and ETCO2 in all pts with AMS or given sedatives.
   - Assess need for advanced airway if GCS ≤ 8; aspiration risk, airway compromised. See Peds Airway Adjuncts SOP
   - Support ventilations w/ 15L O2/Peds BVM if respiratory depression, hypercarbic ventilatory failure
   - NS IV/IO titrated to adequate perfusion (SBP ≥ 70 + 2X age; 10-12 yrs SBP ≥ 90 ); monitor ECG
   - Monitor ECG if AMS, tachycardic, bradycardic, hypotensive; or HR irregular
   - Impaired patients should be treated and transported. Call OLMC if parent/guardian wishes to refuse transport

3. If AMS, seizure activity, or focal neurologic deficit: Obtain blood glucose; If < 70; treat per Peds Hypoglycemia SOP

   **Possible opiate toxicity** w/AMS + respiratory depression/arrest: NALOXONE 0.1 mg/kg (max single dose 1 mg) IVP/IO [ALS] IN/IM [EMR/BLS] w/ repeat doses every 30 sec until ventilations increase up to a total dose of 4 mg. See Drug Appendix for dosing chart.

   **Anxiety.serotonin syndrome** MIDAZOLAM 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (Max single dose 2 mg) q.2 min up to 10 mg based on size, BP

   **Tonic clonic seizures:** MIDAZOLAM 0.1 mg/kg IVP/IO (0.2 mg/kg IN/IM) (Max single dose 2 mg) q. 30-60 sec up to 10 mg based on size titrated to stop seizures. If seizures persist: Contact OLMC for additional orders.

   **If excited delirium, violent, severe agitation:** KETAMINE 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM . May repeat at ½ dose after 10 min up to max of 4 mg/kg (500 mg). See dosing table in appendix.

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: Adapin, Amitriptyline, Amoxapine, Anafranil, Ascendin, Desipramine, Desyrel, Doxepin, Elavil, Endep, Imipramine, Limbitrol, Ludomil, Norpramine, 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: Barbiturates: Phenobarbital, Seconal (secobarbital); 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)
**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

1. Supportive care; antibiotic therapy if urinary tract infection or pneumonia suspected
2. Antiemetics: Metoclopramide (Reglan starting dose 10 mg IV q 6-8 hr; standard dose 20 mg PO q 6-8 hr) or ondansetron (Zofran) 4 mg q 6-8 hr
3. Antihistamines (if allergic reaction); antihypertensive; anticholinergic
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, NH₃ (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.

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

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

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

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

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

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** (top previous page)
   If excited delirium, violent, severe agitation **KETAMINE standard dose** (top previous page)
6. If hallucinations: quiet environment devoid of stimulation (lights, noise and touch)
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 insulin pump; glucose monitoring devices
   - Determine time and amount of last dose of medication/insulin and last oral intake
   - Vomiting and seizure precautions: prepare suction
   - Obtain and record blood glucose level (heel stick ≤12 mos) if AMS, shock, or respiratory failure

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

S&S Hypoglycemia

<table>
<thead>
<tr>
<th>Mild</th>
<th>Pallor; diaphoresis; shakiness; weakness, fatigue; hunger, anxiety, nervousness, irritability, difficulty concentrating; HA; dizziness; numbness, tingling around mouth and lips; nausea, rapid HR, palpitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>Irritability, agitation, confusion; ataxia; motor weakness; difficulty speaking or slurred speech</td>
</tr>
<tr>
<td>Severe</td>
<td>Confusion to coma; seizures; inability to swallow; cold limbs</td>
</tr>
</tbody>
</table>

Blood glucose ≤ 70 or S & S of hypoglycemia

Hypoglycemic patients with AMS are considered critical. 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 patient is able to swallow: oral glucose in the form of paste, gel, or liquid if available

3. Children and Infants (up to 50 kg or 110 lbs):
   - DEXTROSE 10% (25 g/250 mL) 0.5g/kg up to 25 g (5mL/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.

4. Assess patient response 5 minutes after dextrose administration: Mental status (GCS) and bG level
   - If bG ≥70 : Ongoing assessment
   - If bG <70: Give additional D10% 0.5 g/kg (5 mL/kg) up to 25 g IVPB 5 minutes after initial dose; reassess.

5. If no IV/IO: GLUCAGON < 20 kg (44 lbs):0.5 mg ≥ 20 kg (45 lbs):1 mg IM/IN [BLS] in Vastus lateralis muscle

6. If parent/guardian refuses transport, advise them to feed child before EMS leaves & call child’s PCP to report incident.

DIABETIC KETOACIDOSIS (DKA) or HHNS (CRITICAL)

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
- DKA presents with all 3; EMS personnel shall not assist any patient in administering insulin
- Hyperosmolar hyperglycemic nonketotic syndrome: DT2 w/ high glucoses, dehydration; no acidosis or ketosis

2. IMC special considerations:
   - Monitor ECG for dysrhythmias and changes to T waves
   - IV NS 10 mL/kg IV/IO over 1 hour unless signs of hypovolemic shock or instructed by OLMC to increase 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 10 mg based on size titrated to stop seizure. If seizures persist: Contact OLMC for additional orders.

#### 3. Identify and attempt to correct reversible precipitating causes (see above).
- Obtain **blood glucose** level: If < 70: DEXTROSE or GLUCAGON per Peds Hypoglycemia 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/guardians.
- Passively cool by removing all clothing but diaper/underwear. Cover lightly. Do not induce shivering. Temp may rebound and may cause another seizure.
- NPO (Do not give OTC anti-fever medications unless ordered by OLMC.)
- ASA is contraindicated in unknown viral situations.

### Generalized seizures

<table>
<thead>
<tr>
<th>Tonic clonic (grand mal)</th>
<th>Aura, muscle rigidity, rhythmic jerking, postictal state. Lasts sec to ≥5 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence (petit mal)</td>
<td>Vacant look &amp; is unaware of anything for brief time then returns to normal. No focal tonic-clonic movements.</td>
</tr>
<tr>
<td>Myoclonic</td>
<td>Sudden startle-like episodes (body briefly flexes or extends). Occurs in clusters of 8-10, often multiple X/day.</td>
</tr>
<tr>
<td>Partial seizures</td>
<td></td>
</tr>
<tr>
<td>Simple partial</td>
<td>Limited to one part of brain, affected area directly related to muscle group involved. Child is aware.</td>
</tr>
<tr>
<td>Complex partial</td>
<td>Similar to simple, except child is unconscious</td>
</tr>
<tr>
<td>Psychomotor</td>
<td>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.</td>
</tr>
</tbody>
</table>

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
### Peds Sepsis and Septic Shock

**1. IMC special considerations:**

- **INFECTION:** Rapidly assess for risk factors; S&S suggesting *infection* and infectious source - IF YES
- Assess oxygenation: SpO₂ (use central sensor if pt has poor peripheral perfusion (cold limbs))
- **Assess ETCO₂** (if available): low levels (<31) suggest hyperventilation; poor perfusion to lungs; and/or metabolic acidosis. Correlation between ETCO₂ and venous lactate levels. If ETCO₂ <31:
  - If above present: Assess for pediatrics qSOFA:
    - AMS (GCS <15); assess for disorientation/agitation and/or GCS 1 or more points below patient’s baseline
    - Respiratory distress (↑increased WOB) Capillary refill ≥ 3 sec weak radial pulse; severe tachycardia
    - (note if ≥ 2 criteria are present)
  - **Assess S&S of fluid depletion:** orthostatic VS changes if not hypotensive; poor skin turgor, dry mucosa
  - **Vascular access & IVF:** See below
  - **Assess blood glucose:** anticipate hyperglycemia or hypoglycemia and electrolyte abnormalities

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

*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 and treat specific conditions per appropriate SOP or OLMC.

### SEPSIS:

**Suspect infection + ETCO₂ < 31 + ≥2 pediatrics qSOFA criteria:**

**Age**

1. Call OLMC with a **Sepsis alert** per local policy/procedure.

2. **IVF:** to achieve SBP at least normal for age/size (max 1 L)

### SEPTIC SHOCK:

**Sepsis + SBP <70 + (2X Age) or hypotensive for pt; ETCO₂ likely < 25 (lactate level ≥ 4 mmol/L)**

1. Call OLMC with a **Sepsis alert** per local policy/procedure.

2. Improve perfusion: IV/IO **NS 20 mL/kg** bolus to SBP ≥70 + (2X Age) or normal for child;
   - Reassess VS/skin signs/ETCO₂ q. 5 minutes. (Pts in septic shock may not respond to fluids)

3. **If hypotension persists** – add inopressor while continuing IVF (2nd IV line while IVF continues in 1st)
   - **NOREPINEPHRINE 0.1 mcg/kg/min IVPB** (contact OLMC for additional dosing).
   - Retake BP every 2 min until desired SBP is ≥70+ (2 X Age), then every 5 min.
   - Keep fingers on pulse & watch SpO₂ 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** – tissue hypoxia and acidosis begins BEFORE ↓ BP
PEDS INITIAL TRAUMA CARE

SCENE SIZE UP: Same as adult ITC with the following considerations
- Where/in what position was child found? Was the child secured in an infant/child or booster seat?
- Explore MOI carefully including possible indicators of abuse or neglect.

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

  AIRWAY/SPINE: snoring, gurgling, stridor, silence. Consider possible spine injury
  - Open/maintain using position, suction, adjuncts & manual spine precautions prn (Peds Airway Adjunct SOP pg.76);
  - Once airway controlled: Apply appropriate size c-collar + spine motion restriction if indicated. If backboard used:
    Position infants/children < 2 yrs supine w/ a recess for head or pad under back from shoulders to buttocks
  - Vomiting/seizure precautions as indicated

5. BREATHING/gas exchange/adequacy of ventilations: Assess/intervene as needed
   - Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing)
   - Air movement, symmetry of chest expansion; accessory muscle use; retractions; lung sounds if vent. distress
   - SpO2 if possible hypoxia, cardiorespiratory or neurological compromise. Note before & after O2 if able.
   - ETCO2: number & waveform if possible ventilatory/perfusion/metabolic compromise

Correct hypoxia/assure adequate ventilations: Target SpO2: 95%-100%
- Oxygen 1-6 L/NC: Adequate rate/depth; minimal distress and SpO2 92-94%
- Oxygen 12-15 L/NRM: Adequate rate/depth: mod/severe distress; S&S hypoxia or as specified in protocol
- Oxygen 15 L / BVM: Inadequate rate/depth: mod/severe distress; unstable
  Ventilate at 1 breath every 3 to 5 seconds. Avoid hyperventilation.
- If tension/open pneumothorax or flail chest Rx per adult Chest Trauma SOP

6. CIRCULATION/perfusion: Compare carotid/brachial pulses for presence, general rate, quality, regularity, & equality; assess skin color, temperature, moisture, capillary refill
   - No carotid pulse & unresponsive OR pulse present but < 60 in infant or child with poor perfusion: Begin CPR See Adult Traumatic Arrest SOP; Quality CPR see 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 wound w/ topical hemostatic gauze/ apply direct pressure. Freq. ✓ 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
     If in shock: NS 20 mL/kg IVP up to 1 L based on BP and mental status
     Repeat X 2 if HR, LOC, cap refill & other S&S of perfusion fail to improve. Do not exceed BP targets. Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome
     - Do not delay transport in time-sensitive 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 cardiorespiratory compromise – integrate appropriate SOP

7. Disability: Rapid neuro assessment: Peds GCS; pupils; ability to move all four extremities (S&S ↑ICP or herniation)
   If AMS: blood glucose per System procedure. If < 70: Treat per Hypoglycemia SOP.

8. Pain mgt If > 2 yrs & SBP ≥ minimum for age: Rx per Peds PAIN Mgt in Peds IMC SOP
   Nausea: ONDANSETRON – standard dose per ped peds IMC

9. Expose/environment: Undress to assess as appropriate. Keep patient warm

TRANSPORT DECISION
- Pts meeting Level I or II trauma center criteria are time-sensitive. Attempt to keep scene times ≤10 minutes.
- Transport to nearest appropriate hospital per Region triage criteria or OLMC orders
- Scene use of helicopter based on System Guidelines
Peds ITC: Secondary Assessment

Continue selective spine motion restriction if indicated - see SCI SOP

1. Obtain baseline VS: BP (MAP if able) – Obtain 1st BP manually; trend pulse pressures;
Pulse: rate, quality, rhythmicity  Respiration: 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, PMH (medic-alert jewelry; medical devices/implants);
- Last oral intake/LMP; Events leading to injury

2. Review of Systems: Deformities, contusions, abrasions, punctures/penetrations, burns, lacerations, swelling, tenderness, instability, crepitis, and distal pulses, motor/sensory deficits + the following based on chief complaint; S&S; scope of practice, and pt level of acuity

- HEAD, FACE, EYES, EARS, NOSE, MOUTH: Drainage; re-inspect pupils for size, shape, equality, and reactivity; conjugate movements; gaze palsies; gross visual acuity; eye level (symmetry), open & close jaw; malocclusion.
- NECK: Carotid pulses, jugular veins, sub-q emphysema, c-spines; temporarily remove anterior c-collar to assess neck prn
- CHEST: Auscultate lung/heart sounds
- ABDOMEN: Signs of injury/peritonitis by quadrant: contour, visible pulsations, wounds/bruising patterns, pain referral sites, localized tenderness, guarding, and rigidity
- PELVIS/GU: Inspect perineum for blood at urinary meatus, rectum
- EXTREMITIES: Inspect for position, false motion, skin color, and signs of injury
- BACK/flank: Note any muscle spasms
- Neuro: Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; ataxia
- SKIN/SOFT TISSUE: Color (variation), moisture; temp, lesions/wounds; sub-q emphysema

3. Ongoing assessment: Reassess VS and responses to interventions. Every transported pt should have at least 2 sets of VS at least q. 15 min & after each drug/cardioresp. intervention; take last set shortly before arrival at receiving facility

Unstable: More frequent reassessments; continue to reassess all abnormal VS & physical findings

4. OLMC Report pertinent positive/negative signs as able; any major changes from primary assessment

5. Document Hx and physician exam findings; Pediatric Trauma Score parameters on ePCR/EHR

6. All refusals must have OLMC contact per System policy even if parent /guardian consents to release.

7. Handover report: An EMS “time-out” to allow for an uninterrupted report at hospital is useful to ensure continuity of care - especially if complete written/electronic ePCRs/EHR is not available at time of pt handoff (ACS, 2014).

PEDiATRIC TRAUMA SCoRE: Age 12 and under

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

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

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

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

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

4. If police refuse to assume temporary protective custody, request that they remain at the scene.
   - Contact OLMC; ask an on-line physician to place the child under temporary protective custody.

   **Temporary Protective custody:** A physician is authorized to take temporary protective custody if circumstances of the child are such that in his/her judgment continued stay or return to the custody of the parent, guardian, or custodian, presents an environment dangerous to the child's life or health. (325 ILCS 5/5) (from Ch. 23, par. 2055)
   - If protective custody is secured, transport the child against the parent/guardian wishes.

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

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

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

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

   **DCFS 24 hour hotline number: 1 - 800 - 25 - ABUSE**
   - File a written report with DCFS within 24 hours of filing a verbal report.

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

**Note:** For further information on reporting suspected child abuse, penalties for failing to report and immunity for reporters, refer to system-specific policies.
### CPR/Resuscitation Guidelines for Adults, Children, Infants

<table>
<thead>
<tr>
<th>Age group</th>
<th>Adults</th>
<th>Children</th>
<th>Infants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition of cardiac arrest</td>
<td>Check for responsiveness</td>
<td>No breathing or only gasping – check simultaneously with...</td>
<td>No definite pulse felt within 10 sec; Compressions should start within 10 sec of arrest recognition</td>
</tr>
<tr>
<td>Compression/ventilation ratio before adv airway</td>
<td>30:2 (1 or 2 rescuers)</td>
<td>30:2 - single rescuer; 15:2 – 2 HCP rescuers</td>
<td></td>
</tr>
<tr>
<td>CPR sequence</td>
<td>CAB – unless hypoxia-related arrest (drowning)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression rate</td>
<td>100-120/min (100-110 when using RQP) avoid rate &gt;120 (use audible prompt for correct rate)</td>
<td></td>
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</tr>
<tr>
<td><strong>Compression depth</strong></td>
<td>2” – 2.4” (5-6 cm)</td>
<td>At least ⅔ AP chest depth (~2 in)</td>
<td>At least ⅔ AP chest depth (~1½ in)</td>
</tr>
<tr>
<td><strong>Hand location</strong></td>
<td>2 hands; lower ⅔ of sternum</td>
<td>2 hands or 1 hand (very small child) on lower ⅔ of sternum</td>
<td>1 rescuer: 2 fingers center of chest, just below nipple line, 2 or more rescuers: 2 thumb-encircling hands center of chest, just below nipple line</td>
</tr>
<tr>
<td>Chest wall recoil</td>
<td>Allow full recoil after compression; lift hand slightly off chest</td>
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<tr>
<td>Rotation of compressors</td>
<td>Every 2 min during ECG rhythm checks (should take &lt; 5 sec)</td>
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<tr>
<td>Compression interruptions</td>
<td>Maximize compression time; limit interruptions to &lt; 5 seconds Ideally, pause only for placement of CPR device back plate; ventilations (until advanced airway), rhythm check, &amp; shock delivery (no CPR device)</td>
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<tr>
<td>Use of mechanical chest compression device</td>
<td>May apply per local policy/procedure</td>
<td></td>
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<tr>
<td><strong>Verification of quality (high perfusion) CPR</strong></td>
<td>Capnography between RQP and bag; assess at least q. 2 min (w/ rhythm check) Reflects airway patency and ventilations; prevents hyperventilation (shows rate) If ETCO₂ &lt;10, improve CPR quality; if &lt;10 for 20 min, ROSC unlikely Abrupt &amp; sustained rise seen just before clinical S&amp;S of ROSC (pulses) ETCO₂ levels may decrease 1-2 min after epi due to ↓ pulmonary blood flow</td>
<td></td>
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<tr>
<td><strong>Airways</strong></td>
<td>Head tilt, chin lift (SCI: jaw thrust); BLS airways before BVM ventilations Adv airway: No evidence to support early placement. Consider placing w/o interrupting chest compressions after 3 min preoxygenation; first defib; vasc access; &amp; 1st drugs. Insert sooner if BVM ventilations unsuccessful.</td>
<td></td>
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</tr>
<tr>
<td><strong>Ventilations</strong></td>
<td>Apneic oxygenation: delayed PPV; 3 cycles, O₂/NC 15 L per SOP BVM 2 hands tight face-mask seal during compressions; compressor squeezes bag with volume of 500-600cc; each breath over &lt;1 sec; RQP/ITD attached to mask/adv airway After Adv airway: Do not pause chest compressions for ventilations Avoid hyperventilation (watch rate &amp; volume): Adult: 10/BPM unless asthmatic (6-8/min) Just enough volume for visible chest rise; give O₂: 15L/min when available</td>
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<tr>
<td><strong>Defibrillation</strong></td>
<td>Attach/use AED/cardiac monitor as soon as available Apply pads w/ compressions continuing do CPR while defibrillator is charging Minimize compression pauses to shock (&lt; 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 &amp; multiple shocks: add 2nd set of pads A-P If 2 monitors available – consider dual sequential defibrillation Philips: ↑ defib energy to 200 J; ZOLL biphasic: max = 200 J; Physio LP12/15: max = 360 J</td>
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</table>

### CAPNOGRAPHY

<table>
<thead>
<tr>
<th>ABSENT</th>
<th>DECREASED</th>
<th>INCREASED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M E T A B O L I S M</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malfunction: sensor/monitor ✓ sensor; exhale into</td>
<td>Hypothermia</td>
<td>Hyperthermia; Shivering</td>
</tr>
<tr>
<td>Pain</td>
<td></td>
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<tr>
<td><strong>P E R F U S I O N</strong></td>
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<tr>
<td>Arrest w/o CPR Exsanguination</td>
<td>Shock; cardiac arrest w/ CPR Pulm embolism; ↓ Cardiac output</td>
<td>↑ Cardiac output Reperfusion after ROSC</td>
</tr>
<tr>
<td><strong>V E N T I L A T I O N</strong></td>
<td></td>
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</tr>
<tr>
<td>Apnea; ET extubation; ET obstruction; Esophageal tube</td>
<td>HYPERventilation Bronchospasm; Mucus plugging</td>
<td>HYPOventilation; Resp depression COPD</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<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>
</thead>
<tbody>
<tr>
<td><strong>ACETAMINOPHEN</strong></td>
<td>Tablet: 325 mg</td>
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<td></td>
<td>≥13 and ≥50 kg: 650 mg PO; max 1000 mg</td>
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<td></td>
<td>≥13 and &lt;50 kg: 12.5 mg/kg, max 5 mg/kg</td>
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<tr>
<td></td>
<td></td>
<td>Antipyretic</td>
<td>Minor to mod pain: HA, muscle aches, arthritis,</td>
<td></td>
<td>Severe liver disease</td>
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<tr>
<td></td>
<td></td>
<td>Analgesic</td>
<td>backbone, toothaches, colds, and fever</td>
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<tr>
<td><strong>ADENOSINE</strong></td>
<td>(Adenocard)</td>
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<tr>
<td></td>
<td>Adults: 6 mg rapid IVP followed by 10 mL NS</td>
<td>Class: Endogenous nucleoside; antiarrhythmic</td>
<td>- Symptomatic narrow complex tachycardia (PSVT) unresponsive to vagal maneuvers</td>
<td></td>
<td>Warn pt about flushing (face), SOB, &amp; chest pressure or pain before giving. S&amp;S last &lt;10 sec.</td>
</tr>
<tr>
<td></td>
<td>Repeat dose: 12 mg rapid IVP followed by 10 mL NS</td>
<td>- Temporarily slows/blocks conduction thru AV node</td>
<td>- Asthma -may cause bronchospasm</td>
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<tr>
<td></td>
<td>Peds: 0.1 mg/kg rapid IVP (max 6 mg) followed by 5 mL NS IVP.</td>
<td>- Interrupts AV reentry pathways</td>
<td>- Bradycardia</td>
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<tr>
<td></td>
<td>Repeat dose: 0.2 mg/kg (max 12 mg) followed by 5 mL NS IVP</td>
<td>- Negative chronotropic/dromotropic</td>
<td>- 2° or 3° AVB (except w/ a functioning pacemaker)</td>
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<td></td>
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<td>Very short half life</td>
<td>- SA node disease</td>
<td></td>
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<td></td>
<td></td>
<td>Onset &amp; peak: 10-30 sec</td>
<td>- Will not terminate known AF/A-flutter, but will slow AV conduction to identify</td>
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<td>Duration: 30 sec</td>
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<td>Perform 12L ECG prior to giving</td>
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<td>Proximal IV; use med port closest to pt</td>
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<tr>
<td><strong>ALBUTEROL</strong></td>
<td>(Proventil, Ventolin, ProAir, AccuNeb)</td>
<td>Bronchospasm: 2.5 mg / HHN, mask or neb / CPAP or BVM; O₂ at 6-8 L depending on unit until mist stops (5-15 min). Give 1st dose w/ ipratropium unless contraind. May repeat X 1.</td>
<td>- Selective beta-2 agonist - smooth muscle relaxant causes bronchodilation</td>
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<td></td>
<td>2.5 mg / 3 mL BLS</td>
<td>Hyperkalemia: 5-mg / neb up to 20 mg over 15 min. DO NOT wait for response. Begin Rx &amp; transport ASAP.</td>
<td>- Helps return potassium into cells by activating the sodium potassium pump at the cell membrane</td>
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<td>Onset: 5-15 min Peak: 30-90 min SE from MDIs are blunted by using a spacer device</td>
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<td><strong>AMIODARONE</strong></td>
<td>Adult: VT w/ pulse: 150 mg in 7 mL NS slow IVP over 10 min. (150mg in 100 mL NS IVPB over 10 min)</td>
<td>Antidysrhythmic – predominately Class III; properties of all 4 Vaughan-Williams classes (delays repolarization prolonging action potential; slows AV conduction; prolongs AV refractory period &amp; QT</td>
<td>- Stable VT w/pulse: (regular, wide QRS tachycardia w/ normal QT</td>
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<tr>
<td></td>
<td>Adult VF/PVT: 1st dose: 300 mg IVP/IO; 2nd dose: 150 mg IVP/IO</td>
<td></td>
<td>- VF/PVT</td>
<td></td>
<td>Monitor BP &amp; ECG when given to pt w/ perfusing rhythm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Torsades de Pointes</td>
<td></td>
<td>- VT: If ↓ BP occurs: slow rate or stop drug</td>
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<td></td>
<td></td>
<td></td>
<td>- Less proarrhythmic effects than other class I or III antidysrhythmics</td>
<td></td>
<td>- VF: Post-ROSC. ↓ BP - Rx. w/ fluids/ norepinephrine</td>
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</tbody>
</table>

*Region IX Drug Appendix*

**Severe skin reaction can be fatal: redness or rash that spreads and causes blistersing and peeling.**
<table>
<thead>
<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>
</thead>
<tbody>
<tr>
<td><strong>Calcium gluconate 2.5% gel</strong></td>
<td></td>
<td>Clear, viscous, colorless, odorless, water soluble gel</td>
<td>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</td>
<td><strong>Contraindications:</strong> - Hypercalcemia - Sarcoidosis - Severe hypokalemia</td>
<td><strong>Precautions:</strong> External use only <strong>Helps prevent risk of hypocalcemia from burn</strong></td>
</tr>
<tr>
<td><strong>ASPIRIN</strong> (Acetylsalicylic acid, &quot;ASA&quot;)</td>
<td>324 mg chewable tabs (4 tabs 81 mg) chewed and swallowed while preparing for 12 L Sips of water help dissolve tabs and move drug out of mouth &amp; esophagus where it can irritate lining. Onset: 5-30 min Peak: 15 min – 2 hr</td>
<td><strong>Class:</strong> Salicylate - <strong>Antiplatelet:</strong> Prevents platelet aggregation; blocks formation of thromboxane A2 - Blocks prostaglandin release (antipyretic, analgesic) - Non-steroidal anti-inflammatory drug (NSAID)</td>
<td><strong>Suspected ACS, angina equivalents, &amp; AMI regardless of pain unless contraindicated or an adequate dose of immediate-release ASA can be verified as taken.</strong></td>
<td><strong>Precautions:</strong> Children ≤ 18; AMS Chest pain following recent trauma (esp. head) prior to CT Possible stroke or ICH Current vomiting; surgery within 2 wks, bleeding disorders; ≥ 6 mos pregnant; active peptic ulcer/severe liver disease</td>
<td>- <strong>GI:</strong> Nausea/vomiting; irritation/bleeding - Prolonged bleeding time - Asthma pts may have ASA sensitivity; cause bronchospasm</td>
</tr>
<tr>
<td><strong>ATROPINE</strong></td>
<td>0.02 mg/kg IV/IO Min. 0.1 mg; <strong>Max doses</strong> Child single dose: 0.5 mg Child total dose: 1 mg Adolescent single dose 1 mg Adolescent total dose 2 mg</td>
<td><strong>Class:</strong> Anticholinergic (parasympathetic blocker) - Indirectly ↑ HR and AV conduction - ↓ GI motility - Dries secretions - Dilates bronchioles</td>
<td><strong>Slow administration (resulting in low dose) or dose &lt;0.5 mg in an adult may worsen bradycardia</strong></td>
<td><strong>Contraindications:</strong> - Asymptomatic bradycardia - AVB below His-Purkinje level: 2° AVB M II 3°AVB w/ wide QRS - Unlikely to be effective in pts w/ heart transplant</td>
<td><strong>Caution with:</strong> - Cardiac ischemia or AMI → ↑HR adds to O₂ demand; excessive tachycardia can worsen ischemia/infarction - Avoid in hypothermic bradycardia <strong>Skin:</strong> Warm, dry, flushed Drying of secretions (mouth, nose, eyes, bronchioles) <strong>Eyes:</strong> Dilated (not fixed) pupils, blurred vision (rel. contraindication – narrow-angle glaucoma) <strong>CNS:</strong> Sensorium changes, drowsiness, confusion, HA <strong>CV:</strong> ↑HR; ↑myocardial O₂ demand</td>
</tr>
<tr>
<td><strong>Peds VT:</strong> 5 mg/kg (max 150 mg) mixed with NS to total volume 20 mL IVP or (Alt. in 50 mL IVPB on mcgt tubing) over 20 min. <strong>Peds VF/PVT:</strong> 1st: 5 mg/kg IVP/IO (Max 300 mg) 2nd: 2.5 mg/kg IVP/IO (Max 150 mg)</td>
<td><strong>interval,</strong> slows vent. conduction (widens QRS), blocks Na, K, Ca channels, &amp; α / β receptors - Neg. chronotropic &amp; dromotropic effects - Vasodilates = ↓ cardiac workload and myocardial O₂ consumption</td>
<td></td>
<td></td>
<td><strong>Precautions:</strong> Acquire 12-L before giving to VT w/ pulse or SVT Incompatible with bicarb Liver failure</td>
<td>- Bradycardias - Nausea</td>
</tr>
</tbody>
</table>
| **DuoDote Auto-injector** dosing – see Chemical agents SOP | **Symptomatic bradycardia:** 0.5 mg rapid IVP/IO q. 3-5 min to max.3 mg **Cholinergic poisoning:** See chart Chemical Agents. No dose limit. **Peds:** 0.02 mg/kg IV/IO Min. 0.1 mg; **Max doses** Child single dose: 0.5 mg Child total dose: 1 mg Adolescent single dose 1 mg Adolescent total dose 2 mg | **Class:** Anticholinergic (parasympathetic blocker) - Indirectly ↑ HR and AV conduction - ↓ GI motility - Dries secretions - Dilates bronchioles | | | **CNS:** Sensorium changes, drowsiness, confusion, HA **CV:** ↑HR; ↑myocardial O₂ demand **Eyes:** Dilated (not fixed) pupils, blurred vision (rel. contraindication – narrow-angle glaucoma) **Skin:** Warm, dry, flushed Drying of secretions (mouth, nose, eyes, bronchioles)
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<tr>
<th>Name</th>
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</thead>
<tbody>
<tr>
<td>Diphendaminate</td>
<td>Lower acuity: 1 mg/kg (max 50 mg) PO [BLS] 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 [BLS]; slow IVP/IO over 2 mins; if no IV/IO give IM</td>
<td>Antihistamine: H1 blocker Peak: 1 hr Half-life: 2.5-9 hrs Does not reverse histamine; prevents more from being released. Will not act as fast as epinephrine. - Allergic reactions/ anaphylaxis - Per OLMC: Dystonic reactions due to phenothiazines (Thorazine, Compazine, Stelazine, Prolixin)</td>
<td>Acute asthma attack Hx asthma w/ current allergic reaction – OK to use Precautions: - Do not give sub-q - Peds likely to have CNS stimulation (vs. sedation) - Angle closure glaucoma - Prostatic hypertrophy</td>
<td>CNS: Drowsiness, blurred vision, dilated pupils, hallucinations, vertigo, weakness, ataxia Resp: thickened bronchial secretions CV: ↑ HR; ↓ BP GI: Dry mouth, N / V</td>
<td>Dose and route vary depending on the severity of the condition. Antihistamines are used to treat allergies and asthma. Antihistamines work by blocking the action of histamine, a chemical that triggers allergic reactions. They are available in many forms, including tablets, capsules, creams, and solutions. Antihistamines are also used to relieve symptoms of colds, coughs, and hay fever.</td>
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<td>EPINEPHRINE (Adrenalin)</td>
<td>1mg/1mL IM: BLS</td>
<td>Catecholamine; SNS agonist - acts on alpha &amp; beta adrenergic receptors - dose dependent</td>
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<td>Elderly at higher risk for SE.</td>
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<td>Low dose (&lt; 0.3 mcg/kg/min or &lt;0.5mg) (IM) – β-2 dominates:</td>
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<td>CNS: HA, anxiety, restlessness, dizziness, tremors, excitability, lightheadedness.</td>
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<td>Relaxes bronchial smooth muscle to relieve congestion, edema, wheezing and dyspnea. Inhibits histamine release &amp; antagonizes effects on end organs</td>
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<td>CV: ↑ HR, palpitations, tachydysrhythmias, ventricular ectopy, high dose may produce vasoconstriction, may compromise perfusion; HTN, angina, ↑ myocardial O2 consumption; can cause worsened ischemia.</td>
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<td>Higher dose (&gt; 0.3 mcg/kg/min) (IVP/IO) or ≥0.5 mg: ß + alpha</td>
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<td>Gl: N/V</td>
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<td>- Vasoconstrictor; ↑ SVR &amp; BP; ↓ vascular permeability that, leads to vascular fluid volume loss and hypotension</td>
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<td>Skin: Pallor; necrosis at injection site.</td>
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<td>- Makes CPR more effective:</td>
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<td>- ↑ coronary perf. pressure</td>
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<td>- ↑ brain perfusion</td>
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<td>- ↑ vigor &amp; intensity of VF to ↑ success of defib.</td>
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<td>- Shortens repolarization</td>
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<td>- May generate perfusing rhythm in asystole or bradydysrhythmias</td>
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<td><strong>PUSH DOSE</strong> (subcode) EPI IVP/IO</td>
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<td>Alternative inpressor for bradycardia, cardiogenic or septic shock w/severe hypotension (MAP ≤45 mmHg) &amp; pulse present</td>
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<td><strong>Adults</strong>: Mixing instructions: waste 9 mL of Epi 1mg/10mL (cardiac preload); draw up 9 mL NS (10mg/mL or 1:100,000). Label syringe. Give 0.5 to 2 mL (5-20 mcg) IVP/IO every 2-5 minutes. Onset 1 min; duration 5-10 min; reassess after each increment</td>
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<td><strong>ETOMIDATE</strong> (Amidate)</td>
<td>0.5 mg/kg IVP/IO</td>
<td>Bring unused portion to ED</td>
<td>Sedative-hypnotic without analgesic activity; effects are dose related – light sleep to unconscious</td>
<td>Alternate option to ketamine for sedation prior to advanced airway placement if patient is responsive</td>
<td><strong>Contraindications</strong>  - Septic shock d/t adrenal suppression  - Children less than 10 yrs</td>
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<td><strong>FENTANYL Citrate</strong></td>
<td>Bring unused portion to ED</td>
<td>Class: Synthetic opiate</td>
<td>Treatment of severe pain (7-10)</td>
<td><strong>CONTRAINDICATIONS</strong>  - Intolerance to opiates  - AMS (GCS &lt;15) or inapprop. for age/baseline  - Respiratory depression  - Hypotension  - Acute/severe asthma  - Myasthenia Gravis  - Intermittent pain  - Pts on depressant drugs</td>
<td><strong>RESP</strong>: Avoid over sedation  <strong>CV</strong>: Bradycardia (reverse w/ atropine), hypotension  <strong>CNS</strong>: GCS &lt; 15; sedation, confusion, dizziness, euphoria, seizures  <strong>Uncommon</strong>  <strong>GI</strong>: N/V (give ondansetron)  <strong>MS</strong>: Muscle rigidity, myoclonic movements  - Hives, itching, abd pain, flushing  - Laryngospasm, diaphoresis, spasm of the sphincter of Oddi  - Anaphylaxis</td>
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<tr>
<td><strong>GLUCAGON</strong> (BLS: IM, IN)</td>
<td>Hypoglycemia</td>
<td>Class: Hormone</td>
<td>- ↑ blood glucose: converts liver glycogen stores to glucose</td>
<td>- Hypoglycemia w/o IV/O</td>
<td><strong>GI</strong>: Vomiting common (protect airway before glucagon administration)</td>
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<td>adult no IV: 1 mg IM, IN</td>
<td>- Anaphylaxis/bradycardia</td>
<td>- Cardiac stimulant (+ inotrope) - causes release of catecholamines &amp; stimulates c-AMP in cells to ↑ cardiac output</td>
<td>- Hypoglycemia w/o IV/O</td>
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<tr>
<td><strong>GLUCOSE GEL</strong></td>
<td>25 Gm orally</td>
<td>- Carbohydrate&lt;br&gt;- Increases serum glucose level</td>
<td>Hypoglycemia in awake patients with GCS 14-15 with intact gag reflex.</td>
<td>- AMS (GCS ≤ 13)&lt;br&gt;- Absent gag or impaired airway reflexes&lt;br&gt;- Hx recent seizure activity</td>
<td>Aspiration in patients with impaired airway reflexes</td>
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<td><strong>HYDROXOCOBALAMIN</strong> (Injection), Cyanokit</td>
<td>5 gm IV (one vial) given IVPB over 15 minutes. &lt;br&gt;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.</td>
<td>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 inactuates cyanide &amp; releases cyano-cobalamin-excreted in urine.</td>
<td>Antidote for known or suspected cyanide poisoning.</td>
<td>Common side effects: Red colored urine (chromaturia), erythema, rash, nausea, headache, infusion site reactions&lt;br&gt;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 &amp; dry throat, itching, hot flush. SpO₂ reading may be inaccurate. Possible serious SE: Serious allergic reactions, HTN</td>
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<td><strong>IPRATROPIUM BROMIDE INHALATION SOLUTION, 0.02%</strong> (Atrovent)</td>
<td>Adult: 0.5 mg (1 Unit-Dose Vial) added to albuterol dose/HHN/in-line neb&lt;br&gt;Peds (off label): 0.25-0.5 mg added to albuterol dose/ HHN/in-line neb Onset: 15-30 min Peak: 1-2 hours Duration: 4-8 hours</td>
<td>Class: Synthetic antimuscarinic&lt;br&gt;- Anticholinergic (parasympatholytic) bronchodilator w/ primarily a local, site-specific effect&lt;br&gt;- Cholinergic tone often increased in pts w/ COPD</td>
<td>Bronchospasm assoc. w/ - Mod/severe allergic rxn - COPD/Asthma</td>
<td>Considered relatively safe to use in pregnant women.</td>
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<tr>
<td><strong>KETAMINE</strong> (Ketalar)</td>
<td>IV injection -100 mg/mL concentration should be diluted w/ equal volume of NS assessed and document response including VS, SpO₂ and ETCO₂, GCS, ECG, and pain rating within 5 min after each dose of an opiate or ketamine</td>
<td><strong>Advanced airway</strong>: 2 mg/kg slow IVP (over 1 min)&lt;br&gt;<strong>Aft for pain</strong>: 0.2 mg/kg slow IVP (over 1 min), IM, IN May repeat after 20 min. <strong>Excited delirium</strong>: 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM. May repeat at ½ IVP dose after 10 min to max 4 mg/kg (500 mg). Produces unique combination of hypnotic, analgesic and amnestic effects based on dose&lt;br&gt;N-methyl-D-aspartate (NMDA) receptor antagonist&lt;br&gt;DEA schedule III controlled substance; nonbarbiturate, sedative hypnotic</td>
<td>Sedative prior to advanced airway in responsive pts&lt;br&gt;Sedation for violent behavior; excited delirium or severe agitation&lt;br&gt;Non-narcotic analgesic, especially for those who are opioid tolerant or dependent or have known allergy to fentanyl.&lt;br&gt;After giving: minimize stimulation (verbal/ auditory, tactile, visual).</td>
<td>Withhold if ↑ BP serious hazard&lt;br&gt;- Hypertensive crisis&lt;br&gt;- Use of methamphetamine or similar drug&lt;br&gt;- Acute MI, angina, HF&lt;br&gt;- Intracranial hemorrhage or suspected ↑ ICP&lt;br&gt;- Acute ocular globe injury or glaucoma&lt;br&gt;- Hyperthyroidism&lt;br&gt;- Aortic dissection&lt;br&gt;- Known adrenal tumor&lt;br&gt;- Severe liver disease&lt;br&gt;Caution in patients with active psychosis.&lt;br&gt;Rx emergence reactions w/ midazolam (standard dose for sedation), will ↓ incidence by 50%</td>
<td>CV: Transient ↑ HR &amp; HTN (SBP ↑10-50%); returns to pre-med levels w/in 15 min. Benzodiazepine may decrease CV effects.&lt;br&gt;CNS: Psychosis (5-30%), ↑ ICP; dysphoria&lt;br&gt;MSK: Rigidity, dystonic reaction, depressed reflexes&lt;br&gt;Resp: Beta-adrenergic and vagolytic properties produce bronchodilation; ↑ secretions.&lt;br&gt;Psych: Emergence reactions: disorientation, auditory/visual hallucinations, delirium, irrational behavior 2-24 hrs.</td>
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**Intramuscular injections should have documentation of location and if administered through clothing. The hospital should be notified if given through clothing as this is an unclear penetrating puncture wound.**
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<td><strong>KETOROLAC tromethamine</strong></td>
<td>15 mg IVP or 30 mg IM Peds 2-16: 0.5 mg/kg IV or IM to max 15 mg.</td>
<td>Non-steroidal anti-inflammatory agent; inhibits platelet function</td>
<td>Mod-Severe pain Expect longer onset of action than an opiate</td>
<td>Hypotension (due to renal toxicity) Potential for bleeding (peptic ulcer); renal insufficiency; recent or impending surgery NSAID Allergy; ASA-sensitive asthma; pregnant Caution: if dehydrated or taking ACEIs or ARBs (See HF SOP)</td>
<td>Acute kidney injury Bleeding risk</td>
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<td>injection 30 mg/1mL</td>
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<td><strong>LIDOCAINE 2%</strong> (xylocaine)</td>
<td>IO line: 1 mg/kg (max 50 mg) IO push slowly before flushing line w/ NS</td>
<td>Class: Antiarrhythmic &amp; local anesthetic (amide-type)</td>
<td>IO anesthesia in responsive pts before NS infusion</td>
<td>Contraindications: - Allergy to “caines”, or local amide anesthetics - Bradycardia: Wide complex or AVBs</td>
<td>CNS: Drowsiness, ataxia, disorientation, dizziness, paresthesias, slurred speech, hearing/vision impairment CV: ↓ BP, ↓ HR, dysrhythmias, wide QRS, prolonged QT, cardiac arrest. May worsen conduction disturbances &amp; slow vent. rate.</td>
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<td>100 mg/5 mL</td>
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<td>Observe concentration carefully before administering</td>
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<td><strong>MAGNESIUM SULFATE 50%</strong></td>
<td>ADULT: Critical asthma/ Torsades/Preeclampsia: 2 Gm in16 mL NS (slow IVP) or in 50 mL NS IVPB over 5-10 min. Max 1 Gm / minute. Eclampsia: May repeat adult dose X 1 to total dose of 4 Gm IVP/IO if seizures occur PEDS: Critical asthma/ Torsades: 25 mg/kg (max 2 Gm) mixed with NS to total volume of 20 mL (slow IVP) or (Alt. in 50 mL IVPB on mcgtt tubing) over 10 min. Max 1 Gm/5 min.</td>
<td>- Intracellular cation responsible for metabolic processes &amp; enzymatic reactions. Critical in glycolysis (need for ATP production) - Membrane stabilizer - Blocks neuromuscular transmission and muscular excitability - Class V antidysrhythmic - Acts like a Ca blocker - causes smooth muscle relaxation (vaso and bronchodilator)</td>
<td>- Severe asthma that responds poorly to epi - Torsades de Pointes - Preeclampsia/ eclampsia to prevent/ Rx seizures</td>
<td>Contraindications: - Hypocalcemia - Heart block - Renal dysfunction Precautions: - Continuously monitor ECG RR &amp; BP during administration - Patient on digitalis</td>
<td>Rapid admin ↑ risk: CNS: Lightheadedness, drowsiness, sedation, confusion CV: ↓ HR, dysrhythmia, vasodilation w/ ↓ BP Respiratory: Depression or arrest MS: Weakness, paralysis Skin: Flushing, sweating, pain at injection site (Put gauze moistened in cold water or cold pack over IV site to relieve burning) Metabolic: Hypothermia</td>
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<td>MIDAZOLAM (Versed)</td>
<td>Concentration for IN: 10 mg / 2 mL</td>
<td>Class: Benzodiazepine</td>
<td>- Ongoing sedation after advanced airway</td>
<td>CONTRAINDICATIONS</td>
<td>CNS: Drowsiness, sedation, confusion, amnesia, ataxia</td>
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<td>If SBP ≥ 90 (MAP ≥ 65):</td>
<td>- Sedative/hypnotic</td>
<td>- Anxiety assoc. with transcutaneous pacing</td>
<td>- Glaucoma</td>
<td>Resp: Respiratory depression, arrest</td>
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<td>Adult cardioversion: 5 mg IVP/IN. May repeat X 1 up to 10 mg</td>
<td>- CNS depressant</td>
<td>- Procedural sedation prior to cardioversion</td>
<td>- Hypotension (SBP &lt;90)</td>
<td>CV: Hypotension, bradycardia/tachycardia</td>
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<td>if needed and SBP ≥ 90 (MAP ≥ 65).</td>
<td>- Anxiolysis (+ anxiety)</td>
<td>- Generalized tonic/clonic seizure activity</td>
<td>- Pregnancy unless seizing &amp; unresponsive to magnesium if eclamptic</td>
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<td>Standard dose for cont. sedation; pacing, anxiety,</td>
<td>- Amnestic (anterograde)</td>
<td>- Anxiety</td>
<td>PRECAUTIONS:</td>
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<td>serotonin syndrome; muscle relaxant; stimulant induced HTN:</td>
<td>- Skeletal muscle relaxant</td>
<td>- Muscle relaxant for long bone fractures</td>
<td>Individualize dose based on age, SBP/MAP; weight, physical &amp; clinical status,</td>
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<td>2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to</td>
<td>Potentiates GABA (major CNS inhibitory neurotransmitter). May</td>
<td>- Stimulant (cocaine, amphetamines, ephedrine, PCP) induced severe HTN/tachycardia</td>
<td>pathologic condition, concomitant meds, nature of indication</td>
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<td>10 mg titrated to response</td>
<td>potentiate action of other CNS depressants (Fentanyl, alcohol) –</td>
<td>- Serotonin syndrome</td>
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<td>Generalized tonic clonic seizures: 2 mg increments IVP/IO</td>
<td>monitor closely</td>
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<td>q. 30-60 sec IVP/IO (0.2 mg/kg IN) up to 10 mg titrated to</td>
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<td>stop seizure activity</td>
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<td>If IV/IO unable/IN contraindicated - IM:</td>
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<td>5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.</td>
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<td>All routes: May repeat to 20 mg prn if SBP≥ 90 (MAP ≥ 65)</td>
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<td>unless contraindicated.</td>
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<td>Peds standard dose:</td>
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<td>0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (Max single dose 2 mg)</td>
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<td>q. 2 min up to 10 mg based on size, BP, response.</td>
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<td>MORPHINE</td>
<td>0.1 mg/kg (no more than 2 mg max increments) every 2-3 min</td>
<td>- Narcotic analgesic</td>
<td>SBP ≥ 90 (MAP ≥ 65) Severe pain when fentanyl is indicated</td>
<td>ốn</td>
<td>CNS: Sedation, H/A CV: ↓ SVR, BP, HR Resp: Depression Eyes: Dry eyes, blurred vision GI: N/V Skin: Rash, itching Interactions: Depressive effects enhanced if used w/ other sedatives, ETOH, hypnotics, antihistamines, antiemetics, barbs</td>
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<td>up to 10 mg slow IVP/IO.</td>
<td>- ↓ adverse effects of over activity of the SNS and myocardial O2 demand</td>
<td>Reverse with naloxone</td>
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<td>If no IV/IO: 10 mg IM.</td>
<td>- CNS depressant</td>
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<td>- Mild venous and arterial dilator; ↓ preload &amp; LV afterload</td>
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<td>- Causes histamine release</td>
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**Indications for EMS:**
- Severe pain when fentanyl is indicated
- Ongoing sedation after advanced airway
- Anxiety assoc. with transcutaneous pacing
- Procedural sedation prior to cardioversion
- Generalized tonic/clonic seizure activity
- Anxiety
- Muscle relaxant for long bone fractures
- Stimulant (cocaine, amphetamines, ephedrine, PCP) induced severe HTN/tachycardia
- Serotonin syndrome

**Contraindications / Precautions:**
- Glaucoma
- Hypotension (SBP <90)
- Pregnancy unless seizing & unresponsive to magnesium if eclamptic

**Side Effects:**
- CNS: Drowsiness, sedation, confusion, amnesia, ataxia
- Resp: Respiratory depression, arrest
- CV: Hypotension, bradycardia/tachycardia

**Interactions:**
- Depressive effects enhanced if used w/ other sedatives, ETOH, hypnotics, antihistamines, antiemetics, barbs
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| NALOXONE (Narcan)     | Adult: 1 mg IVP/IN/IO/IM. Repeat q. 30 sec until breathing resumes/improves up to 4 mg. Additional doses: OLMC | Class: Opiate antagonist. Reverses effects of opiate drugs, narcotics / synthetic narcotics. Onset IV/IN: 1-2 min Onset IM: 2-10 min Half life: 30-81 min ½ life of naloxone often shorter than ½ life of narcotic; repeat doses often required | - Narcotic/synthetic narcotic OD w/ AMS & respiratory depression  
- Coma of unknown etiology with respiratory depression  
- May or may not have constricted pupils based on drug combinations | Precautions:  
- Rapid reversal may result in opiate withdrawal syndrome – agitated, combative, uncooperative, rapid HR  
- Give O₂ while prepping med to prevent reversal tachycardia  
- Use with caution in infants of addicted moms or pts dependent on opiates w/ CV disease (contact OLMC) | CNS: Tremor, agitation, combativelessness, seizure (opioid antagonists stimulate the SNS)  
CV: ↑ HR, ↑ BP, dysrhythmias  
Resp: Hyperventilation  
GI: N / V  
Rare anaphylactic reactions & flash pulmonary edema reported after naloxone use. |
| EMR/EMTs IN & IM      |                                          |                                                                        |                                                                                      |                                                                                               |                                                                                  |
| NITROGLYCERIN (NTG)   | 0.4 mg tabs SL or spray May repeat q. 3-5 min up to 3 doses for ACS Unlimited doses for pulm. edema if SBP ≥ 90/ DBP > 60 (MAP ≥ 65) If SBP 90-100 start IV prior to 1st NTG: 200 mL fluid challenge if lungs clear Let tab dissolve naturally; may need to drop NS over tab if mouth is very dry Pt. should sit or lie down when receiving the drug | Class: Organic nitrate, vasodilating agent - Dilates coronary vessels, relieves vasoconstriction, 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  
- Pulmonary edema  
- Hypertensive crisis w/ chest pain/pulm. edema | Other contraindications:  
Recent use of sildenafil (Viagra, Revatio); vardenafil (Levitra, Staxyn) w/ 24 hrs or tadalafil (Cialis, Adcirca) w/ 48 hrs  
Pts receiving IV epoprostenol (Flolan) or treprostil (Remodulin) for pulm. HTN |                                                                                  |
| [Chest pain w/ suspected ischemia: BLS] |                                            |                                                                        |                                                                                      |                                                                                               |                                                                                  |
| NOREPINEPHRINE bitartrate (Levophed) | IVPB into large vein Add 4 mg to 1,000mL D5W or NS. Conc: 4 mcg/mL – label IV bag. Initial dose: 8-12 mcg/min (8mcg=2 mL/min), to reach SBP 90 (MAP ≥ 65). Septic shock may need higher doses. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) Peds: 0.1 mcg/kg/min IVPB | Catecholamine released from sympathetic neurons Inpressor acts on α1 and α2 adrenergic receptors to cause vasoconstriction and an ↑ in peripheral vascular resistance. Beta 1 stimulant: ↑HR, SV, CO Retake BP q. 2 min until target BP reached, then q. 5 min ✓ infusion site frequently for patency. Avoid extravasation – inform OLMC ASAP if it occurs. | Severe hypotension (MAP < 60)  
Vasodilatory shock (septic and neurogenic)  
Cardiogenic shock Safety and effectiveness in pts and pregnant pts not proven. Call OLMC prior to giving Fewer side-effects than dopamine | Hypovolemic shock Do not give NaHCO₃ 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; tachycardia, arrhythmias; ↓ 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 |
<table>
<thead>
<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>
</thead>
<tbody>
<tr>
<td>NORMAL SALINE (0.9% NaCl)</td>
<td>TKO: 15-30 gts/min Fluid challenges: 200 mL increments repeated to achieve/maintain hemodynamic stability</td>
<td>Class: Isotonic crystalloid Contains 154 mEq/L Na ions 154 mEq/L Cl ions</td>
<td>- Need for IV medications</td>
<td>Precautions: Limit volume to BP targets in trauma</td>
<td>- Fluid overload if excess volume/infused too rapidly</td>
</tr>
<tr>
<td></td>
<td><strong>Sepsis:</strong> 200 mL IV boluses in rapid succession (max 30 mL/kg) to SBP ≥90 (MAP ≥65)</td>
<td><strong>Peds:</strong> 20 mL/kg IVP; may repeat X 2 prn</td>
<td></td>
<td></td>
<td>- Pulmonary edema</td>
</tr>
<tr>
<td>NITROUS OXIDE (Nitronox, Entonox)</td>
<td>50% nitrous oxide and 50% oxygen; self-administered by mask</td>
<td>Class: Analgesic gas - CNS depressant - Alters perception of pain Onset: 2-5 min Short duration: 2-5 min</td>
<td>- Pain relief from musculoskeletal trauma, burns, kidney stones - May use to reduce procedural anxiety (IV access)</td>
<td>- AMS; ETOH/drug ingestion - TBI / facial / chest trauma (pneumothorax) - Bowel obstruction - Pregnant females Precaution - COPD – risk of pneumothorax - Use in well ventilated area</td>
<td>- Dizziness, light headedness - Drowsiness / sedation - Bizarre behavior - Slurred speech - Numbness/tingling in face - H/A; N/V</td>
</tr>
<tr>
<td>ONDANSETRON (Zofran) (EMT may give per System policy)</td>
<td><strong>Adults:</strong> 4 mg oral dissolve tablet or 4 mg IVP over no less than 30 sec. May repeat in 10 min to total dose of 8 mg PO or IVP. <strong>Peds:</strong> 0.15mg/kg up to a total of 4 mg IVP or ODT</td>
<td>Selective 5-HT3 (serotonin) receptor antagonist Antiemetic</td>
<td>Nausea/vomiting</td>
<td>Phenyketonuria (PKU): ODT contains aspartame that forms phenylalanine Note: Don’t push ODT through blister foil pkg.; tabs are fragile</td>
<td>Rare: Transient blurred vision after rapid IV infusion HA, lightheadedness Sedation Diarrhea in children</td>
</tr>
<tr>
<td>SODIUM BICARBONATE inj. 8.4% (NaHCO₃)</td>
<td><strong>TCA OD:</strong> 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 <strong>Dialysis/renal failure w/ hyperkalemia; Crush syndrome:</strong> 50 mEq slow IVP/IO over 5 min.</td>
<td>Class: Alkalizing agent - buffers acidosis - Raises serum pH - ↓ uptake of cyclic antidepressants - Shifts K into cells <strong>Notes:</strong> ↓ IV patency before infusing. Flush IV before &amp; after giving.</td>
<td>- 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</td>
<td>- Alkalosis - Inability to ventilate Not useful or effective in hypercarbic acidosis (cardiac arrest and CPR w/o effective ventilations) - Incompatible with catecholamines or Ca agents in same IV line</td>
<td>Electrolyte: Metabolic alkalosis, ↑ Na, ↓ K, hyperosmolality, ↓ Ca, shifts oxyh dissoci. curve to left, inhibits O₂ release to tissues. CV: ↓ VF threshold; impaired cardiac function Skin: Extravasation may cause cellulitis, necrosis, tissue sloughing</td>
</tr>
<tr>
<td>TETRACAINE (0.5% solution Pontocaine)</td>
<td>1 gtt in affected eye; may repeat prn Bottle is single pt. use; give to RN receiving pt.</td>
<td>Topical anesthetic (ester type) for eyes Onset: 25 sec Duration: 15 min or longer</td>
<td>- Facilitate eye irrigation - Pain/spasm of corneal abrasions</td>
<td>- Hypersensitivity to ester-type anesthetics - Inflamed or infected tissue - Severe hypersensitivity to sulfite - Penetrating globe injury</td>
<td>- Local irritation &amp; transient burning sensation; corneal damage w/ excessive use - Hypo or hypertension - Systemic toxicity from CNS stimulation: hearing / visual disturbances; bradycardia, muscle twitching, seizures</td>
</tr>
<tr>
<td>Name</td>
<td>Dose/Route</td>
<td>Action</td>
<td>Indications for EMS</td>
<td>Contraindications / Precautions</td>
<td>Side Effects</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Tranexamic acid (TXA)</td>
<td>Loading bolus: 1 Gm in 100mL NS IVPB (10 mL/min) over 10 min</td>
<td>Anti-fibrinolytic drug and a synthetic equivalent of the amino acid lysine. Helps to reduce mortality in the acutely hemorrhaging adult trauma and OB patient if given within three hours of injury or as soon as post-partum hemorrhage is apparent.</td>
<td>Age ≥ 16 years &lt;3 hrs post bleeding onset - Hemorrhagic shock SBP &lt;90; HR &gt;110 - Multi-system trauma, major pelvic fx, solid organ injury with evidence of active hemorrhage - Traumatic amputations - Post-partum hemorrhage</td>
<td>Subarachnoid hemorrhage; known isolated head injury Active intravascular clotting (DIC) and/or known history of thromboembolism Known Hx renal failure Concomitant use w/ prothrombin complex concentrate (PCC)</td>
<td>Anaphylaxis Thrombosis Nausea, vomiting, diarrhea Visual disturbances: blurred vision, changes in color Hypotension with rapid infusion rate &gt;100 mg/min</td>
</tr>
<tr>
<td>VERAPAMIL</td>
<td>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</td>
<td>Class: Calcium channel blocker - Slows depolarization of slow-channel electrical cells - Slows conduction through AV node to control vent. rate assoc. with rapid atrial rhythms - Relaxes smooth muscle - Dilates coronary arteries - ↓ afterload &amp; myocardial contractility</td>
<td>- Stable SVT unresponsive to vagal maneuvers &amp; adenosine - AF, A-flutter, or multifocal atrial tachycardia (MAT) w/ rapid ventricular response (Rarely converts AF to SR. If AF &gt;48 hr, conversion to SR has risk of embolism) - Angina based on OLMC order</td>
<td>Contraindications - ↓ BP; HF, shock - Wide complex tachycardias of uncertain origin or poisoning/drug-induced tachycardia - 2°-3° AVB w/o function pacemaker; VT - WPW, short PR &amp; sick sinus syndromes - Hypersensitivity - Peds Precautions: May ↓ BP if used w/ ß blockers, nitrates, quinidine</td>
<td>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</td>
</tr>
</tbody>
</table>

**Notes on Drug Routes:** IN generally preferred prior to IM unless contraindicated.

**IM preferred site:** Vastus lateralis muscle mid-lateral thigh  
**IN:** ✓ nostrils for secretions/obstructions; suction; remove NPA; max 1 mL/nostril; divide total dose into 2 syringes; seat MAD tip firmly into nostril; BRISKLY depress syringe plunger to atomize medication. DO NOT have pt inhale while giving.  
**IO contraindications:** Fx in same extremity; infection at insertion site, significant previous orthopedic procedure at the site (IO in past 48 hrs; local vascular compromise; prosthetic limb or joint  
**IO in responsive pt:** Flush w/ lidocaine 1 mg/kg slowly (max 50 mg)  
**All IO:** put IV bag into pressure infuser

**7 RIGHTS of medication administration - RIGHT**

- **Patient:** Confirm absence of allergy  
- **Drug** ✓ package/drug container for name, concentration, integrity, expiration date. Verify sterility of parenteral medication. Prepare dose: controlled substances,  
- **Dose** IV inopressors; and high risk meds (peds dosing/others per protocol) require independent cross-check with qualified practitioner before giving.  
- **Timing of administration:** See drug profile or individual SOP  
- **Reason & site:** See above  
- **Reason:** Must be indicated and not contraindicated for patient  
- **Documentation:** Must note drug, dose, route; time of administration, and patient response for each individual dose
### Ped Doses

Round up to next closest dose that can be given.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Amiodarone 5 mg/kg (150 mg/3 mL)</th>
<th>Atropine 0.02 mg/kg (1 mg/10 mL)</th>
<th>EPINEPHRINE 1 mg/1 mL</th>
<th>FENTANYL 1 mg/2 mL</th>
<th>EPINEPHRINE 1 mg/10 mL</th>
<th>MAGNESIUM 25 mg/kg (up to 2 Gm)</th>
<th>MIDAZOLAM (10 mg/2 mL)</th>
<th>Ondansetron 0.15 mg/kg (4 mg/2 mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lbs</td>
<td>Dose mg / mL</td>
<td>Dose mg / mL</td>
<td>Dose mcg / mL</td>
<td>Dose mg / mL</td>
<td>Dose mg / mL</td>
<td>Dose mg / mL</td>
<td>Dose mg / mL</td>
<td>max single dose</td>
</tr>
<tr>
<td>6.6 lbs= 3 kg</td>
<td>15 mg = 0.3 mL</td>
<td>0.06 mg = 0.6 mL</td>
<td>0.03 mg = 0.3 mL</td>
<td>75 mg = 0.15 mL</td>
<td>0.6 mg = 0.1 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.8 lbs= 4 kg</td>
<td>20 mg = 0.4 mL</td>
<td>0.08 mg = 0.8 mL</td>
<td>0.04 mg = 0.4 mL</td>
<td>100 mg = 0.2 mL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 lbs= 5 kg</td>
<td>25 mg = 0.5 mL</td>
<td>0.1 mg = 1 mL</td>
<td>0.05 mg = 0.5 mL</td>
<td>125 mg = 0.25 mL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 lbs= 6 kg</td>
<td>30 mg = 0.6 mL</td>
<td>0.12 mg = 1.2 mL</td>
<td>0.06 mg = 0.6 mL</td>
<td>150 mg = 0.3 mL</td>
<td>1.2 mg = 0.2 mL</td>
<td>0.9 mg = 0.4 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.4 lbs= 7 kg</td>
<td>35 mg = 0.7 mL</td>
<td>0.14 mg = 1.4 mL</td>
<td>0.07 mg = 0.7 mL</td>
<td>175 mg = 0.35 mL</td>
<td>1 mg = 0.5 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.6 lbs= 8 kg</td>
<td>40 mg = 0.8 mL</td>
<td>0.16 mg = 1.6 mL</td>
<td>0.08 mg = 0.8 mL</td>
<td>200 mg = 0.4 mL</td>
<td>1.6 mg = 0.3 mL</td>
<td>1.2 mg = 0.6 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.8 lbs= 9 kg</td>
<td>45 mg = 0.9 mL</td>
<td>0.18 mg = 1.8 mL</td>
<td>0.09 mg = 0.9 mL</td>
<td>125 mg = 0.45 mL</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>22 lbs= 10 kg</td>
<td>50 mg = 1 mL</td>
<td>0.2 mg = 2 mL</td>
<td>0.1 mg = 0.1 mL</td>
<td>10 mg = 0.2 mL</td>
<td>2 mg = 0.4 mL</td>
<td>1.5 mg = 0.7 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.2 lbs= 11 kg</td>
<td>55 mg = 1.1 mL</td>
<td>0.22 mg = 2.2 mL</td>
<td>0.12 mg = 1.2 mL</td>
<td>300 mg = 0.6 mL</td>
<td>1.8 mg = 0.9 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.4 lbs= 12 kg</td>
<td>60 mg = 1.2 mL</td>
<td>0.24 mg = 2.4 mL</td>
<td>0.12 mg = 1.2 mL</td>
<td>300 mg = 0.6 mL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.6 lbs= 13 kg</td>
<td>67.5 mg = 1.3 mL</td>
<td>0.26 mg = 2.6 mL</td>
<td></td>
<td>325 mg = 0.65 mL</td>
<td>2.5 mg = 0.5 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 lbs= 14 kg</td>
<td>70 mg = 1.4 mL</td>
<td>0.28 mg = 2.8 mL</td>
<td></td>
<td>350 mg = 0.7 mL</td>
<td>2 mg = 1 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 lbs= 15 kg</td>
<td>75 mg = 1.5 mL</td>
<td>0.3 mg = 3 mL</td>
<td>0.15 mg – 0.15 mL</td>
<td>375 mg = 0.75 mL</td>
<td>3 mg = 0.6 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 lbs= 16 kg</td>
<td>80 mg = 1.6 mL</td>
<td>0.32 mg = 3.2 mL</td>
<td></td>
<td>400 mg = 0.8 mL</td>
<td>2.4 mg = 1.2 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 lbs= 18 kg</td>
<td>90 mg = 1.8 mL</td>
<td>0.36 mg = 3.6 mL</td>
<td>0.18 mg = 1.8 mL</td>
<td>450 mg = 0.9 mL</td>
<td>3.6 mg = 0.7 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44 lbs= 20 kg</td>
<td>100 mg = 2 mL</td>
<td>0.4 mg = 4 mL</td>
<td>0.2 mg = 0.2 mL</td>
<td>500 mg = 1 mL</td>
<td>4 mg = 0.8 mL</td>
<td>3 mg = 1.4 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 lbs= 22 kg</td>
<td>110 mg = 2.3 mL</td>
<td>0.44 mg = 4.4 mL</td>
<td>0.22 mg = 2.2 mL</td>
<td></td>
<td>4.4 mg = 0.9 mL</td>
<td>3.3 mg = 1.6 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53 lbs= 24 kg</td>
<td>120 mg = 2.4 mL</td>
<td>0.48 mg = 4.8 mL</td>
<td>0.24 mg = 2.4 mL</td>
<td>600 mg = 1.2 mL</td>
<td>3.6 mg = 1.8 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55 lbs= 25 kg</td>
<td>125 mg = 2.5 mL</td>
<td>0.5 mg – 5 mL</td>
<td>25 mg = 0.5 mL</td>
<td>5 mg – 1 mL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57 lbs= 26 kg</td>
<td>130 mg = 2.6 mL</td>
<td>0.52 mg = 5.2 mL</td>
<td>0.26 mg = 2.6 mL</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62 lbs= 28 kg</td>
<td>140 mg = 2.8 mL</td>
<td>0.56 mg = 5.6 mL</td>
<td>0.28 mg = 2.8 mL</td>
<td>700 mg = 1.4 mL</td>
<td>4 mg = 2 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66 lbs= 30 kg</td>
<td>150 mg = 3 mL</td>
<td>0.6 mg = 6 mL</td>
<td>0.3 mg = 0.3 mL</td>
<td>30 mg = 0.6 mL</td>
<td>6 mg = 1.2 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 lbs= 32 kg</td>
<td>160 mg = 3.2 mL</td>
<td>0.64 mg = 6.4 mL</td>
<td>Max single dose</td>
<td>800 mg = 1.6 mL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75 lbs= 34 kg</td>
<td>170 mg = 3.4 mL</td>
<td>0.68 mg = 6.8 mL</td>
<td></td>
<td>34 mg = 0.7 mL</td>
<td>7.2 mg = 1.4 mL</td>
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</tr>
<tr>
<td>79 lbs= 36 kg</td>
<td>180 mg = 3.6 mL</td>
<td>0.72 mg = 7.2 mL</td>
<td></td>
<td>36 mg = 3.6 mL</td>
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<td></td>
</tr>
<tr>
<td>84 lbs= 38 kg</td>
<td>190 mg = 3.8 mL</td>
<td>0.76 mg = 7.6 mL</td>
<td></td>
<td>38 mg = 3.8 mL</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>88 lbs= 40 kg</td>
<td>200 mg = 4 mL</td>
<td>0.8 mg = 8 mL</td>
<td></td>
<td>40 mg = 0.8 mL</td>
<td></td>
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<tr>
<td>99 lbs= 45 kg</td>
<td>225 mg = 4.5 mL</td>
<td>0.9 mg = 9 mL</td>
<td></td>
<td>45 mg = 4.5 mL</td>
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<tr>
<td>110-128 lbs/50-58 kg</td>
<td>250 mg = 5 mL</td>
<td>1 mg = 10 mL</td>
<td>50 mcg = 1 mL</td>
<td>1.25 Gm = 2.4 mL</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
### Peds CARDIOVERIONS / DEFIBRILLATION J/kg

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

### 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

<table>
<thead>
<tr>
<th>Weight</th>
<th>1 mcg/kg</th>
<th>0.5 mcg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>See peds tablet</td>
<td></td>
<td>above for smaller adults</td>
</tr>
<tr>
<td>132-150 lbs</td>
<td>60 mcg = 1.2 mL</td>
<td>30 mcg = 0.6 mL</td>
</tr>
<tr>
<td>154-172 lbs</td>
<td>70 mcg = 1.4 mL</td>
<td>35 mcg = 0.7 mL</td>
</tr>
<tr>
<td>176-194 lbs</td>
<td>80 mcg = 1.6 mL</td>
<td>40 mcg = 0.8 mL</td>
</tr>
<tr>
<td>198-216 lbs</td>
<td>90 mcg = 1.8 mL</td>
<td>45 mcg = 0.9 mL</td>
</tr>
<tr>
<td>220-238+ lbs</td>
<td>100 mcg = 2 mL</td>
<td>50 mcg = 1 mL</td>
</tr>
</tbody>
</table>

### 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

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

### Peds NALOXONE DOSING

**Concentration:** 2mg / 2mL  
0.1 mg/kg (max single dose 1 mg) IV/IN/IO/IM; repeat doses q. 30 sec until ventilations increase up to a max total dose of 4 mg.

<table>
<thead>
<tr>
<th>Weight</th>
<th>0.3 mg = 0.3 mL</th>
<th>0.8 mg = 0.8 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.6 lbs = 3 kg</td>
<td>17.6 lbs = 8 kg</td>
<td>17.6 lbs = 8 kg</td>
</tr>
<tr>
<td>8.8 lbs = 4 kg</td>
<td>19.8 lbs = 9 kg</td>
<td>19.8 lbs = 9 kg</td>
</tr>
<tr>
<td>11 lbs = 5 kg</td>
<td>22 lbs = 10 kg</td>
<td>22 lbs = 10 kg</td>
</tr>
<tr>
<td>13.2 lbs = 6 kg</td>
<td>26 lbs = 13 kg</td>
<td>26 lbs = 13 kg</td>
</tr>
<tr>
<td>15.4 lbs = 7 kg</td>
<td>29 lbs = 16 kg</td>
<td>29 lbs = 16 kg</td>
</tr>
</tbody>
</table>

Above 22 lbs  
1 mg = 1 mL
### Maximum QT Intervals based on Heart Rate

<table>
<thead>
<tr>
<th>HR (min)</th>
<th>RR Interval (sec)</th>
<th>Upper limits normal QT (sec)</th>
<th>HR (min)</th>
<th>RR Interval (sec)</th>
<th>Upper limits normal QT (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreasing</td>
<td>Increasing</td>
<td><strong>Men</strong> Increasing</td>
<td><strong>Women</strong> Increasing</td>
<td>Decreasing</td>
<td>Increasing</td>
</tr>
<tr>
<td>150</td>
<td>0.4</td>
<td>0.25</td>
<td>0.28</td>
<td>75</td>
<td>0.6</td>
</tr>
<tr>
<td>136</td>
<td>0.44</td>
<td>0.26</td>
<td>0.29</td>
<td>71</td>
<td>0.64</td>
</tr>
<tr>
<td>125</td>
<td>0.48</td>
<td>0.28</td>
<td>0.3</td>
<td>68</td>
<td>0.88</td>
</tr>
<tr>
<td>115</td>
<td>0.52</td>
<td>0.29</td>
<td>0.32</td>
<td>65</td>
<td>0.92</td>
</tr>
<tr>
<td>107</td>
<td>0.56</td>
<td>0.3</td>
<td>0.33</td>
<td>62</td>
<td>0.96</td>
</tr>
<tr>
<td>100</td>
<td>0.6</td>
<td>0.31</td>
<td>0.34</td>
<td>60</td>
<td>1</td>
</tr>
<tr>
<td>93</td>
<td>0.64</td>
<td>0.32</td>
<td>0.35</td>
<td>57</td>
<td>1.04</td>
</tr>
<tr>
<td>88</td>
<td>0.68</td>
<td>0.33</td>
<td>0.36</td>
<td>52</td>
<td>1.08</td>
</tr>
<tr>
<td>78</td>
<td>0.72</td>
<td>0.35</td>
<td>0.38</td>
<td>50</td>
<td>1.2</td>
</tr>
</tbody>
</table>

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

### 12-L ECG Indications (Angina or Anginal Equivalents):
- Discomfort (nose to navel, shoulder, arm, back)
- SOB/HF
- Palpitations
- Diaphoresis
- Risk factors: HTN Smoking Diabetes Cholesterol high Age MI / HF

**Lead Placement**

- **V 1**: 4th ICS - R of sternum
- **V 2**: 4th ICS - L of sternum
- **V 3**: Midway between V2 & V4
- **V 4**: 5th ICS Mid-clavicular line
- **V 5**: Ant-axillary line, level w/ V4
- **V 6**: Mid-axillary line, level w/ V4

**ISCHEMIA:**
- **12 L CHANGES**
- **Hyperacute T wave**: (sensitive, not specific, may occur early)
- **T wave inversion**: (flipped - may precede ST elevation)
- **ST depression**: (consider reciprocal changes)

**INJURY:**
- **ST elevation (STEMI)**: (>1mm (sm box) in 2 or > contiguous leads)
- **INFARCTION:**
  - **Q waves** (New or old?): (> 0.04 sec/sm box; >25% height QRS)

**Leads w/ Changes & Infarct Locations**

<table>
<thead>
<tr>
<th>Leads w/ Changes &amp; Infarct Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>I  Lateral aVR V1 Septal V4 Anterior</td>
</tr>
<tr>
<td>II Inferior aVL Lateral V2 Septal V5 Lateral</td>
</tr>
<tr>
<td>III Inferior aVF Inferior V3 Anterior V6 Lateral</td>
</tr>
</tbody>
</table>
### APPROVED Acronyms and Abbreviations

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

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

**C**  
Ca ............................................. calcium  
CAD ........................................... coronary artery disease  
CC ............................................. chief complaint  
C-Collar .................................... cervical collar  
cm ............................................ centimeter  
CMS ........................................... circulation, motor, sensation  
CNS ........................................... central nervous system  
c/o ............................................ complains of  
CO ........................................... carbon monoxide  
CO2 .......................................... carbon dioxide  
COPD ........................................ chronic obstructive pulmonary disease  
CPAP ........................................ continuous positive airway pressure  
CPR ........................................... cardiopulmonary resuscitation  
CSF ........................................... cerebral spinal fluid  
CshN .......................................... children with special healthcare needs  
CV or CVD .................................. cardiovascular disease  

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

**E**  
ECG or EKG ............................. electrocardiogram  
ECRN ............................... Emergency Communications RN  
ED ........................................... emergency department  
EMS ........................................... Emergency Medical Services  
EMS MD ............................... EMS Medical Director  
EMSS ...................................... Emergency Medical Services System  
EMT ........................................... Emergency Medical Technician  
EOMs ....................................... extracranial movements  
EOR ........................................... end of report  
ETI ........................................... endotracheal intubation  
ETCO2 .................................... end tidal carbon dioxide (capnography)  
ETA ........................................... estimated time of arrival  

**F**  
FB ............................................ foreign body  
FiO2 ...................................... fraction of inspired O2 (% O2 delivered)  
Fr ............................................. French (catheter/tube diameter)  
Fx/Fx ...................................... fracture  

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

**H**  
h or hr .................................... hour  
HA ........................................... headache  
H2O ......................................... water  
HCO3 ....................................... bicarbonate  
HEPA ....................................... high efficiency particulate airbone mask  
HF ........................................... heart failure  
HN ........................................... hand held nebulizer  
HHNS .................................... hyperosmolar hyperglycemic nonketotic syndrome  
HR ........................................... heart rate  
HTN ........................................ hypertension  
Hx ............................................ history  

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

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

**K**  
KED ....................................... Kendrick extrication device  
kg .......................................... kilogram  

**L**  
l ............................................. liter  
lbs ......................................... pounds  
LLQ ......................................... left lower quadrant
L/minute .................................................... liters per minute
LMP ........................................................ last menstrual period
LOC ........................................................ level of consciousness
LUQ .......................................................... left upper quadrant
LV ........................................................... left ventricle
LVAD .......................................................... left ventricular assist device
mA .......................................................... milliamps (pacing)
MAP ........................................................ mean arterial pressure
MAT ........................................................ multifocal atrial tachycardia
mcg ........................................................... microgram
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
MVO ........................................................ motor vehicle crash
N ............................................................... nasal cannula
NEMSIS ................................................ National EMS Information System
NP/NPA ...................................................... nasopharyngeal airway
NPO ........................................................ nothing by mouth
NRM ........................................................ non-rebreather mask
NS ............................................................ normal saline
NSR ........................................................ normal sinus rhythm
NTG ........................................................ nitroglycerin
N/V .......................................................... nausea/vomiting
O2 ............................................................... oxygen
OB ............................................................ obstetric
OP/OPA ...................................................... oropharyngeal airway
Oriented X 1 ............................................... oriented to person
Oriented X 2 ............................................... oriented to person, place
Oriented X 3 ............................................... oriented to person, place, time
Oriented X 4 ............................................... oriented to person, place, time, event
P ............................................................... pulse
PCI ........................................................... percutaneous intervention
PCP ........................................................ Primary Care Practitioner
pCO₂ or PaCO₂ ........................................... 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 .......................................................... pelvic inflammatory disease
PND ........................................................ paroxysmal nocturnal dyspnea
PO ............................................................. per os (by mouth)
pO₂ ........................................................... 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 ............................................................... every

R ............................................................... respirations
RA .......................................................... room air
RBOW ...................................................... ruptured bag of waters
RN .......................................................... Registered Nurse
R/O ........................................................... rule out
Rh ............................................................ rhesus factor (blood + or -)
ROM ........................................................ range of motion
ROSC ...................................................... return of spontaneous circulation
RR ............................................................ respiratory rate
RSV ........................................................ respiratory syncytial virus
Rt ............................................................. right
RTS ........................................................ revised trauma score
RUQ ........................................................ right upper quadrant
SAH ........................................................ subarachnoid hemorrhage
SBP ........................................................ systolic blood pressure
SCI .......................................................... spinal cord injury
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
SpO₂ ........................................................ pulse oximetry
S&S .......................................................... signs & symptoms
STD ........................................................ sexually transmitted disease
Sub-Q ........................................................ subcutaneous
SVR ........................................................ systemic vascular resistance
SVT ........................................................ supraventricular tachycardia
T ............................................................... temperature
TB ............................................................ tuberculosis
TBI .......................................................... traumatic brain injury
TIA .......................................................... transient ischemic attack
TKO ........................................................ to keep open
TPN ........................................................ total parenteral nutrition
Tx or Rx .................................................. treatment
URI ........................................................ upper respiratory infection
UTI ........................................................ urinary tract infection
V ............................................................... ventricular fibrillation
V-fib or VF ................................................. ventricular fibrillation
VS ............................................................ ventricular septal defect
V-tach or VT .............................................. ventricular tachycardia
VT ........................................................... tidal volume
W ............................................................. with
WNL ........................................................ within normal limits
w/o .......................................................... without
WOB ........................................................ work of breathing
y/o ........................................................... year old

Symbols
α .......................................................... α equal to or greater than
@ .......................................................... ≤ equal to or less than
β .......................................................... + positive or plus
° .......................................................... ° degree
# .......................................................... # number
↑ .......................................................... ↑ increased or decreased
↓ .......................................................... ↓ increased or decreased
~ .......................................................... ~ approximately

Region IX Final Mark-up edition 4-22-19
### Differential for SOB

<table>
<thead>
<tr>
<th>S&amp;S</th>
<th>HF/PE</th>
<th>AMI</th>
<th>COPD</th>
<th>Pneumonia</th>
</tr>
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<tbody>
<tr>
<td>SOB</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Cough</td>
<td>-/+</td>
<td>-</td>
<td>+ / early am</td>
<td>+</td>
</tr>
<tr>
<td>Sputum</td>
<td>Frothy (pink)</td>
<td>-</td>
<td>Clear</td>
<td>Yellow/green</td>
</tr>
<tr>
<td>Fever</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Sweats</td>
<td>+ Cold/moist</td>
<td>+ Cold/moist</td>
<td>-</td>
<td>+ / Hot</td>
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<td>Chest pain</td>
<td>-</td>
<td>+/-</td>
<td>-</td>
<td>+/-</td>
</tr>
<tr>
<td>Chest pain nature</td>
<td>-</td>
<td>Heavy, tight</td>
<td>-</td>
<td>Sharp, pleuritic</td>
</tr>
<tr>
<td>Chest pain duration</td>
<td>-</td>
<td>-</td>
<td>Gradually worsening, then constant</td>
<td></td>
</tr>
<tr>
<td>Smoking Hx</td>
<td>+ Risk</td>
<td>+ Risk</td>
<td>Almost always</td>
<td>+/-</td>
</tr>
<tr>
<td>Hypertension</td>
<td>+ Risk</td>
<td>+ Risk</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>+/-</td>
<td>+/-</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Air entry to lungs</td>
<td>Good upper/worse at bases</td>
<td>Good</td>
<td>Poor</td>
<td>Patchy</td>
</tr>
<tr>
<td>Wheezing</td>
<td>+/-</td>
<td>+/-</td>
<td>Must have air entry to wheeze</td>
<td>+/- patchy</td>
</tr>
<tr>
<td>Crackles</td>
<td>+</td>
<td>with HF/otherwise clear</td>
<td>-</td>
<td>+ patchy; isolated to infected lobes</td>
</tr>
<tr>
<td>BP</td>
<td>↑ is a risk factor; ↓ if severe S&amp;S</td>
<td>↑ is a risk factor; ↓ if severe S&amp;S</td>
<td>Usually unaffected; ↓ if severe S&amp;S</td>
<td>Usually unaffected</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>+/-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

### Heart Failure

- PMH/meds for: CVD, CAD, MI, HF, HTN, cardiomyopathy, high cholesterol, ICD, bivent, pacing, DM, renal failure, smoking, alcoholism
- meds: See list on HF SOP p. 22
- Paroxysmal nocturnal dyspnea
- Orthopnea (multiple pillows to sleep)
- Dyspnea on exertion
- Cough: (non-productive or productive; frothy, clear, white, pink)
- Wt gain (tight shoes, belt, watch, rings)
- Fatigue
- Crackles or wheezes
- **Capnograph:** square waveform
- 12-L abnormal (acute MI, AF, LVH, ischemia, BBB, "age-undetermined infarct")
- S3 (3rd heart sound, after lub-dub, best heard at apex)
- JVD, pedal edema (RHF)

### 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)

### CPAP – per local procedure

**Indications:** 18 yrs of age; alert w/ intact airway & ventilatory drive (Pts you may expect to intubate if untreated)
- *Cardiogenic pulmonary edema w/ hemodynamic stability
- Submersion incident
- Elderly patients with if O2 via NC or NRM is ineffective
- Pts with POLST order w/ severe resp distress declining ETI

**Contraindications:** Younger than 18 years of age
- AMS: aspiration risk; inability to clear secretions; questionable ability to protect airway
- Need for immediate airway control, need for assist/control ventilation with BVM, facial burns. Advanced airway shall be considered if there is evidence of imminent cardiopulmonary arrest, decreased level of consciousness, severe hypotension, near-apnea, and/or copious frothy sputum.
- Unstable respiratory drive; ventilatory failure
- Hypotension *SBP ≤ 90 & DBP < 60* or ECG instability
- Gastric distention; impaired swallowing, persistent vomiting, active upper GI bleeding; possible esophageal rupture
- Compromise of thoracic organs (penetrating chest trauma, pneumothorax)
- Uncooperative pt or those unable to tolerate mask due to extreme anxiety, claustrophobia, or pain
- Recent upper airway or esophageal surgery
- Possible increased ICP: Evidenced by decreased LOC; HTN; abnormal pupils
- Facial abnormalities/trauma that complicate mask seal (facial burns) and result in a significant air leak, epistaxis

**On-going care/monitoring**
- *Reassess VS; RR/depth & lung sounds, SpO₂, ETCO₂ q. 3-5 min after CPAP applied:
- *If BP drops (excess intrathoracic pressure), gradually reduce PEEP from 10 to 5. If SBP <90 (MAP <65) remove CPAP.*
### Characteristics of Biologic, Nuclear, Incendiary, and Chemical Agents

#### BIOLOGIC AGENT CHARACTERISTICS

<table>
<thead>
<tr>
<th>Disease</th>
<th>Transmitted man to man</th>
<th>Incubation Period</th>
<th>Duration of Illness</th>
<th>Lethality (approx. case-fatality rates)</th>
<th>Persistence of Organism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation anthrax</td>
<td>No</td>
<td>1-6 days</td>
<td>3-5 d (usually fatal if no Rx)</td>
<td>High</td>
<td>Very stable: spores remain viable&gt;40 yrs in soil</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>No</td>
<td>5-60 days (usually 1-2 m)</td>
<td>Weeks to months</td>
<td>&lt;5% if untreated</td>
<td>Very stable</td>
</tr>
<tr>
<td>Pneumonic plague</td>
<td>High</td>
<td>2-3 days</td>
<td>1-6 days (usually fatal)</td>
<td>High unless Rx in 12-24 h</td>
<td>Up to 1 yr in soil; 270 d in live tissue</td>
</tr>
<tr>
<td>Tularemia</td>
<td>No</td>
<td>2-10 d (ave 3-5)</td>
<td>≥2 weeks</td>
<td>Moderate if untreated</td>
<td>Months (in moist soil/other media)</td>
</tr>
<tr>
<td>Q Fever</td>
<td>Rare</td>
<td>10-40 days</td>
<td>2-14 days</td>
<td>Very low</td>
<td>Months (on wood and sand)</td>
</tr>
<tr>
<td>Smallpox</td>
<td>High</td>
<td>7-17 d (ave 12)</td>
<td>4 weeks</td>
<td>High to moderate</td>
<td>Very stable</td>
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<tr>
<td>Venezuelan equine</td>
<td>Low</td>
<td>2-6 days</td>
<td>Days to weeks</td>
<td>Low</td>
<td>Relatively unstable</td>
</tr>
<tr>
<td>Encephalitis</td>
<td></td>
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<tr>
<td>Viral hemorrhagic</td>
<td>Moderate</td>
<td>4-21 days</td>
<td>Death in 7-16 days</td>
<td>Zaire strain: high</td>
<td>Std. unstable (depends on agent)</td>
</tr>
<tr>
<td>FEVERS</td>
<td></td>
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<td></td>
<td>Sudan strain: moderate</td>
<td></td>
</tr>
<tr>
<td>Botulism</td>
<td>No</td>
<td>1-5 days</td>
<td>Death in 24-72 hours; non-lethal illness lasts months</td>
<td>High unless respiratory support provided</td>
<td>Weeks (in nonmoving H2O &amp; food)</td>
</tr>
<tr>
<td>Staph enterotoxin B</td>
<td>No</td>
<td>3-12 h after inhalation</td>
<td>Hours</td>
<td>&lt;1%</td>
<td>Resistant to freezing</td>
</tr>
<tr>
<td>Ricin</td>
<td>No</td>
<td>18-24 hours</td>
<td>Days (death w/in 10-12 d (ingestion))</td>
<td>High</td>
<td>Stable</td>
</tr>
<tr>
<td>T-2 mycotoxins</td>
<td>No</td>
<td>2-4 hours</td>
<td>Days to months</td>
<td>Moderate</td>
<td>Years (at room temperature)</td>
</tr>
</tbody>
</table>

Source: Adapted from USAMRIID’s *Medical Management of Biological Casualties Handbook* (www.usamriid.army.mil).

### BIOLOGIC AGENT MATRIX

<table>
<thead>
<tr>
<th>Signs/Symptoms by System</th>
<th>Anthrax</th>
<th>Plague</th>
<th>Tularemia</th>
<th>Brucellosis</th>
<th>Q Fever</th>
<th>Bacterial Diarrhea</th>
<th>Smallpox</th>
<th>Viral Encephalitis</th>
<th>Viral Hemorrhagic Fever</th>
<th>Botulism</th>
<th>Enterotoxins</th>
<th>Ricin</th>
<th>Mycotoxins</th>
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<tbody>
<tr>
<td><strong>Respiratory</strong></td>
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<td>Nonproductive cough</td>
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<tr>
<td>Cough with bloody sputum</td>
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<td>Drowsiness</td>
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<td>Weakness/prostration</td>
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<tr>
<td>Progressive weakness of extremities</td>
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<td>Muscle rigidity</td>
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<tr>
<td>Flaccid paralysis, usually neck</td>
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<td><strong>General</strong></td>
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<td>Chills</td>
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<td>Fever</td>
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<td>Fatigue</td>
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<tr>
<td>Headaches</td>
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<tr>
<td>Sore throat</td>
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<td>Swollen lymph nodes</td>
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</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Disease</th>
<th>Signs &amp; Symptoms</th>
<th>Incubation Time</th>
<th>Person-to-person transmission</th>
<th>Isolation</th>
<th>Diagnosis</th>
<th>Postexposure Prophylaxis Adults</th>
<th>Treatment for Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax Bacillus anthracis</td>
<td>Flu-like symptoms (fever, fatigue, muscle aches, dyspnea, nonproductive cough, headache), chest pain; possible 1-2 day improvement then rapid respiratory failure and shock. Meningitis may develop.</td>
<td>1 to 6 days (up to 6 wks)</td>
<td>None</td>
<td>Standard Precautions</td>
<td>Chest x-ray evidence of widening mediastinum; obtain sputum and blood culture. Sensitivity and specificity of nasal swabs unknown – do not rely on for diagnosis.</td>
<td>Prophylaxis for 60 days: Ciprofloxacin* 500 mg PO q 12h or Doxycycline 100 mg PO q 12h AND Alternative (if strain susceptible and above contraindicated): Amoxicillin 500 mg PO q 8h. *In vitro studies suggest that Levofloxacin 500 mg PO q 24h or Gatifloxacin 400 mg PO q 24h or Moxifloxacin 400 mg PO q 24h could be substituted</td>
<td>Inhalation anthrax Combine IV/PO therapy for 60d Ciprofloxacin 500 mg q 12h or Doxycycline 100 mg q 12 h, AND 1 or 2 additional drugs (vancomycin, rifampin, imipenem clindamycin, chloramphenicol, clarithromycin, and if susceptible penicillin or ampicillin) Cutaneous anthrax Ciprofloxacin 500 mg PO q 12h or Doxycycline 100 mg PO 12h Recommendations same for pregnant women and immunocompromised persons</td>
</tr>
<tr>
<td>Anthrax Bacillus anthracis</td>
<td>Abdominal pain, nausea and vomiting, severe diarrhea, GI bleeding, and fever.</td>
<td>1 to 7 days</td>
<td>None</td>
<td>Standard Precautions</td>
<td>Culture blood and stool.</td>
<td>Recommendations same for pregnant women and immunocompromised persons</td>
<td></td>
</tr>
<tr>
<td>Botulism Botulinum toxin</td>
<td>Afebrile, excess mucus in throat, dysphagia, dry mouth &amp; throat, dizziness, then difficulty moving eyes, mild pupillary dilation, nystagmus, intermittent ptosis, indistinct speech, unsteady gait, extreme symmetric descending weakness, flaccid paralysis; generally normal mental status</td>
<td>Inhalation: 12-80 hours Foodborne: 12-72 hours (2-8 days)</td>
<td>None</td>
<td>Standard Precautions</td>
<td>Lab tests available from CDC or Public Health Dept; obtain serum, stool, gastric aspirate and suspect foods prior to giving antitoxin. Differential diagnosis includes polio, Guillain-Barré, myasthenia, tick paralysis, stroke, meningococcal meningitis</td>
<td>Pentavalent toxoid (types A,B,C,D,E) 0.5 ml SQ may be available as investigational product from USAMRIID</td>
<td>Botulism antitoxins from public health authorities. Supportive care and ventilatory support. Avoid clindamycin and aminoglycosides.</td>
</tr>
<tr>
<td>Pneumonic Plague Yersinia pestis</td>
<td>High fever, cough, hemoptysis, chest pain, N/V, HA. Advanced disease: purpuric skin lesions, copious watery or purulent sputum; resp failure in 1 to 6 days</td>
<td>2-3 days (2-6 days)</td>
<td>Yes, droplet aerosols</td>
<td>Droplet Precautions until 48 hrs of effective antibiotic therapy</td>
<td>A presumptive diagnosis may be made by Gram, Wayson or Wright stain of lymph node aspirates, sputum, or CSF with gram negative bacilli w/bipolar (safety pin) staining</td>
<td>Doxycycline 100 mg PO q 12h or Ciprofloxacin 500 mg PO q 12h</td>
<td>Streptomycin 1 gm IM q 12h; or Gentamicin 2mg/kg, then 1 to 1.7mg/kg IV q 8h Alternatives: Doxycycline 200mg PO load, then 100mg PO q 12h or Ciprofloxacin 400 mg IV q 12h</td>
</tr>
<tr>
<td>Smallpox</td>
<td>Prodromal period: malaise, fever, rigor, vomiting, HA &amp; backache. After 2-4 days, skin lesions appear &amp; progress uniformly from macules to papules to vesicles &amp; pustules, mostly on face, neck, palms, soles, &amp; subsequently to trunk</td>
<td>12-14 days (7-17 days)</td>
<td>Yes, airborne droplet or direct contact w/skin lesions or secretions until all scabs separate &amp; fall off (3 to 4 wks)</td>
<td>Airborne (includes N95 mask) and Contact Precautions</td>
<td>Swab culture of vesicular fluid or scab, send to BL-4 lab. All lesions similar in appearance and develop synchronously as opposed to chickenpox. Electron microscopy can differentiate variola virus from varicella.</td>
<td>Early vaccine critical (in 4 days). Call CDC for vaccine. Vaccine immune globulin in special cases – call ASAMRIID 301-619-2833</td>
<td>Supportive care. Previous vaccination against smallpox does not confer lifelong immunity. Potential role for Cidofovir</td>
</tr>
</tbody>
</table>
### CHEMICAL TERRORISM AGENTS AND SYNDROMES: In an emergency: Call Poison Control at 1-800-222-1222

<table>
<thead>
<tr>
<th>Agents</th>
<th>Signs</th>
<th>Symptoms</th>
<th>Onset</th>
<th>Clinical Diagnostic Tests</th>
<th>Exposure Route and Treatment</th>
<th>Differential diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nerve Agents:</strong> Sarin (GB); Tabun (GA); Soman (GD); Cyclohexyl Sarin (GF); VX; Novichok agents, other organophosphorus compounds: carbamates &amp; pesticides</td>
<td>SLUDGE</td>
<td>Hypersalivation (increased secretions) Laecritation (teary eyes) Urination; diarrhea GI cramping; emesis Pingoont pupil Bronchoconstriction Respiratory arrest</td>
<td>Moderate exposure: Diffuse muscle cramping, difficulty breathing, eye pain, dimming of vision, sweating, muscle tremors</td>
<td>Aerosols: Seconds to minutes Liquids: Minutes to hours</td>
<td>Inhalation and dermal absorption: Atropine (2mg) IV; q 5 min, titrate until effective; average dose 6 to &gt;15mg - Use IM in the field before IV access - Establish airway for oxygenation</td>
<td>Poisoning from organophosphate and carbamate pesticides may occur as a result of occupational exposure Myasthenia gravis</td>
</tr>
<tr>
<td>Cyanides: hydrogen cyanide (HCN) cyanogen chloride</td>
<td>Moderate exposure:</td>
<td>Metabolic acidosis, venous blood O₂ level &gt; normal, hypotension, &quot;pink&quot; skin</td>
<td>Moderate exposure:</td>
<td>Moderate exposure: Giddiness, palpitations, dizziness, N / V, HA, eye irritation, hyperventilation, drowsiness</td>
<td>Inhalation, ingestion, &amp; dermal absorption: O₃ by mask/ Eti Amyl nitrite inhalants q 1-5 min Sodium nitrite (300 mg IV over 5-10 min) &amp; sodium thiosulfate (12.5 g IV) Hydroxocobalamin 5 gm IV IVPB over 15 min. Repeat X 1 pm; max total dose 10 g</td>
<td>Similar CNS illness can result from: Industrial/occupational exposure to HCN &amp; derivatives; carbon monoxide exposure; hydrogen sulfide (H₂S) exposure from sewers, animal waste, industrial sources</td>
</tr>
<tr>
<td>Viscents/Blister Agents: sulfur mustard, lewisite, nitrogen mustard, mustard lewisite, phosgene-oxide</td>
<td>Moderate exposure:</td>
<td>Skin erythema and blistering; watery, swollen eyes; upper airways sloughing with pulmonary edema; metabolic failure, neutropenia &amp; sepsis (esp. sulfur mustard, late in course)</td>
<td>Moderate exposure:</td>
<td>Moderate exposure:</td>
<td>Inhalation and dermal absorption Mustards no antidote For lewisite and lewisite/mustard mixtures: British Anti-Lewisite (BAL or Dimercaprol) IM (rarely available) Thermal burn therapy; supportive care (respiratory support and eye care)</td>
<td>Poisoning from nerve agents</td>
</tr>
<tr>
<td>Pulmonary/Choking Agents: phosgene, diphosgene, chloropiric, oxides of nitrogen, sulfur dioxide</td>
<td>Pulmonary edema with some mucosal irritation (greater water solubility of agent = greater mucosal irritation) leading to ARDS or non-cardiogenic pulmonary edema Pulmonary infiltrate</td>
<td>Pulmonary edema with some mucosal irritation (greater water solubility of agent = greater mucosal irritation) leading to ARDS or non-cardiogenic pulmonary edema Pulmonary infiltrate</td>
<td>Pulmonary infiltrate</td>
<td>No tests available but Hx may help identify source &amp; exposure characteristics (majority of incidents exposing humans involve trucking with labels on vehicle)</td>
<td>Inhalation No antidote Management of secretions: O₃ therapy; consider high dose steroids to prevent pulmonary edema (demonstrated benefit only for oxides of nitrogen) Treat pulmonary edema with PEEP to maintain Po₂ above 60 mm Hg</td>
<td>Diffuse skin exposure with irritants, such as caustics, sodium hydroxides, ammonia, etc. may cause similar syndromes Sodium hydroxide (NaOH) from trucking accidents</td>
</tr>
<tr>
<td>Ricin (castor bean oil extract)</td>
<td>Clusters of acute lung or GI injury; circulatory collapse and shock, tracheobronchitis, pulmonary edema, necrotizing pneumonia</td>
<td>Ingestion: Nausea, diarrhea, vomiting, fever, abdominal pain Inhalation: chest tightness, coughing, weakness, nausea, fever</td>
<td>Ingestion: Nausea, diarrhea, vomiting, fever, abdominal pain Inhalation: chest tightness, coughing, weakness, nausea, fever</td>
<td>1-24 hours (rarely up to 72 hours); May be asymptomatic period of hours</td>
<td>Inhalation and Ingestion No antidote Support care For ingestion: charcoal lavage</td>
<td>Tularemia, plague, and Q fever may cause similar syndromes, as may biological weapons and chemical weapon agents such as Staphylococcocal enterotoxin B and phosgene</td>
</tr>
<tr>
<td>T-2 myotoxins; Flusarum, Myrothecium, Trichoderma, Verticimonosporium, Stachybotrys</td>
<td>Mucosal erythema and hemorrhage (intestinal necrosis) Red skin, blistering Increased salivation Pulmonary edema Seizures and coma Liver/renal dysfunction</td>
<td>Dermal and mucosal irritation; blistering, necrosis Blurred vision, eye irritation, tearing Nausea, vomiting, and diarrhea Ataxia, coughing and dyspnea</td>
<td>Dermal and mucosal irritation; blistering, necrosis Blurred vision, eye irritation, tearing Nausea, vomiting, and diarrhea Ataxia, coughing and dyspnea</td>
<td>2-4 hours</td>
<td>Inhalation and dermal contract No antidote Supportive care For ingestion: charcoal lavage Consider high dose steroids</td>
<td>Pulmonary toxins (O₃, NO₂, phosgene, NH₃) may cause similar syndromes though with less mucosal irritation.</td>
</tr>
</tbody>
</table>

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**Resources:**

- [Gas chromatography/Mass spectrometry in specialized laboratories](https://www.usamricd.army.mil)
Intentionally left blank
### Hospital designations for specialty transport situations

<table>
<thead>
<tr>
<th>Region 9 Hospitals</th>
<th>Location</th>
<th>EMS designation</th>
<th>STEMI Center</th>
<th>Trauma Center</th>
<th>Stroke Center</th>
<th>EDAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocate Good Shepherd</td>
<td>450 W Highway 22, Barrington</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Advocate Lutheran General</td>
<td>1775 W Dempster, Park Ridge</td>
<td>Resource</td>
<td>Yes</td>
<td>1; replantation</td>
<td>Comprehensive</td>
<td>PCCC</td>
</tr>
<tr>
<td>Advocate Sherman</td>
<td>1425 N Randall Road, Elgin</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita Alexian Brothers</td>
<td>800 Biesterfield Road, Elk Grove</td>
<td>Associate</td>
<td>Yes</td>
<td>2; replant hands</td>
<td>Comprehensive</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita Glen Oaks)</td>
<td>701 Winthrop, Glendale Hts</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita Mercy Med Center</td>
<td>1325 N Highland Ave, Aurora</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita Resurrection</td>
<td>7435 W. Talcott, Chicago</td>
<td>Associate</td>
<td>Yes</td>
<td>No</td>
<td>Comprehensive</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita Saint Joseph</td>
<td>77 N Airlite, Elgin</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita St. Alexius</td>
<td>1555 Barrington Rd, Hoffman Est</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>NM Huntley</td>
<td>10400 Haligus Rd, Huntley</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Pending</td>
</tr>
<tr>
<td>NM McHenry</td>
<td>4201 Medical Circle Dr, McHenry</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>NM Woodstock</td>
<td>3701 Doty Rd, Woodstock</td>
<td>Associate</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>NM Delnor</td>
<td>300 Randall Rd., Geneva</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Northwest Community (NCH)</td>
<td>800 W. Central, Arlington Hts.</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Comprehensive</td>
<td>Yes</td>
</tr>
<tr>
<td>Rush Copley Med Center</td>
<td>2000 Ogden Ave, Aurora</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region 8 Hospitals</th>
<th>Location</th>
<th>EMS designation</th>
<th>STEMI Center</th>
<th>Trauma Center</th>
<th>Stroke Center</th>
<th>EDAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amita Bolingbrook</td>
<td>500 Remington Blvd, Bolingbrook</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>NM Central DuPage</td>
<td>25 N. Winfield Rd, Winfield</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Comprehensive</td>
<td>PCCC</td>
</tr>
<tr>
<td>Edward Hospital</td>
<td>801 S Washington St, Naperville</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Comprehensive</td>
<td>PCCC</td>
</tr>
<tr>
<td>Elmhurst Hospital</td>
<td>York &amp; Roosevelt Rd, Elmhurst</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Advocate Good Samaritan</td>
<td>3815 Highland, Downers Grove</td>
<td>Resource</td>
<td>Yes</td>
<td>1 (adults)</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Gottlieb Memorial</td>
<td>675 W. North Ave, Melrose Park</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Stroke ready</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita Hinsdale Hospital</td>
<td>120 N Oak St, Hinsdale</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Amita LaGrange Memorial</td>
<td>5101 S. Willow Springs, LaGrange</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Loyola Medical Center</td>
<td>2160 S. 1st Ave., Maywood</td>
<td>Resource</td>
<td>Yes</td>
<td>1; burn center</td>
<td>Comprehensive</td>
<td>PCCC</td>
</tr>
<tr>
<td>MacNeal Hospital</td>
<td>3249 S Oak Park Ave, Berwyn</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Rush Oak Park Hospital</td>
<td>520 S Maple Ave, Oak Park</td>
<td>Associate</td>
<td>Yes</td>
<td>No</td>
<td>Primary</td>
<td>No</td>
</tr>
<tr>
<td>Westlake Hospital</td>
<td>1225 W Lake St., Melrose Park</td>
<td>Associate</td>
<td>No</td>
<td>No</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>West Suburban</td>
<td>3 Erie St, Oak Park</td>
<td>Associate</td>
<td>Yes</td>
<td>No</td>
<td>Primary</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region 10 Hospitals</th>
<th>Location</th>
<th>EMS designation</th>
<th>STEMI Center</th>
<th>Trauma Center</th>
<th>Stroke Center</th>
<th>EDAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condell (Advocate)</td>
<td>801 S. Milwaukee Ave, Libertyville</td>
<td>Resource</td>
<td>Yes</td>
<td>1 (adults)</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Northshore Evanston</td>
<td>2650 Ridge Ave, Evanston</td>
<td>Associate</td>
<td>Yes</td>
<td>1</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Northshore Glenbrook</td>
<td>2100 Pfingston, Glenview</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Northshore Highland Park</td>
<td>777 Park Ave. West, Highland Park</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Northshore Skokie</td>
<td>9600 Gross Point Road, Skokie</td>
<td>Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>NM Lake Forest</td>
<td>660 N Westmoreland, Lake Forest</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>St. Francis (Amita)</td>
<td>355 Ridge Ave; Evanston</td>
<td>Resource</td>
<td>Yes</td>
<td>1</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>Vista Med Center East</td>
<td>1324 N Sheridan Rd, Waukegan</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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: Good Samaritan; Lutheran General; SAMC: Loyola; NW Community; Central DuPage; Rush Copley
Hospitals with NO OB Services: Amita St. Joseph Hospital (Elgin); Glenbrook hospital
### Wong-Baker FACES Pain Rating Scale

![Wong-Baker FACES Pain Rating Scale](image)

<table>
<thead>
<tr>
<th>No pain</th>
<th>Mild pain (1-3)</th>
<th>Moderate pain (4-6)</th>
<th>Severe pain (7-10)</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sin dolor</td>
<td>Dolor leve</td>
<td>Dolor moderado</td>
<td>Dolor agudo</td>
<td>Spanish</td>
</tr>
<tr>
<td>Bez bolova</td>
<td>Umjereni bolovi</td>
<td>Najgori bolovi</td>
<td>Bosnian</td>
<td></td>
</tr>
<tr>
<td>Schmerzfrei</td>
<td>Ertagbarer schmerz</td>
<td>Unvollställbarer schmerz</td>
<td>German</td>
<td></td>
</tr>
<tr>
<td>Tsis mob</td>
<td>Mob hau sim</td>
<td>Mob heev</td>
<td>Hmong</td>
<td></td>
</tr>
<tr>
<td>No dolore</td>
<td>Dolore moderato</td>
<td>Dolore fortissimo</td>
<td>Italian</td>
<td></td>
</tr>
<tr>
<td>Nie bôlu</td>
<td>Umiarkowany</td>
<td>Bardzo mocny bôıl</td>
<td>Polish</td>
<td></td>
</tr>
<tr>
<td>Не болит</td>
<td>Умеренная боль</td>
<td>Едва переносимая боль</td>
<td>Russian</td>
<td></td>
</tr>
<tr>
<td>Không có đau</td>
<td>Hói dau</td>
<td>Không có dau cho lam</td>
<td>Rát dau</td>
<td>Vietnamese</td>
</tr>
</tbody>
</table>

### FLACC Pain Scale - Children 2 mos to 7 yrs or unable to communicate their pain.

<table>
<thead>
<tr>
<th>Score</th>
<th>Category</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>No particular expression or smile</td>
<td>Occasional grimace or frown, withdrawn, disinterested</td>
<td>Frequent to constant quivering chin, clenched jaw</td>
<td></td>
</tr>
<tr>
<td>Legs</td>
<td>Normal position or relaxed</td>
<td>Uneasy, restless, tense</td>
<td>Kicking or legs drawn up</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Lying quietly, moves easily</td>
<td>Squirming, shifting back &amp; forth, tense</td>
<td>Ached, rigid, or jerking</td>
<td></td>
</tr>
<tr>
<td>Cry</td>
<td>No cry (awake or asleep)</td>
<td>Moans or whispers, occasional complaint</td>
<td>Crying steadily, screams or sobs, frequent complaints</td>
<td></td>
</tr>
<tr>
<td>Consolability</td>
<td>Content, relaxed</td>
<td>Reassured by occasional touching, hugging or being talked to, distractible</td>
<td>Difficult to console or comfort</td>
<td></td>
</tr>
</tbody>
</table>

**Merkel, S.I. et al. (1997), The FLACC: A behavioral scale for scoring postoperative pain in young children. Pediatric Nrs, 23(3), 293-297.**

### Abbey Pain Scale

Use to assess pain in people with dementia who cannot verbalize.

<table>
<thead>
<tr>
<th>Score</th>
<th>Vocalization: Whimpering, moaning, groaning, crying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>Looking tense, frowning, grimacing, looking frightened</td>
</tr>
<tr>
<td>Legs</td>
<td>Fidgeting, rocking, guarding part of body, withdrawn</td>
</tr>
<tr>
<td>Activity</td>
<td>↑ confusion, combative, refusing to eat, alteration in usual patterns, difficulty sleeping, increased wandering, decreased social interactions</td>
</tr>
<tr>
<td>Physiological change: T, P, or BP outside normal limits, perspiring, flushing or pallor</td>
<td></td>
</tr>
<tr>
<td>Physical changes: Skin tears, pressure areas, arthritis, contractures</td>
<td></td>
</tr>
<tr>
<td>Interpretation: 0-2 No pain</td>
<td>3-7 Mild</td>
</tr>
</tbody>
</table>

**Assess if pain is acute; chronic; or acute on chronic for this patient**