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, Presence Saint Joseph, 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.
# GENERAL PATIENT MANAGEMENT

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Assumptions

1. All EMS personnel will function within their scope of practice as defined by the Illinois EMS Act, IDPH Rules and Regulations, Illinois Dept of Financial and Professional Regulation, and practice privileges authorized by the EMS MD of the System in which they are working.

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

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

4. Levels of acuity: Definitions match Model of Clinical Practice of Emergency Medicine; in the Ntl EMS Core Content: Acuity level is essential for identifying care priorities in EMS setting. They are coded to NEMSIS standards and should be documented as such in the PCR/EHR. CRITICAL pts are TIME-SENSITIVE with black box notations in the SOPs. CRITICAL: Symptoms of a life threatening illness or injury with a high probability of mortality if immediate intervention is not begun to prevent further airway, respiratory, hemodynamic and/or neurologic instability. EMERGENT: Symptoms of illness or injury may progress in severity or result in complications w/ a high probability for morbidity if treatment is not begun quickly. These may be identified as time-sensitive on a case by case basis.

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

Guidelines

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

2. Bus Accident: Refer to Region policy.

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

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

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

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

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

8. Treatment of prisoners: Prisoners should be transported under the custody of a law enforcement officer for a medical screening exam at the officer's request. The officer should accompany the prisoner in the ambulance. Note the officer's name and badge number on the PCR/EHR. EMS personnel are not responsible for the secured custody of prisoners. If a prisoner has been placed in handcuffs, the officer is still responsible for the prisoner. If the officer does not accompany the patient in the ambulance, he or she must follow the ambulance in their vehicle during EMS transport but EMS personnel must be given the handcuff key.

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

10. Selection of receiving healthcare facility: See Initial Medical and Initial Trauma Care and local System policies.
<table>
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<th>See local policies/procedures for details</th>
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<td>• Diphenhydramine PO /IM</td>
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<td>• Epinephrine (1mg/1mL) IM from ampule or vial</td>
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<tr>
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<tr>
<td>• Naloxone IN &amp; IM</td>
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<tr>
<td>• Ondansetron ODT</td>
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<td></td>
<td></td>
<td>• Tetracaine ophthalmic solution</td>
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<td>• Vaccinations in approved program</td>
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</table>
Assessments and initial interventions shall be performed on all pts at the point of contact unless it is unsafe, as circumstances allow, and the pt. consents. Monitoring & intervention equipment/devices for EMS personnel to function to their level of licensure, in accordance with the level of service at which the EMS vehicle is operating must be brought to the pt. so complete information is obtained that will allow treatment at the appropriate level of care without delay. Perform resuscitative interventions during the primary assessment as impairments are found.

Care should progress from BLS to ALS as required by pt. condition, practitioner scope of practice, level of service, and local policy/procedure. Secure all EMS equipment and ensure appropriate restraint systems are used by all ambulance occupants during transport.

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

2. **PRIMARY ASSESSMENT:** establish rapport with patient/significant others
   - General impression: age, gender, general appearance, position, purposeful movements
   - Determine if immediate life threat exists and resuscitate as found
   - Level of consciousness using AVPU or GCS; chief complaint S&S
     - If unconscious, apneic or gasping, & pulseless START QUALITY CPR – see appendix
   - AIRWAY: snoring, gurgling, stridor, silence; consider possible spine injury
     - Open/maintain using position, suction, and appropriate adjuncts
     - If Obstructed: Go to AIRWAY OBSTRUCTION SOP
     - Loosen tight clothing; vomiting and seizure precautions as indicated
   - BREATHING/gas exchange/adequacy of ventilations: Assess/intervene as needed:
     - Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing)
     - Position, adequacy of air movement, symmetry of chest expansion; accessory muscle use; retractions
     - Lung sounds if in ventilatory distress
     - 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%-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:** Per appropriate SOP
     - 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 quality CPR.
     - Perfusion: Mental status (central); skin: color, temperature, moisture; turgor (peripheral)
     - Identify type, volume, & source(s) of external bleeding; control hemorrhage (See ITC p. 39)
     - ECG: (rhythm/12 L) based on chief complaint or PMH: pain/discomfort nose to navel, SOB/HF, weak/tired/ fatigued, dizziness/syncope, c/o nausea, indigestion, palpitations/dysrhythmia, diaphoresis, etc.
       - See notes in ACS SOP re: 12 L ECG.
       - ALS patients do not necessarily require ongoing ECG monitoring or transmission of a strip to OLMC.
       - If ECG is run, attach/append to PCR/EHR left at, faxed to, or downloaded to, the receiving facility.
     - Treat rate/rhythm/pump/volume/volume distribution disorders per appropriate SOP
     - Vascular access: Indicated for actual/potential volume replacement and/or IV meds prior to hospital arrival
       - **0.9% NS** – Catheter size, access site, & infusion rate based on pt size, hemodynamic status; SOP or OLMC
       - Do not delay transport of time-sensitive pts to establish elective vascular access on scene
3. **SECONDARY ASSESSMENT:** History and physical exam – tailor to pt presentation & chief complaint

- **Chief complaint; history of present illness; SAMPLE history**
  - S&S: OPQRST (symptom onset, provocation/palliation, quality, region/recurrent/radiation, severity, time); quantify pain using an appropriate pain scale that is consistent with the pt's age, condition, and ability to understand.
  - Allergies (meds, environment, foods), Medications (prescription/over-the-counter – bring containers to hospital if possible), PMH (medic-alert jewelry; advance directives; medical devices/implants); Last oral intake/LMP
  - Events leading to illness. In pts with syncope, seizure, AMS, cardiac arrest, or acute stroke, consider bringing witness to hospital or obtain their contact/call back phone number to provide to ED.

- **Review of systems** based on chief complaint; S&S; practitioner scope of practice, and patient level of acuity
  - Head: eyes, ears, nose, throat/neck; jugular venous distention
  - Chest: Symmetry, chest wall movement; deformity, retractions; lung/heart sounds
  - Abdomen/pelvis/GU/reproductive organs: Inspect contour, symmetry; discoloration; pain; changes in function; auscultate bowel sounds; palpate (light); assess for rebound tenderness if S&S peritonitis
  - 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

5. **Nausea:** ONDANSETRON 4 mg oral dissolve tablet [BLS] or slow IVP over no less than 30 sec [ALS]

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

   **NITROUS OXIDE if available**
   - 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).
   - Elderly (≥ 65) / debilitated: 0.5 mcg/kg (max single dose 50 mcg) IVP/IN/IM/IO.
   - Additional doses require OLMC: 0.5 mcg/kg q. 5 min up to a total of 3 mcg/kg (300 mcg) if indicated & available

7. **Ongoing assessment:** Reassess VS/pt. responses. Every transported pt. should have at least 2 sets of VS.

   **Stable:** At least q. 15 min & after each drug/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility.
   **Unstable:** More frequent reassessments; continue to reassess all abnormal VS & physical findings

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

Note: A patient's condition or behavior may require routinely performed IMC to be waived or deferred. This decision is made jointly by OLMC and EMS. Document situation and patient's condition or behaviors necessitating a change in usual and customary assessment/care.
Purpose: To provide alternative treatment for serious emergencies when the primary medications are unavailable due to drug supply shortages.

**PAIN management:** Consider patient status, responder scope of practice, risks/benefits of each strategy. Provide individualized pain mgmt regardless of transport interval. **Goal:** Pain is relieved and/or tolerable or all pain relieving options have been exhausted, pain medications are contraindicated (SBP < 90 or MAP < 65), or patient refuses the medication. Assess and document response to interventions/medications including reassessment of VS within 5 min after each intervention. This protocol excludes pts who are allergic to narcotics and/or who have AMS (GCS < 15 or mentation not appropriate for age).

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

**Alternative for pain if no fentanyl or morphine:**

**KETAMINE:** See dose charts in appendix  Adult p. 104;  Peds p. 103

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

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

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

Peds  0.3 mg/kg IVP/IO (max 10 mg) or 0.5 mg/kg IR (max 20 mg)

**Norepinephrine – Alternative to Dopamine** as a vasopressor

**Alpha (α) dose:** NOREPINEPHRINE Initial dose: 8 mcg/min (2 mL/min), adjust upwards in 2 mcg/min (0.5 mL/min) increments to max of 20 mcg/min to reach SBP ≥ 90 (MAP ≥ 65). Retake BP every 2 min from time drug is started until desired BP is reached, then every 5 min. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min).
### On-line Medical Control (OLMC)/Handover REPORTS

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

### GENERAL FORMAT

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

Call update report directly to receiving facility if different from OLMC if changes occur prior to arrival & if time permits. An EMS “time-out” to allow for an uninterrupted **handover report** after hospital arrival is useful in ensuring continuity of care especially if a complete written/electronic ePCRs/EHRs are not left/downloaded at the time of pt handoff (ACS, 2014).

### ABBREVIATED REPORT

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

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

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

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

ADVANCE DIRECTIVES

<table>
<thead>
<tr>
<th>IDPH POLST form</th>
<th>&quot;Practitioner Orders for Life-Sustaining Treatment&quot;; 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 described 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 thorough the use of medications by EMS-approved routes as needed: use oxygen, suction, manual treatment of airway obstruction. Do not use treatments listed in Full and Selected Treatment unless consistent with comfort goal. Transfer to hospital only if comfort needs cannot be met in current location.

5. **COMPONENTS OF A VALID POLST form/DNR Order**: Region IX recognizes an appropriately executed IDPH POLST form and/or any other written document that has not been revoked; containing at least the following elements:
   - Patient name
   - Resuscitation orders (Section “A”)
   - Date
   - 3 Signatures
   - Patient or Legal Representative signature
   - Witness signature
   - Authorized practitioner name & signature
   - Physician, licensed resident (2nd yr or higher), APN, PA
   - All other information is optional

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
- Mumification/putrefaction
- Incineration
- Frozen state
- Trauma where CPR is impossible

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

Power of Attorney for Healthcare (POA)/ Living Wills

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

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

Hospice patients not in cardiac/respiratory arrest

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

Termination of Resuscitation (TOR)

A physician’s order is required to stop resuscitation

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

- Aging reflects natural loss of function and reserve capacity as one gets older.
  Everyone ages differently at different rates – can look older or younger than chronological age - evaluate individually
- Frail elderly may have impairments with mobility, nutrition, disability, and/or cognition; evaluate for possible abuse/neglect
- Advanced age alone is NOT predictive of poor outcomes & should NOT be used as sole criterion for denying/limiting care
- Physiologic responses may differ from those in younger pts due to changes assoc. w/ aging + comorbidities
- Elderly pts can experience significant injury despite a relatively minor mechanism.
  If at least 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, or ventilation w/ BVM if O₂ via NC or NRM is ineffective
   - Blunt thoracic trauma: higher risk for rib fx due to bone brittleness. Pain control titrated to ventilations.
   - If chronic hypercarbic state (COPD): Manage ventilatory failure w/ acute resp. acidosis carefully.
     Slowly eliminate only extra 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, thus normal BP may reflect hypotension. Concern: HR > 90; SBP < 110 in trauma pts.
   Anticipate ACS/Silent Mls; side effects of meds; hypovolemia/dehydration; pneumonia; UTI/acute renal failure; stroke, syncope; GI, glucose emerg;
   sepsis/septic shock. Identify cause/correct hypotension/shock/acidosis. May appear “stable” yet have perfusion deficit due to low cardiac output.
   Need to ↑ perfusion to brain & coronary arteries if hypotensive: IV NS up to 1 L: Do not volume overload
   Monitor mental status, 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 may be due to dementia or delirium, leading to late recognition of hypoxia, hypoglycemia, hypothermia, shock, stroke, or TBI. Assess pt's baseline and time of onset of acute alterations from their normal.
   Neuro exam can be unreliable for detecting S&S intracranial hemorrhage. KEEP WARM!

4. PMH; ask about medications/compliance: Polypharmacy poses special risks; see drugs p. 22.
   - Beta blockers, ACEI, ARBs, Ca blockers, dig may impair ability to compensate for hypoperfusion & hypotension
   - Anticoagulants can increased systemic or intracranial hemorrhage; notify OLMC ASAP
   - Benzodiazepine, alcohol. & opioid prescription abuse common; monitor mental/ventilatory status carefully

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

6. Handle gently: Bone density losses predispose to fx. Do not log roll. Use sheets or scoop stretcher to lift and move to board/stretch.
   Carefully assess and provide selective spine precautions for falls
   If placed on spine board: Pad well, protect bony prominences. Inform ED re elderly pt on board.

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

8. All refusals must have OLMC contact from scene prior to releasing the patient per System policy/procedure.

<table>
<thead>
<tr>
<th>PHYSIOLOGIC CHANGES IN THE ELDERLY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Circulatory</strong></td>
</tr>
<tr>
<td>↓ 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 &amp; unreliable sign of hemorrhage.</td>
</tr>
<tr>
<td><strong>Cardiac</strong></td>
</tr>
<tr>
<td>↑ 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.</td>
</tr>
<tr>
<td><strong>Pulmonary</strong></td>
</tr>
<tr>
<td>Stiffer chest wall: ↓ total lung capacity, ↓ lung elastic recoil. Weaker muscles cause less efficient inhalation. Gas diffusion diminishes d/t loss of alveolar-capillary membrane surface area thus reducing pO₂ but no changes in pCO₂ if healthy. Impaired ventilatory effort related to inadequate pain relief. Decreased gag and cough reflexes. Pneumonia/pulm contusion risk.</td>
</tr>
<tr>
<td><strong>Renal</strong></td>
</tr>
<tr>
<td>Fewer cortical nephrons, ↓ renal function; impairs metabolism and excretion of meds</td>
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<tr>
<td><strong>Nervous</strong></td>
</tr>
<tr>
<td>↓ brain mass; eye disease; ↓ depth perception; ↓ pupillary response; ↓ hearing &amp; sense of smell; ↓ responsivenes to ANS &amp; β agonists, ↓ pain perception. Prone to subdural hematomas; brain atrophy may delay S&amp;S; high c-spine inj (C-2 fx) most common; Central cord syndrome more freq d/t hyperextension; nerve damage – peripheral neuropathy.</td>
</tr>
</tbody>
</table>
EXTREMELY OBESE PATIENTS

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

1. **IMC/ITC special considerations:**
   - **Positioning:** Consider risk for apnea, airway obstruction, ventilatory distress, and desaturation when flat. Elevate head of stretcher 30°-45°; use padding to achieve sniffing position, or sit patient up as tolerated.
   - **Airway Management Considerations:**
     - Insert alternate advanced airway; effectively secure airway. Higher incidence of tube dislodgement;
     - BVM with 2 person technique may be most effective in managing effective ventilations
   - **Breathing:** Assessment of lung sounds may be difficult; listen over back first
     - SpO₂ monitoring: Can desaturate more quickly and be more difficult to monitor
     - Consider use of earlobe (central) sensor to better detect perfusion; - expect SpO₂ of 88% – 92% on 6 L O₂/NRM
     - O₂ by NRM or CPAP (PEEP 5 – 10 cm H₂O); assist w/ BVM (2 person technique) if hypoxia or hypercarbia persists
     - CO₂ retention probable (46-52 mEq/L); monitor capnography if available
     - If ventilated: give V₁ 8 – 10 mL/kg – use V₁ of ideal body weight
   - **Flail chest:** Difficult to diagnose clinically; palpate chest wall; CPAP trial if no pneumothorax; intubate/ventilate if respiratory failure
   - **Tension pneumothorax:** Needle pleural decompression per system procedure
   - **Circulation:**
     - Fluid loading is poorly tolerated
     - Standard lg bore IV approaches may be difficult d/t thickness of sub-q fat and relatively short catheters
     - IO alternate sites per System policy: proximal humerus and distal tibia; 45 mm 15 g needle if available
     - ECG: Changes due to obesity: decreased amplitude (leads farther from heart); flattening of T waves in leads II, III, AVF, V5, V6, & T wave flattening or inversion in I and AVL
   - **Disability:**
     - Supine patients will have decreased range of motion
     - Motor strength may be diminished & difficult to assess due to weight of extremities; look for symmetry
     - May have deceptive pain perception
   - **Exposure:**
     - Pannus (abd skin), back, buttocks, and perineum may be difficult to examine; addl. personnel may be needed
     - View as much skin as possible; lift and retract pannus to inspect for wounds, skin ulcers; infections

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

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

4. **Transport considerations:** Stretcher/spine board weight limits. Request a bariatric-equipped vehicle if available.

### Anatomic and Physiologic Changes

<table>
<thead>
<tr>
<th>Pulmonary</th>
<th>Cardiovascular</th>
<th>Musculoskeletal</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>
<td>Limited mouth opening capacity; short neck with limited mobility</td>
</tr>
<tr>
<td>↑ Chest wall resistance</td>
<td>↑ stroke volume and stroke work index in proportion to body wt</td>
<td>↓ ROM; osteoarthritis, chronic pain</td>
</tr>
<tr>
<td>↑ Airway soft tissue/resistance</td>
<td>↑ cardiac output and metabolic demand</td>
<td></td>
</tr>
<tr>
<td>Abnormal diaphragmatic position</td>
<td>↑ LV volume, which can lead to dilatation and hypertrophy</td>
<td></td>
</tr>
<tr>
<td>↓ Diameter of trachea</td>
<td>Atherosclerosis</td>
<td></td>
</tr>
<tr>
<td>↓ Reserve volumes</td>
<td>↓ myocardial compliance up to 35% of normal</td>
<td></td>
</tr>
<tr>
<td>↑ O₂ consumption &amp; CO₂ production</td>
<td>HTN augments pathophysiologic cardiac changes</td>
<td></td>
</tr>
<tr>
<td>Obesity hypoventilation syndrome</td>
<td>Obesity cardiomyopathy syndrome; HF w/ pronounced hemodynamic changes</td>
<td></td>
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<tr>
<td>GI</td>
<td></td>
<td></td>
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<tr>
<td>↑ intraabdominal pressure</td>
<td></td>
<td></td>
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<tr>
<td>↑ volume of gastric fluid</td>
<td></td>
<td></td>
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<tr>
<td>↑ incidence of GERD and hiatal hernia</td>
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</tr>
</tbody>
</table>

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AIRWAY OBSTRUCTION

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

CONSCIOUS

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

CANNOT SPEAK or COUGH:
2. 5 abdominal thrusts (Heimlich maneuver) with victim standing or sitting.
   If pregnant > 3 months or morbidly obese: 5 chest thrusts.

REPEAT IF NO RESPONSE:
3. If successful: complete Initial Medical Care and transport
4. If still obstructed: Continue step #2 while enroute until foreign body expelled or patient becomes unconscious.
   (See below)

UNCONSCIOUS

Note: Any time efforts to clear the airway are successful complete Initial Medical Care
2. If no effective breathing: Attempt to ventilate. If obstructed: reposition head, reattempt to ventilate.
3. If unsuccessful: Begin CPR.
   - Look into mouth when opening the airway to begin CPR.
   - Use finger sweep to remove visible foreign body.

ALS
4. As soon as equipment is available:
   Visualize airway w/laryngoscope and attempt to clear using forceps or suction.
5. If still obstructed and unable to intubate or ventilate adequately:
   - Transport; attempt to ventilate with 15 L O₂/BVM
DRUG-ASSISTED INTUBATION (DAI)
Expanded Scope Practice (NR)

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

**Consider indications for DAI:**
- Actual or potential airway impairment or aspiration risk (trauma, stroke, AMS)
- Actual/ impending ventilatory failure (HF, pulmonary edema, COPD, asthma, anaphylaxis; shallow/labored effort; \( \text{SpO}_2 \leq 90; \text{ETCO}_2 \geq 60 \))
- Increased WOB (retractions, use of accessory muscles) resulting in severe fatigue
- GCS 8 or less due to an acute condition unlikely to be self-limited (Ex. self-limited conditions: seizures, hypoglycemia, postictal state, certain drug overdoses or traumatic brain injuries)
- Inability to ventilate/oxygenate adequately after inserting an OPA/NPA and/or via BVM
- Need for ↑ inspiratory or positive end expiratory pressures to maintain gas exchange
- Need for sedation to control ventilations

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

1. **IMC:** \( \text{SpO}_2 \), evaluate before and after airway intervention; confirm patent IV/IO; ECG monitor
2. **Prepare patient:**
   - **Position** supine in sniffing position (earlobe horizontal w/ xiphoid) if not contraindicated
   - Assess for signs suggesting a difficult intubation
3. **Preoxygenate for 3 minutes**
   - Breathing at RR 8 or greater: \( O_2 12-15 \text{ L/NRM} \) to avoid gastric distention
   - RR < 8 or shallow: \( O_2 15 \text{ L/BVM} \) at 10 BPM (asthma: 6-8)
4. **Prepare equipment:** BSI, suction source (attach rigid tip catheter); drugs & airway equipment (bougie)
5. **Premedicate** while preoxygenating
   - Gag reflex present: **BENZOCAINE** 1-2 second spray, 30 seconds apart X 2 to posterior pharynx
     May need to wait until after & etomidate given if teeth clenched
   - Pain mgt if needed: Fentanyl standard dose per IMC
6. **Sedation**
   - **ETOMIDATE** 0.5 mg/kg IVP up to local max dose per procedure **OR**
   - **KETAMINE** (preferred for Asthma) 2 mg/kg slow IVP (over one min) or 4 mg/kg IM
   - Allow for clinical response before intubating (if possible)
7. **Intubate per procedure:** **Maintain** \( O_2 6 \) L/NMC during procedure
   - Apply lip retraction, external laryngeal pressure; in-line stabilization if indicated
   - Monitor VS, level of consciousness, skin color, ETCO\(_2\) (if available), \( \text{SpO}_2 \) q. 5 min. during procedure
   - Assist ventilations at 10 BPM if \( \downarrow \) RR or depth, or \( \downarrow \) BP & hypoxic
8. **Confirm tube placement**
   - Monitor ETCO\(_2\) (quantitative waveform capnography preferred)
   - Ventilate and observe chest rise; auscultate over epigastrium, bilateral anterior chest, and midaxillary lines
   - If ETCO\(_2\) not detected, confirm position with direct laryngoscopy
9. **If successful**
   - \( O_2 15 \text{ L/BVM} \) at 10 BPM (asthma 6-8)
   - Inflate cuff (avoid overinflation); note diamond number on ETT level with teeth or gums (3 X ID ETT)
   - Secure ETT with commercial device. Reassess ETCO\(_2\) & lung sounds. Apply lateral head immobilization.
   - Post-intubation sedation: If \( \text{SBP} \geq 90 \) (MAP≥ 65): **MIDAZOLAM** 2 mg slow IVP/IN increments q. 2 min to 20 mg prn
   - Continue to monitor ETCO\(_2\) or capnography to confirm tracheal placement.
10. **If unsuccessful:** Reoxygenate X 30 sec; repeat steps 7 & 8. Consider need for additional medication.
    If unsuccessful (max 2 attempts) or ETI attempts not advised: insert **alternate airway**; ventilate with \( O_2 15 \text{ BVM} \)
11. **If unable to adequately ventilate:** Needles or **surgical cricothyrotomy** per System procedure.
ALLERGIC Reactions / ANAPHYLACTIC Shock

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

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

2. Observe for progression and transport

LOWER ACUITY: Mild SYSTEMIC Reaction SBP ≥ 90 (MAP ≥ 65)
S&S: Peripheral tingling, warmth, fullness in mouth and throat, nasal congestion, periorbital swelling, rash, itching, tearing, and sneezing

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

EMERGENT: Moderate SYSTEMIC Reaction SBP ≥ 90 (MAP ≥ 65)
S&S: Above PLUS bronchospasm, dyspnea, wheezing, edema of airways, larynx, or soft tissues; cough, flushing, N&V, warmth, or anxiety

2. EPINEPHRINE (1mg/1mL) 0.3 mg (mL) IM (vastus lateralis muscle) [BLS]
   - Caution: P > 100, CVD/HTN; on beta blockers, digoxin, MAO inhibitors; or pregnant
   - May repeat in 5-10 minutes: DO NOT DELAY TRANSPORT waiting for a response

3. DIPHENHYDRAMINE 50 mg IVP [ALS]; if no IV give IM [BLS]
4. If wheezing: ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg via HHN/mask. Add O2 6 L/NC if SpO2 <94% [BLS]

CRITICAL: Severe SYSTEMIC Reaction/ANAPHYLACTIC Shock SBP <90
Likely allergy; 2 or more of the following occurring rapidly after exposure:
- Skin signs: Itching, flushing, hives, swelling/edema
- Respiratory compromise: Severe dyspnea, hypoxia, decreased/absent lung sounds, wheeze, stridor, hoarseness
- Cardiovascular collapse: HYPOTENSION; dysrhythmias; syncope, or coma
Others: GI edema (dysphagia, intense abdominal cramping/pain, diarrhea, vomiting)

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

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

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

If cardiac arrest occurs – Begin quality CPR; Prolonged CPR indicated while S&S of anaphylaxis resolve
   - Start 2nd vascular access line; give IVF as rapidly as possible (up to 8 L) (use pressure infusers if available)
   - EPINEPHRINE (1mg/10mL) 1 mg IVP/IO q. 2 minutes (high dose); treat dysrhythmias per appropriate SOP

Life-threatening
Time sensitive
pt
### ASTHMA/COPD with Respiratory Distress

#### 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/pulmonary edema. See appendix for differential. If **probable cardiac cause** (PMH: CVD): Rx per Cardiac SOPs.
- Assess for pneumonia, atelectasis, pneumothorax or tension pneumothorax.
- **If tension pneumothorax** (↓ BP, unilaterally absent lung sounds): Needle pleural decompress affected side.
- **Airway/Oxygen:** Assess need for airway support, 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 an advanced airway is in place 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)
- **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.

##### History of ASTHMA
3. **EPINEPHRINE** (1mg/1mL) 0.3 mg IM BLS
   - Caution: HR > 100, CVD/HTN; on beta blockers, digoxin, or MAO inhibitors; pregnant; or significant side effects to albuterol
   - **Begin transport as soon as Epi is given.** Do not wait for a response.
   - May repeat X 1 in 10 min if minimal response
   - 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.

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

4. **If severe distress persists:**
   - **MAGNESIUM** (50%) 2 Gm in 16 mL NS (slow IVP/IO) or 40 mL NS IVPB over 5-10 min. Max 1 Gm / minute.
Pts w/ TRACHEOSTOMY (adult or peds) with Respiratory Distress

1. IMC special considerations: Assess the following:
   - Airway patency & lung sounds; RR; WOB; oxygenation by skin color & temp, SpO₂, ETCO₂ (if available)
   - ineffective airway clearance as evidenced by crackles and wheezes; need to suction
   - Tube position
   - Tracheostomy cuff to ensure that it is deflated unless pt is on a ventilator or if pt has excessive secretions
   - Tracheostomy site
     - Redness, swelling; character & amount of secretions
     - Tracheostomy ties - should be secure but not too tight
     - Subcutaneous emphysema around site
   - Stoma for presence of purulence or bleeding
   - Need of tracheostomy care
   - ECG

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

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

4. Respiratory distress:
   - Have disposable inner cannula available at all times. Suction after removing inner cannula if present
   - Place inner cannula back in tracheostomy to allow attachment of BVM
   - O₂ per tracheostomy collar or blow by & initiate supportive ventilation via BVM prn using 15 L O₂
   - Maintain head position to open airway maximally
   - Have second tracheostomy tube available if possible
   - Dislodgement of trach tube: In an emergency, insert the replacement trach tube reassess patency

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

Suspected angina or acute MI with or without pain

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

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

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

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

1. Begin immediate IMC
   - Perform brief, targeted history & physical exam; identify STEMI quickly; determine time of symptom onset
   - Assess for rate, rhythm, pump, volume problem; hypoperfusion & cardiorespiratory compromise Rx per appropriate SOP.
   - Decrease 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%

2. ASPIRIN 324 mg (4 tabs 81 mg) chewed and swallowed while prepping for 12 Lead ECG
   - Give to all w/ suspected ACS regardless of pain unless contraindicated or an adequate dose of immediate-release ASA can be verified as taken. Do not give if chest pain follows acute trauma. If indications unclear, contact OLMC.

3. 12-L ECG
   - Perform early (preferably w/ 1st set of VS) and within 5 min of pt contact; ensure correct lead placement & excellent data quality. Capture while stationary; may transmit while moving.
     - If 12 Lead ECG indicates AMI (STEMI): Contact OLMC with STEMI alert ASAP; place defib pads per policy Communicate: ECG findings (transmit tracing if able; if unable to transmit, read interpretation to hospital)
     - Pt age, gender, DNR status Time of symptom onset Primary physician/cardiologist if known
     - If taking a blood thinner PMH of MI, PCI/stent/CABG, renal failure, or contrast allergy (GWTG)

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

<table>
<thead>
<tr>
<th>NONE to MILD cardiopulmonary compromise + pain/discomfort present</th>
<th>EMERGENT: Moderate cardiopulmonary 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>
<tr>
<td>4. NITROGLYCERIN (NTG) 0.4 mg SL [BLS] (unless contraindicated – see drug appendix)</td>
<td>4. Complete IMC: IV NS 200 mL fluid challenge if lungs clear</td>
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<tr>
<td>Complete IMC: IV NS TKO</td>
<td>5. NITROGLYCERIN 0.4 mg SL (unless contraindicated) [BLS]</td>
</tr>
<tr>
<td>6. Pain persists &amp; SBP ≥ 90 (MAP ≥ 65) Repeat NTG 0.4 mg SL every 3-5 min X 2; monitor for hypotension [BLS]</td>
<td>7. Pain persists &amp; SBP ≥ 90 (MAP ≥ 65) 3-5 min. after 3rd NTG: FENTANYL</td>
</tr>
</tbody>
</table>

CRITICAL (Severe cardiopulmonary compromise):

- Altered sensorium + S&S hypoperfusion; SBP < 90 (MAP <65)

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

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

Sedation If SBP ≥ 90 (MAP≥ 65):

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

Pain: FENTANYL standard dose per IMC
BRADYCARDIA with a PULSE

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

1. Assess for rate, rhythm, pump, or volume problem; hypoperfusion and cardiorespiratory compromise
   Goal: Maintain adequate perfusion; treat underlying cause per appropriate SOP:
   Differential: MI, hypoxia, pacemaker failure, hypothermia, sinus brady, athletes, increased ICP, stroke, spinal cord lesion w/ neurogenic shock, sick sinus syndrome, AV blocks, hyperkalemia with wide complex bradycardia; toxin exposure (beta-blocker, calcium channel blocker, organophosphates, digoxin), electrolyte disorder
   If hypotensive & bradycardic: Correct rate problem first unless VT / VF (see those SOPs)

2. IMC: Support ABCs; determine need for airway mgmt; O₂ as needed to maintain SpO₂ at 94%  
   ECG monitoring; obtain, review, and transmit 12-lead ECG per ACS SOP (don’t delay therapy)
   If AMS: Assess blood glucose; treat hypoglycemia per SOP
   IV/IO access, consider IVF challenges if hypotensive and lungs clear

3. If possible ACS & alert with gag reflex: Treat per ACS SOP: Ischemia: ASA; pain (if SBP ≥ 90 (MAP ≥ 65): fentanyl (NTG contraindicated due to slow HR)

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

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

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

EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise

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

   Time sensitive pt

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

   If atropine ineffective or contraindicated

5. DOPAMINE IVPB: 5 mcg/kg/min; may titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥65)

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

   If SBP ≥ 90 (MAP ≥65) after above intervention: Assess indications/contraindications for sedation and pain mgmt:

   Sedation: MIDAZOLAM as below. If condition deteriorating and critical, omit sedation.
   Pain: FENTANYL standard dose per IMC

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

   MIDAZOLAM 2 mg increments slow IVP q, 2 min (0.2 mg/kg IN) up to 10 mg IVP/IN titrated to pt response.
   If IV unable and IN contraindicated: IM dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: May repeat prn to a total of 20 mg prn if SBP ≥ 90 (MAP ≥65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
NARROW QRS Complex Tachycardia
w/ pulse & HR > 100

1. **Consider/treat for possible underlying causes:** pain, fever, anemia, anxiety, medications (caffeine, diet pills, thyroid, decongestants), cocaine, amphetamines, history of dysrhythmia, HF; cardiac ischemia, hypoperfusion, cardiorespiratory compromise, and compensation for other pathologies etc.
   - **Rate problem:** Tachycardia w/ w/o coordination between atria & ventricles is reducing CO - use this SOP
   - **Pump problem:** HR > 100 & LV failure; - see HF/Pulmonary Edema/Cardiogenic Shock
   - **Volume/vessel problem:** See Hypovolemic, anaphylactic, septic shocks
   - **Metabolic problem:** See Glucose Emergencies, Drug OD, & Renal emergencies

2. **IMC:** Support ABCs as needed
   - Identify rhythm; obtain, review and transmit 12-lead ECG per ACS SOP if available
   - IV NS TKO in proximal vein (AC/external jugular); assess blood glucose – treat hypoglycemia per SOP
   - If unconscious: defer vascular access until after cardioversion

3. If possible ACS & alert with gag reflex: Treat per ACS SOP: Ischemia: ASA; pain: (if SBP ≥ 90 (MAP ≥ 65): fentanyl (NTG contraindicated due to fast HR)

4. If possible ACS & alert with gag reflex: Treat per ACS SOP: Ischemia: ASA; pain: (if SBP ≥ 90 (MAP ≥ 65): fentanyl (NTG contraindicated due to fast HR)

5. **SVT persists:**
   - **PSVT, reentry SVT (PSVT), AT, JT**
   - **ADENOSINE 6 mg rapid IVP + 20 mL NS flush**
     (Contraindication: asthma)
   - **SVT persists or recurs w/in 1-2 min:**
     - **ADENOSINE 12 mg rapid IVP + 20 mL NS flush**
   - Rhythm persists: Go to irregular R-R

6. **Rhythm persists:** Go to irregular R-R
   - **Note:** HR of 120-150 in AF may require drug therapy.
     Contact OLMC for orders. Do not give to WPW.
   - **VERAPAMIL 5 mg SLOW IVP over 2 min (over 3 min in older patients). May repeat 5 mg in 15 min.**

7. **SVT persists or recurs w/in 1-2 min:**
   - **ADENOSINE 6 mg rapid IVP + 20 mL NS flush**
   - **Note:** HR of 120-150 in AF may require drug therapy.
     Contact OLMC for orders. Do not give to WPW.
   - **VERAPAMIL 5 mg SLOW IVP over 2 min (over 3 min in older patients). May repeat 5 mg in 15 min.**

8. **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
   - Support ABCs; ongoing assessment of cardiorespiratory status enroute

**Notes:**
- If unresponsive to Adenosine/Verapamil and questionable QRS width (> 0.10 sec): Refer to VT SOP
- DC cardioversion is ineffective in junctional and ectopic atrial tachycardias
- *PSVT & A-flutter often responds to lower energy levels, start with 50 J
WIDE COMPLEX TACHYCARDIA with a PULSE
(QRS 0.12 sec or longer) – VT; SVT with aberrancy, WPW; torsades de pointes

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

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

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<th>Time sensitive pt</th>
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<tr>
<td>Regular Monomorphic VT; polymorphic VT w/ normal QT interval; WPW; Irregular wide complex tachycardia; AF w/ aberrancy; AF w/ WPW (short PR, delta wave)</td>
</tr>
</tbody>
</table>
4. AMIODARONE 150 mg mixed with 7 mL or 100 mL NS slow IVP or IVPB over 10 min or Complete dose even if rhythm converts.
   OLMC may order ADENOSINE 6 mg rapid IVP
   Contraindication: polymorphic rhythm
5. Chest pain: NTG per ACS SOP if HR drops to 100 or less. If pain persists: Fentanyl standard dose.

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

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<tbody>
<tr>
<td>4. Sedation: If responsive &amp; 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.</td>
</tr>
</tbody>
</table>
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 p. 103

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

BTE = Biphasic Truncated Exponential, RB = Rectilinear Biphasic
**VENTRICULAR FIBRILLATION (VF)**  
& **PULSELESS VENTRICULAR TACHYCARDIA (PVT)**

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

**Do the following simultaneously in separate time cycles.**

**After each 2 min cycle of CPR**
- Using real-time CPR feedback device if available:
  - **Check rhythm & ETCO₂** – as above
  - **Shockable?** Resume compressions and deliver shocks as above; resume compressions immediately
  - **Not shockable?** Asystole/PEA: resume compressions
  - **Organized rhythm?** ✓ palpable pulse → ROSC

**Switch compressors during rhythm ✓**
- NO rhythm/pulse check until after 2 min of CPR unless pt wakes or move extremities
- Repeat pattern as long as CPR continues - PLUS

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

**ALS interventions with no interruption to CPR**
- **Establish vascular access (IV/IO):** NS TKO
- **When IV/IO available, give meds during CPR:**
  - **EPINEPHRINE (1mg/10mL)** 1 mg IV/IO
  - Repeat every 3-5 min as long as CPR continues.
  - **AMIODARONE 300 mg IVP/IO**
  - After 5 min: AMIODARONE 150 mg IVP/IO

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

**Return of spontaneous circulation (ROSC):**
- Watch for abrupt rise in capnography; assess VS; ECG, SpO₂; ETCO₂ q. 5 min.
- **Support ABCs; remove impedance threshold device;** assist ventilations / start 2nd IV if needed
- **BP support is a high priority:** If SBP < 90 (MAP < 65) IV wide open while prepping **Dopamine:**
  - **DOPAMINE IVPB: 5 mcg/kg/min;** may titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥65)
  - Keep fingers on pulse & watch SpO₂ pleth on monitor for 5 min to detect PEA; Goal: MAP 90-100

**If patient remains unresponsive to verbal commands w/ no contraindications:**
- Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.
- Avoid hyperthermia & hyperglycemia

**Defibrillator energy recommendations**

<table>
<thead>
<tr>
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<th>Adult Defib J</th>
</tr>
</thead>
<tbody>
<tr>
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<td>NA</td>
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<tr>
<td>Zoll all series</td>
<td>RB</td>
<td>120-150-200</td>
</tr>
</tbody>
</table>
ASYSTOLE; PEA

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

Search for and treat possible contributing factors (Hs & Ts):
- Hypoxia (ventilate/O2)
- Hypothermia (core rewarm)
- Toxins (opiate? Naloxone; TCA? NaHCO₃)
- Hypovolemia (IVF boluses)
- Hypo/hyperkalemia (NaHCO₃)
- Hypoglycemia (glucose)
- Tamponade, cardiac (IVF)
- Thrombosis (coronary/pulmonary)
- H ion (acidosis; NaHCO₃)
- Hypo/hyperglycemia
- Tension pneumothorax (lung snds; pleural decompression)

Search for and treat possible contributing factors (Hs & Ts):
- Hypoxia (ventilate/O2)
- Hypothermia (core rewarm)
- Toxins (opiate? Naloxone; TCA? NaHCO₃)
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- Thrombosis (coronary/pulmonary)
- H ion (acidosis; NaHCO₃)
- Hypo/hyperglycemia
- Tension pneumothorax (lung snds; pleural decompression)

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

- Determine unresponsiveness; open airway (manually); assess for breathing/gasping; suction pm; simultaneously Assess pulse: If not definitively felt in <10 sec - Begin quality CPR with compressions (See appendix p. 89)
- Apply defib pads with chest compressions in progress as soon as monitor [ALS]/AED [BLS] is available
- Disconnect Lifevest batteries; remove vest if present; DO NOT disconnect VAD batteries – See p. 23
- Check rhythm: Pause compressions just long enough to determine if rhythm is shockable (< 5 sec)
- Not Shockable? Resume compressions; no rhythm/pulse check until after 2 min of CPR unless pt wakes or begins to move extremities (see below)

Airway/ventilations:
- Witnessed arrest; shockable rhythm: Delayed PPV; do 3 cycles (200) compressions before ventilating; O₂/NRM
- Unwitnessed arrest: BLS airways; ventilate with BVM; CPR at 30:2 ratio (5 cycles = 2 min); give 15 L O₂ when available
- Attach impedance threshold device (RQP/ITD) to mask/adv airway and capnography between mask and bag

Do the following simultaneously in separate time cycles.

After each 2 min cycle of CPR (using real-time CPR feedback device if available):
- Check rhythm every 2 minutes
  - Asystole/PEA persists/no shock advised: continue CPR
  - If organized activity, √ pulse
  - If pulse present → ROSC
- Switch compressors during rhythm √
  - NO rhythm or pulse check until after 2 min of CPR unless pt wakes or move extremities
  - Repeat pattern as long as CPR continues

ALS interventions with no interruption to CPR
- Establish vascular access (IV/IO): NS TKO
- When IV/IO available, give meds during CPR:
  - EPINEPHRINE (1mg/10mL) 1 mg IV/IO
    - Repeat every 3-5 min as long as CPR continues.
  - Advanced airway if needed: 10 BPM (NO hyperventilation)
- After advanced airway: no compression pause for breaths
- As time allows: √Hs & Ts (see above; treat appropriately)
- SODIUM BICARBONATE 1 mEq/kg IV/P/O: Give only if arrest is caused by a bicarbonate-responsive acidosis (DKA/tricyclic antidepressant or ASA OD, cocaine or diphenhydramine) or known hyperkalemia.

Return of spontaneous circulation (ROSC): Watch for abrupt rise in capnography; assess VS; ECG, SpO₂, ETCO₂ q. 5 min.
- Support ABCs; remove impedance threshold device; assist ventilations / start 2nd IV if needed
- Do not hyperventilate even if ↑ ETCO₂: titrate O₂ to SpO₂ 94% (avoid hyperventilation and hyperoxia); follow appropriate SOP.
- BP support is a high priority: If SBP < 90 (MAP < 65): IV wide open while prepping DOPAMINE
- Dopamine IVPB: 5 mcg/kg/min; may titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥65)
  - Keep fingers on pulse & watch SpO₂ pleth on monitor for 5 min to detect PEA; Goal: MAP 90-100
  - 12 L ECG ASAP after ROSC (call alert if STEMI); assess glucose (Rx hypoglycemia)

If patient remains unresponsive to verbal commands w/ no contraindications:
- Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.
- Avoid hyperthermia & hyperglycemia

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

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

Low Acuity to EMERGENT: Mild to Moderate cardiorespiratory/perfusion compromise
Alert, normotensive or hypertensive (SBP ≥ 90 and DBP ≥ 60) (MAP ≥ 65)

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 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
4. Severe anxiety and SBP ≥ 90 (MAP ≥ 65): **MIDAZOLAM** standard dosing per ACS SOP

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

1. IMC special considerations:
   - Assess need for advanced airway to ↓ work of breathing, protect airway, or ventilate patient
   - Assess for hypovolemia/dehydration
2. If hypovolemic and/or dehydrated - lungs clear and ventilations unlabored:
   - NS IVF in 200 mL increments up to 1 L; attempt to achieve SBP ≥ 90 (MAP≥ 65). Frequently reassess lung sounds.
3. **DOPAMINE IVPB:** 5 mcg/kg/min; may titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥65)
4. If possible ACS: (alert with gag reflex): **ASPIRIN 324 mg** (4 tabs 81 mg) PO per ACS SOP

**Sampling of drugs prescribed for patients with CV disease/Heart Failure**

**ACE Inhibitors (ACEI):** Benzaprîl (Lotensin), captoprîl (Capoten), enalaprîl (Vasotec), fosinoprîl, monoprîl, lisinoprîl (Prinivil/Zestril), moesiprîl (Univasc), perindoprîl (Aceon), quinaprîl, accuprîl, Ramiprîl (Altace), trandolaprîl (Mavik)

**Angiotensin Receptor Blockers (ARB):** candesartan (Atacand), eprosartan (Teveten), irbesartan (Avapro), losartan (Cozaar), olmesartan (Benicar), telmisartan (Mircardis), valsartan ( Diovan)

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

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

**Calcium channel blockers:** amloprîde (Norvasc), felodipîne, diltiazem (Cardizem), nicardipine (Cardene), nifedipine (Procardia, Adalat), verapamil (Calan, Isoptin)

**Diuretics:** amilorîde (Midamor), bumetanîde (Bumex), chlorothiazide (Diuril), Diazide, furosemîde (Lasix), hydrochlorothiazide (Hydrodiuril), indapamîde (Lozol), metolazone (Zaroxelyn), Polythiazide, spironolactone (Aldactone), torsemide, triamterenî (Diuren)

Digoxin (Lanoxin)

**Vasodilators:** hydralazîne (Apresoline), isosorbide (Isordil), minoxidîl (Loniten), nesîrîde (Natrecur), Nitrâtes/NTG
LV assist device (LVAD): Battery operated, mechanical pump surgically implanted next to native heart. A tube pulls blood from LV into pump that bypasses aortic valve to send blood directly into aorta. Purpose: help a weakened ventricle.

1. CALL LVAD Coordinator listed on patient information sheet for instructions
   
   EMS personnel are authorized to follow directions of the LVAD Coordinator

2. Patient may or may not have a peripheral pulse or normal BP at any time; \( \text{SpO}_2 \) registers if perfusion is present

3. Evaluate perfusion based on mental status, skin signs

4. CHEST COMPRESSIONS ARE ALLOWED if patient is unconscious and non-breathing.- see below.
   Follow all other BLS and ALS protocols.

5. Patient may be defibrillated, as necessary for V-fib with loss of consciousness, without disconnecting the pump.

6. Do not defibrillate over the pump; defibrillate at nipple line or above. Anterior-posterior pad placement preferred.

7. ECG waveforms may have a lot of artifact due to the device.

8. Patients will often have pacemakers and/or Internal Cardioverter Devices (ICDs).

9. Waveforms may be flat; without amplitude in spite of accurate readings – i.e. pulse ox.

10. Patient should have a binder with record of daily VAD parameters.

11. Patients will be on anticoagulation medications

12. NO MRIs - CT Scans are ok; avoid water submersion; avoid contact with strong magnets or magnetic fields

13. Never remove both sources of power (batteries) at the same time!
Acute ABDOMINAL/FLANK PAIN

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

LOWER ACUITY: NONE to MILD cardiorespiratory compromise
Alert, SBP ≥ 90 (MAP ≥ 65), no evidence of tissue hypoperfusion or shock

2. Transport in position of comfort

EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise
Altered sensorium, signs of hypoperfusion.

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)
   ▪ If suspected abdominal aortic aneurysm (AAA): Do not give IV fluid challenges unless SBP < 80

DIALYSIS / Chronic Renal Failure Emergencies

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

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

2. Treat per appropriate SOP and with special considerations listed below

HYPOTENSIVE (CRITICAL):
SBP < 90 (MAP < 65); & S&S hypoperfusion
Occurs during dialysis due to rapid removal and acute reduction in fluid volume. Other causes: hemorrhage, cardiogenic shock, sepsis, electrolyte disorders, anaphylaxis, pericardial tamponade, or pulmonary embolism.

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

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

2. Treat dysrhythmias per appropriate SOP with the following addition(s):
   ▪ SODIUM BICARBONATE 50 mEq slow IVP over 5 min followed by 20 mL NS IV flush
   ▪ No IV: In-line ALBUTEROL 5 mg continuous neb up 20 mg (throughout transport) [BLS]
   ▪ OLMC may order use of both
3. Do NOT give magnesium sulfate to these patients.
1. **IMC** special considerations:
   - Do not assume that the smell of alcohol automatically means intoxication; consider alternative causes of impaired behavior/motor incoordination
   - Assess mental status and cognitive functioning per AMS SOP
     If GCS 8 or less: Assess need for DAI or alternate advanced airway
   - Assess hydration status: If dehydrated: sequential IV NS 200 mL fluid challenges
   - Assess for hallucinations, delusions, tremors
   - Ask patient about time and amount of last alcohol ingestion

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

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

4. If generalized tonic/clonic seizure activity:
   - MIDA ZO LAM 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 pm 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
     - If unable to start IV: GLUCAGON 1 mg IM/IN [BLS]
     - If borderline (60-70): DEXTROSE per Glucose emergencies SOP
   - Observe and record response to treatment; recheck glucose level; may repeat Dextrose pm.
     - 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):
       - MIDA ZO LAM 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg IVP/IN titrated to pt response.
       - If IV unable and IN contraindicated: IM dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
       - All routes: May repeat pm to a total of 20 mg pm 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.


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**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>
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</thead>
<tbody>
<tr>
<td><strong>A:</strong> Alcohol and ingested drugs/toxins; ACS/HF, arrhythmias, anticoagulation</td>
</tr>
<tr>
<td><strong>E:</strong> 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>
</tr>
<tr>
<td><strong>I:</strong> Insulin disorders: hypoglycemia; DKA/HHNs</td>
</tr>
<tr>
<td><strong>O:</strong> O2 deficit (hypoxia), opiates, overdose, occult blood loss (GI/GU)</td>
</tr>
<tr>
<td><strong>U:</strong> Uremia; other renal causes including hypertensive problems</td>
</tr>
<tr>
<td><strong>T:</strong> (recent) Trauma, temperature changes</td>
</tr>
<tr>
<td><strong>P:</strong> Psychological; massive pulmonary embolism</td>
</tr>
<tr>
<td><strong>S:</strong> Space occupying lesions (epi or subdural, subarachnoid hemorrhage, tumors); stroke, shock, seizures</td>
</tr>
</tbody>
</table>

| **H:** Head injury |
| **E:** Epilepsy |
| **A:** Aneurysm |
| **D:** Drugs/psychiatric causes |
| **H:** Hypoxia or heart disease |
| **E:** Embolism |
| **R:** Arrhythmia |
| **H:** 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
- **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
- **General appearance:** odors on breath; evidence of alcohol/drug abuse; trauma
- **VS:** observe for abnormal respiratory patterns; ↑ or ↓ T; orthostatic changes
- **Skin:** Lesions that may be diagnostic of the etiology
- **Neuro exam:** Pupils/EOMs; visual deficits; motor/sensory exam; for nuchal rigidity; EMS stroke screen

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

2. Obtain and record blood **glucose** level (capillary and/or venous sample)
   - If < 60 or low: **DEXTROSE per Glucose emergencies SOP**
     - If unable to start IV: **GLUCAGON 1 mg IM/IN** [BLS]
     - If borderline (60-70): **DEXTROSE per Glucose emergencies SOP**
   - Observe and record response to treatment; recheck glucose level; may repeat Dextrose prn.
   - If 70 or greater: Observe and continue to assess patient

3. If **possible opiate toxicity** w/ AMS & respiratory depression/arrest: **NALOXONE IVP/IO** [ALS] IN/IM [BLS]
   - If spontaneously breathing: 0.4 mg; repeat q. 30 sec until ventilations increase up to 4 mg
   - If apneic: 1 mg. May repeat q. 30 sec until breathing resumes up to 4 mg. All additional doses require OLMC.

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

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

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

1. **History:** Determine method of injury: ingestion, injected, absorbed, or inhaled; pts often unreliable historians.

2. **IMC special considerations:**
   - Uncooperative behavior may be due to intoxication/poisoning; do not get distracted from assessment of underlying pathology
   - Anticipate hypoxia, respiratory arrest, seizure activity, dysrhythmias, and/or vomiting
   - Assess need for advanced airway if GCS ≤ 8, aspiration risk, or airway compromised unless otherwise specified
   - Support ventilations w/ 15L O₂/BVM if respiratory depression, hypercarbic ventilatory failure
   - Large bore IV/IO NS titrated to adequate perfusion (SBP ≥90; MAP ≥ 65); monitor ECG
   - Impaired patients may not refuse treatment/transport

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

4. **If possible opiate toxicity w/ AMS & respiratory depression/arrest:** NALOXONE IVP/IO [ALS] IN/IM [BLS]
   - If spontaneously breathing: 0.4 mg; repeat q. 30 sec until ventilations increase up to 4 mg
   - If apneic: 1 mg. May repeat q. 30 sec until breathing resumes up to 4 mg. All additional doses require OLMC.

5. **Anxiety-serotonin syndrome:** MIDAZOLAM 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg titrated to response Tonic clonic seizures: MIDAZOLAM 2 mg increments IVP/IQ q. 30-60 sec (0.2 mg/kg IN) up to 10 mg IVP/IN/IO prn If IV/IO unable/IN contraindicated - IM: 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose
   - All routes: May repeat to total of 20 mg prn if SBP≥ 90(MAP≥ 65) unless contraindicated.
   - If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg for anxiety.

### BETA BLOCKER

- “LOLs” - See list on Pulmonary Edema/Cardiogenic shock SOP.
- If HR < 60 & SBP < 90 (MAP < 65): & unresponsive to atropine, norepinephrine, & pacing per Bradycardia w/ Pulse SOP:
  - GLUCAGON 1 mg IVP/IN/IO/IM.

### CYCLIC ANTIDEPRESSANTS (Block Na channels and alpha receptors): Adadin, 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

- If hypotensive: IV/IO NS wide open up to 1 L

- If wide QRS: SODIUM BICARB 1 mEq/kg IVP.
  - Repeat dose if ↓ BP, deterioration of mental status, wide QRS, or dysrhythmias.

### DEPRESSANTS: *Barbiturates*:

- Phenobarbital, Seconal (secobarbital) *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

- 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 diphendydramine, look for S&S of tricyclic antidepressant-like sodium channel blockade (wide QRS and/or abnormal R wave in aVR).

- Treat Na channel blockade with SODIUM BICARBONATE (See cyclic antidepressants)

### HALLUCINOGENS:

- Lysergic acid diethylamide (LSD), phencyclidine (PCP, Angel dust, TIC); cannabis, ketamine, methoxetamine (MXE) - analog of 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.

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

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**INHALANTS:** Caustic 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 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.

- Look for discoloration, spots or sores around the mouth, nausea, anorexia, chemical breath odor and drunken appearance. Supportive care.
2. Transport lower acuity/stable patients to nearest hospital

5. Per OLMC: A

4. If hypotensive or pulseless:

3. Establish OLMC ASAP so receiving hospital is prepared for your arrival

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

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

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

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

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

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

STIMULANTS: Amphetamines: Benzedrine, Dexedrine, Ritalin, Methamphetamine (crystal, ice); ECSTASY: “Molly” -MDMA (methylene-dioxy-methamphetamine), designer drug used at “rave” parties with stimulant and hallucinogenic properties. Produces feelings of increased energy and euphoria and distorts users’ sense and perception of time. May have S&S of serotonin syndrome (hyperthermia, HTN, tachycardia, AMS, coma, respiratory or cardiac arrest.

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

8. If hallucinations: quiet environment devoid of stimulation (lights, noise and touch)

CARBON MONOXIDE POISONING

1. IMC special considerations:
   - Use appropriate Haz-mat precautions & PPE; remove patient from CO environment as soon as possible
   - O₂ 12-15 L/NRM or BVM; ensure tight seal of mask to face; SpO₂ UNRELIABLE to indicate degree of hypoxemia
   - Vomiting precautions; ready suction; monitor ECG
   - Keep patient as quiet as possible to minimize tissue oxygen demands
   - CO screening per System policy if available. If using CO-oximeter >12% abnormal, (<3% CO normal, smokers may have as high as 10%); use manufacturer standard levels if given; carefully assess for clinical correlation due to questionable device sensitivity.

2. Transport lower acuity/stable patients to nearest hospital
   - Severely confused/hemodynamically stable: Consider transporting directly to a facility w/ a hyperbaric chamber (OLMC order). CRITICAL: If in respiratory/cardiac arrest or airway unsecured, transport to nearest hospital.

Hyperbaric oxygen chambers

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

CYANIDE EXPOSURE (CRITICAL)

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

Assess for hypotension, CNS depression, metabolic acidosis, soot in nares or respiratory secretions, rapid CV collapse, central apnea, and seizures.

1. PPE including SCBA; evacuate danger area

2. IMC per Drug OD/Poisoning SOP; decontaminate as necessary. Do NOT direct water jet on liquid.
   - Absorb liquid in sand or inert absorbent and remove to a safe place. Remove vapor cloud w/ fine water spray.
   - Remove contaminated clothing and wash skin with soap and water for 2-3 min.

3. Establish OLMC ASAP so receiving hospital is prepared for your arrival

4. If hypotensive or pulseless: IV/IO NS wide open. CPR as indicated.

5. Per OLMC: Antidotes if available: AMYL NITRITE inhalants 1 per min X 12 min OR HYDROXOCOBALAMIN 5 gm IV (one vial) given IVPB over 15 minutes. May repeat X 1 if available and response inadequate to 1st dose. Max total dose 10 g.

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

FROSTBITE

1. **ITC:** Move to a warm environment as soon as possible. Remove wet/constrictive clothing/jewelry.
2. Rapidly rewarm frozen areas. Do NOT thaw if chance of refreezing.
   - 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-if available, FENTANYL:** Standard dosing per IMC.

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

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

MILD/MODERATE Hypothermia (Lower acuity to EMERGENT)

Mild: Core temp 90.6-95° F (32-35° C): Confusion, tachycardia, shivering
Moderate: Core temp 82.4-90.6° F (28-32° C): lethargy, bradycardia, arrhythmias, shivering ceases <31°C (87.8°F); heat production falls, slowed speech/ataxia (mimics stroke) replaced by muscle rigidity, slowed reflexes, slow RR, 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 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 airway support:** If KING Tube 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 IVP/IO fluid challenges up to 1 L
     - Will require large volume replacement due to leaky capillaries, fluid shift, and vasodilation as rewarming occurs
   - If unresponsive with no breathing or no normal breathing (only gasping) check for a pulse.
     - Pulse is not definitely felt in 30 seconds: Start CPR - **TRIPLE ZERO CANNOT BE CONFIRMED on these patients**
     - Rhythm shockable: **Defibrillate** per VF SOP
     - Treat patient per VF or Asystole/PEA SOP concurrent with rewarming
4. **ROSC:** Support CV status per VF / Asystole SOPs; look for & treat causes of severe hypothermia
   - If induced hypothermia indicated: Continue to warm to goal temp of 34° C / 93.2° F
   - If hypothermia contraindicated (trauma patient); continue rewarming to normal temp
5. Transport very gently to avoid precipitating VF
Environmental: SUBMERSION INCIDENT

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

1. ITC special considerations:
   - Rescue and removal: Ensure EMS safety during the rescue process; only rescuers with appropriate training and equipment should enter moving or deep water to attempt rescue
     - Rescue personnel should wear protective garments if water temp is < 70˚
     - A safety line should be attached to the rescue swimmer
     - Patient should be kept in a horizontal position if at all possible. Cold-induced hypovolemia, cold myocardium, and impaired reflexes may result in significant hypotension. If hypothermic, appropriate rewarming should be done concurrent with resuscitation.
   - Selective spine precautions only if circumstances suggest a spine injury
   - EMERGENT: If awake with good respiratory effort, yet congested and increased work of breathing: O₂ /C-PAP mask to deliver 5-10 cm PEEP; use 15 L/NRM if CPAP unavailable or contraindicated
     If SBP falls < 90 (MAP < 65): Titrate PEEP down to 5 cm; remove C-PAP if hypotension persists
   - CRITICAL: If unresponsive and ineffective ventilations with a pulse: Ventilate using BLS airways and BVM. No need to clear airway of aspirated water by any means other than suction. Abdominal thrusts contraindicated. Pts usually respond after a few ventilations. Consider need for advanced airway if patient does not respond to initial bag and mask ventilations.
   - CRITICAL: If unresponsive, apneic and pulseless: CPR using traditional A-B-C approach due to hypoxic nature of arrest. Rx per appropriate SOP.
   - Vomiting is common in those who require compressions & ventilations; prepare suction
   - Remove wet clothing; dry patient as possible – especially the chest before applying pads and defibrillating pt
   - If pt is cold: refer to HYPOTHERMIA SOP p. 29

2. Evaluate for ↑ICP: (↑ SBP, widened PP; ↓ pulse, abnormal respiratory pattern, gaze palsies, HA, vomiting)
   If present; treat per Head Trauma SOP p. 47

3. Enroute: Complete ITC: IV NS TKO [ALS]

Diving-related emergencies

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

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

Emergency contact -(919) 684-9111; additional info www.diversalertnetwork.org
### HEAT CRAMPS OR TETANY (Lower acuity) [BLS]

1. **IMC**: IV may not be necessary; if cramps severe/vomiting and/or oral electrolyte replacement unavailable; IV NS

2. Move patient to a cool environment, remove excess clothing, and transport
   Do **NOT** massage cramped muscles

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

**Time sensitive pt**

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

2. Move patient to a cool environment. Remove as much clothing as possible. [BLS]

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

**Time sensitive pt**

1. **IMC** special considerations:
   - Anticipate ↑ ICP; check for hypoglycemia
   - If SBP 110 or above: IV NS TKO (may use cold NS); elevate head of stretcher 10˚-15˚
   - If signs of hypoperfusion:
     - Place supine with feet elevated (do **NOT** place in Trendelenburg position) [BLS]
     - NS IVF challenge in consecutive 200 mL increments to maintain SBP ≥ 90 (MAP≥ 65)
     - Caution: Patient at risk for pulmonary and cerebral edema
   - Monitor ECG

2. Move to a cool environment. **Initiate rapid cooling**: [BLS]
   - Remove as much clothing as possible
   - Chemical cold packs (CCP) to cheeks, palms, soles of feet
     - If additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees
   - Sponge or mist with cool water and fan

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

### Medications/substances that predispose to heat emergencies:

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

**Blood glucose 70 or less or S & S of hypoglycemia**

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

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

3. **If bG is borderline 60-70:**
   - **DEXTROSE 10%** (25 g/250 mL) IVPB rapidly (wide open) - infuse **12.5 grams (125 mL)** or ½ IV bag
     - Observe for improvement while infusion is being given.
     - If S&S of hypoglycemia fully reverse and pt becomes decisional after partial dose, reassess bG.
     - If >70; slow D10% to TKO. Once full dose given, close clamp to D10% IV and open 0.9 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 **25 grams (entire 250 mL)**
     - Observe for improvement while infusion is being given.
     - If S&S of hypoglycemia fully reverse and pt becomes decisional after a partial dose, reassess bG.
     - If >70; slow D10% to TKO. Once full dose given, close clamp to D10% IV and open 0.9 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 IM/IN** – [BLS]

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

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

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

**Notes:**

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

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

## Stable / Acute Crisis

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

### NONE to MILD Cardiorespiratory compromise

<table>
<thead>
<tr>
<th>BP &gt; 140/90</th>
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<tr>
<td>No focal neurologic deficits</td>
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2. Assess for chest pain and/or pulmonary edema. If present: treat per appropriate SOP.
3. If patient is hypertensive but **without** CV or neurologic compromise: Transport without drug therapy to reduce BP
4. If severe headache:
   - **Adult:** 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 dose per SOP: 150 mcg (1.5 mcg/kg)
   - **Elderly (≥ 65) or debilitated:** 0.5 mcg/kg (max single dose 50 mcg) IVP/IN/IM/IO.
   - **Additional doses require OLMC:** 0.5 mcg/kg q. 5 min up to a total of 300 mcg if indicated & available.

### Hypertensive Crisis (CRITICAL):

<table>
<thead>
<tr>
<th>SBP &gt; 220 and DBP &gt; 130</th>
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<tbody>
<tr>
<td>Non-traumatic origin</td>
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</table>

Assess for S&S of end organ dysfunction: Neurovascular S&S (headache, visual disturbances, seizures, AMS, paralysis); chest pain and/or pulmonary edema
Assess stroke scale
DO NOT use drug therapy solely to rapidly lower BP in chronically hypertensive patients
Needs IV BP control at hospital – not in field

2. **IMC** special considerations:
   - Keep patient as quiet as possible; reduce environmental stimuli
   - If GCS ≤ 8: Assess need for airway support
   - Elevate head of stretcher 10°-15° with head/neck in neutral alignment
   - Seizure/vomiting precautions; suction only as needed
   - Repeat VS before and after each intervention
3. If chest pain or pulmonary edema: NITROGLYCERIN 0.4 mg [BLS] X1
4. **Contact OLMC for repeat dose of NTG.**
5. **If generalized tonic/clonic seizure activity:**
   - MIDAZOLAM 2 mg increments IVP/IO q. 30-60 sec (0.2 mg/kg IN) up to 10 mg IVP/IO/IN titrated to stop seizure.
   - If IV/IO unable and IN contraindicated: IM dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose. All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   - If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
6. Treat per appropriate Cardiac SOP.
1. Assess SCENE AND PERSONAL SAFETY. Call law enforcement personnel to scene, if needed. **BLS**
   - Inspect environment for bottles, drugs, letters, notes, or toxins.
   - Ask bystanders about recent behavioral changes.

2. Assess patient’s decisional capacity
   - Consciousness/arousal using GCS (see ITC for chart), attention span
   - Activity: restlessness, agitation (consolable or non-consolable), compulsions
   - Speech: rate, volume, articulation, content
   - Thinking/thought processes: delusions, flight of ideas, obsessions, phobias; thoughts of suicide/harm to others
   - Affect and mood: appropriate or inappropriate
   - Memory: immediate, recent, remote
   - Orientation: X 4, understands and complies with instructions
   - Perception: delusions, hallucinations (auditory, visual, tactile)
   - General appearance; odors on breath
   - Inspect for Medic alert jewelry; evidence of alcohol/drug abuse; trauma
   - Is patient a threat to self or others, or unable to care/provide for self?
   - Explore suicidal thoughts/intentions with patient directly. Bring any suicidal notes to hospital.

3. IMC special considerations:
   - Limit stimuli and the personnel treating the patient as much as possible.
   - Do not touch patient without telling them your intent in advance.
   - Provide emotional reassurance. Verbally attempt to calm and reorient the patient as able.
   - Avoid threatening or advanced interventions unless necessary for patient safety.
   - Protect patient from harm to self or others. Do not leave the patient alone.

4. If combative and/or uncooperative **(See possible medication Rx below):**
   - Attempt verbal reassurance to calm pt. If unsuccessful: Provide chemical and/or physical restraint per procedure.
   - Use only to protect the patient and/or EMS personnel.
   - They should not be unnecessarily harsh or punitive. Document reasons for use.
   - In an emergency, apply restraints; then confirm necessity with OLMC.
   - Ensure an adequate airway, ventilations, and peripheral perfusion distal to restraint after application.
   - Monitor patient's respiratory and circulatory status.

5. Consider medical etiologies of behavioral disorder and treat according to appropriate SOP:
   - Hypoxia; substance abuse/overdose; alcohol intoxication
   - Neurologic disease: stroke, seizure, intracerebral bleed, Alzheimer's, etc.
   - Metabolic disorders: hypoglycemia (✓ glucose), acidosis, electrolyte imbalance, thyroid/liver/renal disease etc.
   - Evidence of traumatic injuries

6. If patient is non-decisional and/or a threat to self or others and/or is unable to care for themselves
   - Complete Petition Form for all adults who meet above criteria: Persons who witnessed statements or behaviors should sign the form.
   - Make every effort to gain the patient’s consent for transport.
   - Refusing transport: Call OLMC from the scene. Pt must be transported against their will if necessary.
   - Ask police for assistance with transport if needed.

7. **Severe anxiety** and SBP ≥ 90 (MAP ≥ 65): **MIDAZOLAM** 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) **ALS** 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 pm 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.
A behavioral health crisis can be unpredictable and should be assessed and stabilized with adequate supports as soon as possible. Northwestern Hospitals can provide immediate access to a continuum of crisis stabilization services. Each facility offers the following services:

Northwestern Woodstock Hospital (3701 Doty) – Immediate access to Emergency Department/ Psychiatric Emergency Services (ED/PES), including short-term crisis stabilization and the inpatient adult psychiatric unit

Northwestern McHenry Hospital – Access to Emergency Department services and assessment within 45 minutes

Northwestern Huntley Hospital – Access to Emergency Department services and assessment within 45 minutes

The table below may be used as a guide in selecting the most appropriate location for immediate behavioral health care. A patient presenting with "life-safety risk" factors should be transported to the nearest medical facility. However, patients at “high” or “moderate” risk may benefit from being transported to the Northwestern Hospital – Woodstock location. A diversion to Northwestern Hospital – Woodstock ensures the following:
More immediate access to crisis assessment and stabilization services;
Additional supports for family members;
Increased collaboration with community partners (i.e. EMS, police, community providers, education, etc.);
A secure transition in care from EMS or police responders to Northwestern Hospitals.

<table>
<thead>
<tr>
<th>High-Risk - Medical/Psychiatric</th>
<th>High Risk - Psychiatric</th>
<th>Moderate Risk - Psychiatric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harm to self and in immediate need of medical attention (i.e. overdose, poison, strangulation, significant wounds, etc.)</td>
<td>Harm to self but stable to accommodate diversion to hospital within system</td>
<td>Threat of harm to self or others and stable for transport</td>
</tr>
<tr>
<td>Acute medical emergency with behavioral health presentation</td>
<td>Non decisional capacity but stabilized for transport.</td>
<td>Verbal or physical acting out but stable for transport</td>
</tr>
<tr>
<td>Harm to self or others and actively requiring physical intervention</td>
<td>Active hallucinations or delusions but not at risk of harming self or others</td>
<td>Reports of hallucinations or delusions</td>
</tr>
<tr>
<td>Active hallucinations or delusions and at immediate risk of harming self or others</td>
<td>Intoxicated - no immediate medical risk</td>
<td>Intoxicated</td>
</tr>
<tr>
<td>Intoxicated with altered mental status and concern for airway management, or at medical risk due to detoxification</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Transport to nearest medical facility**

**Consider transport to Northwestern- Woodstock ED- Psychiatric Emergency Services (PES)- may consult OLMC for guidance**

**Transport to Northwestern- Woodstock ED- Psychiatric Emergency Services (PES)**
STROKE

Patient history

○ Age
○ Onset: Abrupt or gradual
○ Time last seen normal for them
○ Duration of acute S&S
○ Medications (blood thinners)
○ Heart/vascular disease
○ Intracranial or intraspinal surgery, serious head trauma or previous stroke/TIA
○ AV malformation, tumor or aneurysm
○ Active bleeding or acute trauma
○ A-ﬁb/flutter, HTN; diabetes, smoking
○ High cholesterol, obesity
○ C/O new onset severe headache; stiff neck; seizure
○ Bleeding disorder: Sickle cell disease, hemophilia

S&S: (Prehospital Stroke Screen)

Acute onset...

Mental status

○ Level of consciousness; GCS
○ Speech: "You can’t teach an old dog new tricks." Slurred? Uses wrong words? Mute?
○ Questions: Age, month (orientation)
○ Commands: Open/close eyes

Cranial nerves

○ Facial asymmetry/droop: smile, show teeth
○ Vision deﬁcits: loss of visual ﬁelds; diplopia
○ Horizontal gaze abnormalities: dysconjugate gaze, forced or crossed gaze
○ Other deﬁcits: pupil changes; light sensitivity, deviated uvula; hoarse voice; vertigo/ diziness, sound sensitivity

Limbs

○ Unilateral weakness or paralysis (arm drift) – Close eyes, hold both arms out for 10 sec. Assess if arm drifts down compared to other side or is ﬂaccid.
○ Leg drift: Open eyes; lift each leg separately
○ Sensory: Arm/leg (close eyes; touch/pinch): note paresthesias, numbness
○ Coordination – arm/leg (ﬁnger-nose; heel-shin) Note loss of balance, coordination (ataxia), gait disturbance

Differential: Consider alternative causes of S&S

See Altered Mental Status SOP
○ Hypoglycemia (esp. elderly)
○ Brain tumor
○ Cardiac disease; dysrhythmia
○ Drug OD
○ Encephalitis
○ ↓ Na
○ Infection/sepsis
○ Seizures, syncope
○ Trauma
○ Isolated nerve dysfunction (radial nerve palsy or Bell’s palsy)

1. IMC special considerations: [BLS]
   ▪ Support ABCs as needed; O₂ if SpO₂ < 94% or O₂ sat unknown; avoid hypoxia and hyperoxia
   ▪ Seizure/vomiting precautions; suction only as needed
   ▪ Maintain head/neck in neutral alignment; do not use pillows. If SBP > 100: Elevate head of bed 10° - 15°
   ▪ Monitor ECG; acquire 12L if possible
   ▪ IV not necessary at scene unless hypoglycemia or need for DAI. Avoid multiple IV attempts/excess fluid loading.
     If IV started, insert 18 g antecubital line to facilitate time to CT at hospital.
     Repeat VS frequently & after each intervention. Anticipate hypertension & bradycardia due to ↑ ICP.
   ▪ Do NOT Rx hypertension or give atropine for bradycardia if SBP > 90 (MAP > 65)
   ▪ Provide comfort and reassurance; establish means of communicating with aphasic patients
   ▪ Limit activity; do not allow pt to walk; protect limbs from injury

2. If generalized tonic/clonic seizure activity: Observe and record seizure activity per SOP p. 37 [ALS]
   ▪ MIDAZOLAM 2 mg increments IVP/IO q. 30-60 sec (0.2 mg/kg IN) up to 10 mg prn titrated to stop seizure.
     If IV unable and IN contraindicated: IM 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
     All routes: May repeat prn to a total of 20 mg if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
     If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.

3. If AMS, seizure activity, or neurologic deﬁcit: Assess blood glucose per System procedure
   ▪ Benzodiazepine administration takes precedence over bG determination in pts who are actively seizing
   ▪ If < 70 or low reading: DEXTROSE / Glucagon per hypoglycemia SOP-[BLS] / [ALS]

4. Determine time last known well (last seen normal for patient) (not when pt woke w/ S&S present)

5. Obtain and document history; stroke screen; and other physical exam ﬁndings as above

6. Minimize scene time delays (< 10 minutes) - transport to the nearest PSC/CSC per decision tree next page

7. Pre-notify receiving hospital with Stroke Alert: Contact OLMC ASAP: Age; c/o sudden, severe HA; PMH (Meds – anticoagulants within past 48 hrs), PMH previous TIA/stroke, intracranial hemorrhage/aneurysm; S&S (Last seen normal for them), stroke screen ﬁndings, blood glucose; VS; Rx given

8. Obtain call back number from reliable historian; provide to receiving staff if not accompanying pt to hospital
Region IX STROKE TRANSPORT ALGORITHM

**EMS Stroke Screen: New Onset**
- Facial asymmetry/Droop
- Arm drift/Unilateral motor deficit
- Speech abnormal
- **Additional**
  - Ataxia (acute)
  - Vision loss (acute)
  - New onset gaze abnormality

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

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

- **Yes**
  Transport to CLOSEST hospital

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

- **3.5 - 6 hours**

- **YES – Stroke Center Destination**
  - GEA, MWLC, NWC, St. Joes EMSS
  - If ≤30 min scene to CSC → Comprehensive
  - If >30 min scene to CSC → Closest PSC**
  - LGH & SFV EMSS
  - If CSC ≤20 min beyond nearest PSC → CSC
  - If CSC >20 min beyond nearest PSC → PSC

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

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

- **Yes**
  Transport to CLOSEST hospital

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

- **3.5 - 6 hours**

- **YES – Stroke Center Destination**
  - GEA, MWLC, NWC, St. Joes EMSS
  - If ≤30 min scene to CSC → Comprehensive
  - If >30 min scene to CSC → Closest PSC**
  - LGH & SFV EMSS
  - If CSC ≤20 min beyond nearest PSC → CSC
  - If CSC >20 min beyond nearest PSC → PSC

- **NO close STROKE center**
  (Primary or Comprehensive)

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

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

**“Anticoagulants”**
- warfarin / Coumadin
- apixaban / Eliquis
- dabigatran / Pradaxa
- edoxaban / Savaysa
- enoxaparin / Lovenox
- rivaroxaban / Xarelto

**NOT considered an “anticoagulant” for this SOP**
- Aspirin
- clopidogrel / Plavix
- dipyridamole / Aggrenox
- prasugel / Effient
- ticagrelor / Brilinta

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

**CSC:** Comprehensive stroke center

**PSC:** Primary stroke center-
(CHM/ CHH/ CHW/ GSH)
SEIZURES

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

Consider possible etiologies:
- Anoxia/hypoxia
- Cerebral palsy or other disabilities
- Eclampsia
- Stroke/cerebral hemorrhage
- Trauma/child abuse

- Anticonvulsant withdrawal/noncompliance
- Infection (fever, meningitis)
- Metabolic (glucose, electrolytes, acidosis)
- Toxins/intoxication; OD; DTs
- Tumor

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

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

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

3. Identify and attempt to correct reversible precipitating causes (see above)
   - Benzodiazepine administration takes precedence over bG determination in pts who are actively seizing
   - Obtain and record blood glucose level per System procedure (capillary and/or venous sample)
   - If < 70: DEXTROSE or GLUCAGON per Hypoglycemia SOP [BLS/ALS]
**SHOCK Differential / Hypovolemic - Septic**

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

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

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

1. **ITC special considerations:**
   - 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 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 or below with suspected sepsis or septic shock.

2. Assess and treat specific condition/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>Norepinephrine</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</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, norepinephrine</td>
</tr>
<tr>
<td>Septic</td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>Hot, dry, flushed/ pale, cold mottling</td>
<td>Crackles if pulmonary origin</td>
<td>↓ (hyperventilation, metabolic acidosis)</td>
<td>IVF, norepinephrine</td>
</tr>
<tr>
<td>Anaphylactic</td>
<td></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, diphenhydramine, albuterol, ipratropium</td>
</tr>
</tbody>
</table>

**SEPSIS & SEPTIC shock**: Life-threatening dysfunction due to suspected infection: lung, urinary tract, gut & skin (adults).

Most frequent in those ≥65 or < 1 yr, or w/ weakened immune systems or chronic medical conditions (cancer, diabetes, kidney disease or catheter use)

**Septic shock**: Suspect if ETCO2 < 25 (correlates to lactate reading ≥4 mM/L (↑ mortality) and ≥2 qSOFA (Quick Sequential [Sepsis-related] Organ Failure Assessment) criteria: AMS (GCS <15); RR ≥22; SBP ≤100

3. Call OLMC with a Sepsis alert per local policy/procedure.
4. **NS 200 mL IV boluses** in rapid succession (max 30 mL/kg) to SBP ≥90 (MAP ≥65; reassess after each bolus.
5. **If hypotension persists after 500 mL IVF**: (2nd IV line while IVF continues in 1st) **DOPAMINE IVPB**: 5 mcg/kg/min; may titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥65)
Keep fingers on pulse & watch SpO2 pleth on monitor for 5 min to detect PEA.

See also: Anaphylactic shock (p. 13) Cardiogenic shock (p. 22) Neurogenic shock (p. 50)

**Obstructive shock**: Cardiac tamponade & Tension pneumothorax (p. 45); massive Pulmonary Embolism: IMC
INITIAL TRAUMA CARE (ITC)

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

SCENE SIZE UP: Situational awareness; dynamic risk assessment –Assess/intervene as needed:
- Scene safety: control and correct hazards/threats: (gas, powerlines, animals, people); form plan of approach; remove pt/responders from unsafe environment ASAP; attempt to preserve integrity of possible crime scene evidence
- Mechanism of injury (MOI): anticipate type/severity of injury
- Universal blood/body secretion & sharps precautions; use appropriate personal protective equipment prn
- Number of pts; triage/request additional resources if needed. Weigh risk of waiting for resources against benefit of rapid transport to definitive care. Consider if medium or large scale MPI declaration is needed.
- Take essential supplies/equipment to pt: hemorrhage control; airway & O₂ equipment; spine splitting devices; vascular access/IVF; pain mgt

PRIMARY ASSESSMENT [BLS]
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; C-A-B-C-D-E: Hemorrhage control first.
3. Level of consciousness: DVPU or GCS; chief complaint S&S
4. Re-sequencing priorities if exsanguinating external hemorrhage:
   - 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
   - Compare radial/carotid pulses for presence, general rate, quality, regularity, & equality; assess skin color, temp, moisture
   - No carotid pulse: Determine if CPR indicated →Traumatic Arrest SOP; if yes, quality CPR (see p. 89)
   - Assess bleeding type, amount, source(s) and rate; hemorrhage control:
     - Direct pressure; pressure dressings to injury. If direct pressure ineffective or impractical:
       - Pack wound w/ topical hemostatic gauze/ apply direct pressure. Freq. √ for bleeding.
     - Limb w/ uncontrolled bleeding: Tourniquet 2-3 cm proximal to wound; not over a joint; tighten until bleeding stops/distal pulse occluded. If bleeding continues, place 2nd proximal to 1st. Should be visible/well marked (time applied), do not remove. Anticipate pain.
     - Pelvic fx: Wrap w/ sheet, pelvic binder, or secure pelvis in upside down KED
   - If suspected cardiac tamponade, blunt aortic or cardiac injury → Chest Trauma SOP
6. CIRCULATION/perfusion:
   - Compare radial/carotid pulses for presence, general rate, quality, regularity, & equality; assess skin color, temp, moisture
   - No carotid pulse: Determine if CPR indicated →Traumatic Arrest SOP; if yes, quality CPR (see p. 89)
   - Assess bleeding type, amount, source(s) and rate; hemorrhage control:
     - Direct pressure; pressure dressings to injury. If direct pressure ineffective or impractical:
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     - Pelvic fx: Wrap w/ sheet, pelvic binder, or secure pelvis in upside down KED
   - If suspected cardiac tamponade, blunt aortic or cardiac injury → Chest Trauma SOP
   - Vascular access: Indicated for actual/potential volume replacement and/or IV meds prior to hospital arrival
     - IV 0.9% NS (warm if possible): Catheter size & infusion rate per pt size, hemodynamic status; SOP or OLMC
     - If in shock: 14-16 g, WO up to 1 L based on SBP (MAP); +/- radial pulse & coherent mental status.
     - Do not exceed BP targets. Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome.
     - Penetrating trauma to torso: Target SBP 80 (MAP 50-60) (permissive hypotension)
     - Blunt trauma: Target SBP 90 (MAP 60-65); Trauma w/ head inj: target SBP 110 (MAP>65) or higher
     - Do not delay transport in time-sensitive pts to establish elective vascular access on scene: Limit 2 attempts/route unless situation demands/OLMC order: may place peripheral line when moving; IO while stationary
     - IO indications: Critical pts needing urgent IVF/meds: burns, circulatory collapse; difficult/delayed/impossible venous access
     - May use central venous access devices already placed based on OLMC
   - Monitor ECG if actual or potential cardiorespiratory compromise
7. Disability: Rapid neuro exam: GCS; pupils; ability to move all four extremities (S&S ↑ICP or herniation)
   - If AMS: blood glucose per System procedure. If < 70: Treat per Hypoglycemia SOP.
8. Pain mgt if SBP ≥ 90 (MAP≥ 65): FENTANYL standard doses per IMC
   - Nausea: ONDANSETRON standard dose per IMC [BLS]
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 (SOP p. 42) or OLMC orders
• Scene use of helicopter or alternate transport means based on local System Policy/Procedure

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

1. Obtain full set of VS: BP (MAP if able) – 1st BP manually; subsequent automated OK; trend pulse pressures; Pulse: rate, quality, rhythmicity Respirations: rate, pattern, depth Temp if indicated
SAMPLE history: OPQRST of chief complaint/pain using approp 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, 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; 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.
Stable: At least q. 15 min & after each drug/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility
Unstable: More frequent reassessments; continue to reassess all abnormal VS & physical findings

4. Report pertinent positive/negative signs as able; any major changes from primary assessment
5. Document Revised Trauma Score parameters on ePCR/EHR
6. An EMS “time-out” to allow for an uninterrupted handover report after hospital arrival is useful in ensuring continuity of care especially if complete written/electronic ePCRs/EHRs are not left/downloaded at time of pt handoff (ACS, 2014).

<table>
<thead>
<tr>
<th>ADULT GLASGOW COMA SCORE (3-15)</th>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
<th>MOTOR RESPONSE</th>
<th>Total GCS</th>
<th>Total RTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spontaneous</td>
<td>Oriented &amp; converses</td>
<td>Obeys commands</td>
<td>4</td>
<td>*GCS Conversion pts for RTS</td>
</tr>
<tr>
<td></td>
<td>To voice</td>
<td>Confused speech</td>
<td>Localizes pain</td>
<td>3</td>
<td>GCS 13-15  4</td>
</tr>
<tr>
<td></td>
<td>To pain</td>
<td>Inappropriate words</td>
<td>Withdraws to pain</td>
<td>2</td>
<td>GCS 9-12  3</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Incomprehensible sounds</td>
<td>Abnormal flexion</td>
<td>1</td>
<td>GCS 6-8  2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td>Abnormal extension</td>
<td>1</td>
<td>GCS 4-5  1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td>0</td>
<td>GCS 3  0</td>
</tr>
</tbody>
</table>

*Glasgow Coma Score Conversion Points

<table>
<thead>
<tr>
<th>ADULT REVISED TRAUMA SCORE (0-12)</th>
<th>Respiratory Rate</th>
<th>Systolic BP</th>
<th>Total RTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10-29</td>
<td>90 or above</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>30 or above</td>
<td>76-89</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>6-9</td>
<td>50-75</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1-5</td>
<td>1-49</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Trauma pts should be taken directly to the TC most appropriately equipped and staffed to handle their injuries, as defined by the Region’s trauma system (below). EMS should bypass facilities not designated as appropriate destinations, even if those facilities are closest to the incident (ACS-COT, 2014). See appendix for listing of all TCs in Regions 8, 9, & 10. If local agency concerns oppose using these triage & transport criteria, EMS personnel should contact OLMC for orders.

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

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

### Step 1

<table>
<thead>
<tr>
<th>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 (assoc w/ head trauma)</td>
<td>14 - 15</td>
<td>14 - 15</td>
<td>Traumatic arrest</td>
</tr>
<tr>
<td><em>Systolic BP</em></td>
<td><em>&lt; 90 (adults) / &lt;70 (peds)</em></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>

### Step 2: Anatomic Criteria

- **Head/neck trauma**
  - All penetrating skull/eyes/neck
    - Open or depressed skull fx
  - Blunt: GCS 13 or less
  - Blunt: GCS 14-15
  - Blunt: GCS 14-15

- **Spinal cord injury**
  - Paralysis
  - All penetrating SCI
  - Suspected isolated SCI; hemodynamically stable

- **Chest/back**
  - All penetrating (superficial or deep)
  - Tension pneumothorax
  - Chest wall instability or deformity (flail chest)
  - Blunt & hemodynamically stable

- **Abdomen/Groin/Pelvis**
  - All penetrating (superficial or deep)
  - Blunt w/ *hemodynamic instability*
  - Blunt & hemodynamically stable

- **Extremities/Vascular**
  - 2 or more proximal long bone Fx; unstable
  - Penetrating proximal to elbow or knee
  - Crushed, degloved, mangled, pulseless limb
  - Amputation proximal to wrist or ankle:
  - 2 or more proximal long bone Fx - stable
  - Amputation distal to wrist or ankle
  - Penetrating injury distal to elbow/knee
  - Single long bone injury and hemodynamically stable

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

- **Falls:** Adult ≥ 20 ft (one story = 10 ft) Children <15 years: >10 ft or 2-3 times their height
- **High risk auto crash**
  - Intrusion (including roof) > 12 inches at occupant site or > 18” any site
  - 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

DHHS & CDC. (2012). Guidelines for field triage of injured patients, recommendations of the National Expert Panel on Field Triage, MMWR 61(RR-1), 1-20 Available at: [www.facs.org/quality-programs/trauma/vrc/resources](www.facs.org/quality-programs/trauma/vrc/resources).
**Definition:** Trauma patient found unresponsive, apneic or gasping and pulseless who does not meet criteria for Triple Zero or non-initiation of CPR policies

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

2. **Complete ITC ENROUTE** as time and number of EMS personnel permits:

3. Victims of submersion, lightning strike and hypothermia deserve special consideration as they may have an altered prognosis. See appropriate SOP.

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**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 Lead ECG If pt has S&S that could be cardiac in nature, is elderly, or has hx of CVD or drug use
   - VS; Assess for hyperthermia; volume depletion; tachycardia (hypersympathetic state); metabolic acidosis
   - IV NS to correct volume depletion if present
   - SAMPLE Hx: Date of last tetanus prophylaxis; cardiac hx; ingestion of mind altering stimulants (PCP, cocaine)
   - Rapid secondary assessment: Tased individuals can have injury or illness that occurs before taser event and/or injury when they are tased and fall
     - Assess for excited delirium: agitation, excitability, paranoia, aggression; great strength; numbness to pain; violent behavior. Apply/maintain restraints if needed
   - Severe anxiety and SBP ≥ 90 (MAP ≥ 65): **MIDAZOLAM** 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg titrated to response. If IV unable/IN contraindicated: IM 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose. All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
     - If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
   - Identify location of and **care for PROBES per local procedure**
     - If probe becomes disengaged: Handle as a sharp; check with local law enforcement to see if they require that probes be kept as evidence; if no place directly in a designated sharps container
     - Cleanse puncture sites and bandage as appropriate
   - Transport for further evaluation
   - If pt is decisional and refuses treatment and/or transport, advise to seek medical attention immediately if they experience any abnormal S or S.
   - If patient has not had tetanus immunization in the last 10 yrs, advise to acquire it
   - Provide disclosure of risk and obtain signature on refusal form. Contact OLMC from point of patient contact.
1. ITC special considerations: (Scene/responder safety top priority)
   - Stop burning process/further injury: Remove pt from source. Cool per thermal wound care next page.
   - Remove clothing, constricting jewelry; belts, suspenders, steel toed shoes (retain heat).
   - Do not pull away clothing stuck to skin (cut around).
   - Keep burn as clean as possible; wear gloves/mask until burns covered.
   - Quantify oxygenation (SpO₂), ventilation, perfusion, shock (ETCO₂ if available).
   - Airway: compromise, hoarseness, wheezing? Access may be difficult w/ burns of face or anterior neck.
   - HOB elevated to decrease airway edema.
   - If circumferential torso burn, monitor chest expansion closely.

   - Indications for IV/IO - % TBSA: Adults > 20%; Children > 15%; shock; need for IV meds
     - May start through burned skin if needed; infuse warm fluid.
     - If in shock: Initial NS IVF: ≤5 yrs: 125 mL/hr 6-13 yrs: 250 mL/hr ≥14 yrs: 500 mL/hr
   - Document total amount of IV fluid infused by EMS; report to receiving facility.

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

   - Pain: Document severity; FENTANYL; Nausea: ONDANSETRON prn

   - Assess depth: Pain, swelling, skin color, capillary refill, moisture, blisters, hair loss, appearance of wound edges, foreign bodies, debris, contaminants, bleeding/soft tissue trauma. Note as superficial, partial, or *full thickness

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

   - Obese pts: Trunk may be up to 50% of TBSA, each leg up to 20%. Head & arms smaller % than by Rule 9s.

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

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

   - Assess for multi-system trauma; treat associated injuries. Circumferential burns to torso/limbs dangerous due to potential vascular and ventilatory compromise; careful ongoing assessments of distal perfusion.

   - Transport per Trauma Triage Guidelines

   - Rule of Nines

   - Full thickness S&S: White, pale, brown, waxy, leathery, or charred; dry (sweat glands destroyed); no capillary refill; NO pain in area of FT damage (sensory nerves destroyed) hair sloughs (hair follicle destroyed); thrombosed vessels may be seen through the translucent skin surface; coagulated dead skin forms a tough, leathery eschar.
THERMAL
2. **WOUND CARE per System protocol**
   - **COOL** PT burns <10% or FT burns < 2% with water or NS for 10 min; do not apply ice
   - **Minimize contamination:** Cover burns with plastic wrap to ↓ air movement over burn; ↓pain; reduce fluid loss; & prevent hypothermia and prevent contamination; apply dry sterile dressings or other agents per System policy. Smaller burns < 5% or eyelids may have moist dressings.
   - Do not break blisters, debride skin, or apply topical ointments, creams, or anti-microbials in the field
   - Wrap digits individually or place gauze between burned skin areas
3. Prone to hypothermia: Keep warm - Anticipate shivering and temp loss in burns > 20% TBSA.
   - Open burn sheet on stretcher before placing pt. Cover pt with clean dry sheet and blanket; place in warm environment ASAP

INHALATION
2. Assess for stridor, wheezing, carbonaceous (black) sputum, cough, hoarseness, singed nasal or facial hair, dyspnea, burns, edema or inflammatory changes in oral pharynx/upper airway
3. **O₂ 15 L/NRM or BVM; monitor ECG- Consider need for advanced airway**
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 Lead ECG if available); treat dysrythmias and/or tonic clonic seizures per appropriate SOP
   - Anticipate respiratory arrest/paralysis of respiratory muscles if pulse is present; assist ventilations prn
   - IVF: 2-4 mL X kg X %TBSA burned = ½ in 1st 8 hrs
4. Attempt to locate contact points (entry and exit wounds). Describe appearance of wounds (often full thickness);
   - No cooling needed unless an associated thermal burn; Apply dry, sterile dressings.
5. Assess for potential associated trauma from being thrown from contact point; note neurovascular function all limbs.
   - Assess for potential compartment syndrome; selective spine motion restriction per SCI SOP
6. **Event hx:** Identify nature of the electrical source (AC vs DC), voltage, amperage and duration of exposure if known;
   - position of pt. in relation to electrical source; downtime in cardiac arrest

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

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


**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 hemotherax, cardiac tamponade, blunt cardiac injury, thoracic aortic injury, tracheal or bronchial tree injury, diaphragmatic tears, blast injuries

   **Level I trauma center if transport time 30 minutes or less:**
   - All penetrating chest trauma or blunt trauma with hemodynamic instability
   - Tension pneumothorax; chest wall instability or deformity (flail chest)
   **Nearest Level I or II trauma center:** Blunt chest trauma & hemodynamically stable

2. **TENSION PNEUMOTHORAX**
   - Extreme dyspnea, unilateral absence of lung sounds, SBP < 90 (MAP < 65); JVD, resistance to BVM ventilations, ↑ airway resistance, subcutaneous emphysema
   - Needle pleural decompression on affected side while on scene) with OLMC contact (takes priority over airway)
   - Frequently reassess catheter patency. May need to repeat procedure with additional needle.
   - Continue ITC enroute; implement other protocols as required.
   - Monitor for PEA: Treat per SOP.

3. **OPEN PNEUMOTHORAX** (Sucking chest wound)
   - 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); Vaseline gauze, 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
   - If impaled object: Do not remove; continue ITC enroute; implement other protocols as required

4. **FLAIL CHEST** (+/- paradoxical chest movement; anticipate pulmonary contusion – SpO₂ < 90%)
   - 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
   - If ventilatory failure or persistent hypoxia despite above: intubate (DAI) & ventilate w/ 15L O₂/BVM at 10 BPM
   - Monitor for tension pneumothorax; prepare to perform needle pleural decompression
   - 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.

5. **PERICARDIAL TAMPOONADE**
   - SBP < 90 (narrowed pulse pressure) (MAP < 65); JVD; muffled heart tones. Lung sounds are usually present bilaterally.
   - Permissive hypotension NS IV WO while enroute just to achieve SBP 80. Additional IVF per OLMC.
   - Monitor for PEA: Treat per Traumatic Arrest SOP

6. **BLUNT Aortic and CARDIOVASCULAR INJURY**
   - Pathology ranges from clinically silent, transient dysrhythmias to deadly injuries including but not limited to, cardiac wall rupture, cardiac contusion, septal and valvular injury, injury to thoracic aorta, myocardial infarction/dysfunction; & lethal dysrhythmias.
   - **Aorta:** May have no external S&S of chest trauma. Suspect with rapid deceleration; assess for chest pain, intrascapular pain, difficulty breathing or swallowing; upper extremity HTN, bilateral femoral pulse deficit
   - **Blunt cardiac injury:** Chest wall bruising, sternal, clavicular or rib fx; S&S cardiogenic shock; ECG/12 L abnormal if unexplained ST, ventricular arrhythmia, atrial arrhythmia (multi-formed PACs or new AF/flutter; right BBB, new onset Q waves/St-T wave abnormality)
   - 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. Severe pain unrelieved by Tetracaine or Tetracaine contraindicated. FENTANYL

CHEMICAL SPLASH / BURN: TRUE EMERGENCY

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

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

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

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

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

1. ITC special considerations:
   - Assess need for selective spine precautions; PMH for blood thinners; control exterior bleeding.
   - Clear oral cavity of F/B and gross debris. Allow pt to assume position that allows for patent airway (sitting or side lying so blood/secretions drain from nose & mouth); avoid aspiration/swallowing blood; suction prn; no nasal airways; 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 per Musculoskeletal SOP (if possible)
   - Vomiting/aspiration precautions: ONDANSETRON [BLS/ALS]
   - IV access for IVF, pain meds, or ondansetron (more likely)
   - Apply cold packs over injury site; severe pain: FENTANYL
2. Avulsed tooth: Avoid touching root, pick up by crown; do not wipe off, if dirty rinse under cold water for 10 sec. Place in milk, saline, or commercial tooth preservative solution. Unrecovered teeth may be aspirated. If GCS 15, may hold tooth in mouth for transport.
3. Mandible fx: Cannot open/close jaw, spit/swallow effectively; malocclusion/sublingual hematoma: no chin lift; aspiration risk
4. Maxillary fx (LeForts): Anticipate nasal bone/anterior basilar skull fx;
**HEAD TRAUMA / Traumatic Brain Injury**

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

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

### 1. ITC special considerations:
- Selective spine precautions if indicated
- Mod to severe injury: Continuous SpO₂ monitoring; prevent/correct hypoxia ASAP; ensure adequate ventilations

**DO NOT OVERVENTILATE:** Assist/ventilate at 10 BPM prn; maintain ETCO₂ at 35-40 (if available)

*Do not intubate unless unable to ventilate and oxygenate using position, BLS or alternate advanced airways*

- Vomiting precautions. **ONDANSETRON** prn [BLS/ALS]; limit suction to 10 sec; oxygenate before & after procedure
- **Scalp wounds:** No unstable fracture: direct pressure, dressings; Unstable fx: hemostatic dressings, avoid direct pressure
- **12-lead ECG** if dysrhythmia present: PACs, SB, SVT, PVCs, VT, Torsades, & VF.
  - SAH. Pathological Q waves, ST elevation or depression; prolonged QTc, wide, large & deeply inverted (neurogenic or cerebral) T waves; prominent U waves > 1 mm amplitude common causing incorrect suspicion of myocardial ischemia.
- Attempt to maintain cerebral perfusion pressure (CPP): **Avoid/correct all hypotension ASAP**
  - If GCS ≤ 8: Keep head of bed flat; no permissive hypotension in multi-system trauma w/ TBI
  - NS IVF boluses (200 mL increments up to 1 L); target SBP 110-120 (MAP 85-90) or higher
- **If generalized tonic clonic seizure activity present:** MIDAZOLAM standard dose for seizures
- **AMS:** Obtain and record blood glucose level per local procedure (capillary and/or venous sample)
  - If < 70: treat per Hypoglycemia SOP

### 2. Neuro exam - Establish patient reliability
- Patient must appear calm, cooperative, alert, and perform cognitive functions appropriately with NO AMS, acute stress reaction, brain injury, chemical impairment causing altered decisional capacity, distracting painful injuries, and language or communication barriers.
- Rapid neuro exam for evidence suggesting traumatic brain injury
- Reassess at least q. 15 minutes; more frequently as able:
  - Mental status [arousal, orientation, memory (amnesia), affect, behavior, cognition]; GCS
  - Early S&S deterioration: confusion, agitation, drowsiness, vomiting, severe headache
  - Pupil size, shape, equality, reactivity; gaze palsy; visual changes/disturbances; light sensitivity, hearing deficits
  - BP (MAP); pulse pressure; HR; respiratory rate/pattern/depth; 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 palsy, oval pupil w/ hippus (pupils jiggle when light reflex checked); dilated, nonreactive pupils (unilaterally or bilaterally)

**ITC special considerations:**
- Maintain supine position with head in axial alignment
- Assess SpO₂: O₂ 12-15 L/NRM or BVM at 10 BPM. Monitor capnography (if available).
- Assess for signs of **brain shift**: Coma; dilated, nonreactive pupil(s); motor deficit; GCS drops by 2 or more points (<8)
  - If present: Seek OLMC order for **limited hyperventilation**: Adult: 17-20 BPM (must be guided by 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
MUSCULO-SKELETAL Trauma

1. **ITC special considerations:**
   - Assess pain, paralysis/paresis, paresthesias, pulses, pressure & pallor before & after splinting. Evaluate for obvious deformity, shortening, rotation, or instability.
   - **Analgesia before moving/splinting:** Hemodynamically stable, isolated MS trauma, no contraindications (drug allergy, AMS):
     - *NITROUS OXIDE* if available; *FENTANYL* for moderate to severe pain
     - Severe muscle spasm: Analgesia as above plus: *MIDAZOLAM* (anxiety dosing)
   - **Patients meeting 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 a traction splint: Do not release traction. Notify OLMC.

4. Acute injury: Apply **cold pack** over injury site and **elevate** extremity after splinting unless contraindicated.

### AMPUTATION / DEGLOVING INJURIES:

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

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

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

### CRUSH SYNDROME (CRITICAL)

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

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

6. If HR > 100, restless, ↑RR, wide QRS, long PR interval, or peaked T waves after above:
   - IV NS up to total of 3 L over 1st 90 minutes following release of compression unless contraindicated.
   - (Ensure clear lung sounds, no shortness of breath)

7. **Assess for compartment syndrome:** If present do not elevate or cool limb.

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

5. Never remove an impaled object unless it is through the cheek and poses an airway impairment, and/or it would interfere with (assisted) ventilations, chest compressions, or transport.

6. Stabilize object with bulky dressings; insert gauze rolls into the mouth to absorb excess blood.

7. Elevate extremity with impaled object if possible.

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

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

5. Prior to rescue: **Lift legs into a sitting position** if at all possible.

6. **ITC special considerations:**
   - Obtain baseline ECG before release if possible; continue ECG monitoring after release.
   - Start IV NS TKO prior to suspension release if possible. Run wide open after release up to 1 L.

7. Once released from suspension - **Do not allow pt to stand up or lie flat.** If conscious: Position sitting up with legs bent at the hips and knees for at least 30 min. If unconscious, place on side w/ knees drawn up to chest.

8. Treat dysrhythmias per appropriate SOP. If significant hyperkalemia suspected: Rx per Crush Syndrome.
Current science: No proven benefit of maintaining rigid spine immobilization with a backboard during EMS transport of a trauma pt. Use of a long board, short board or KED is NOT a benign procedure. A backboard can induce pain, agitation, and respiratory compromise, & decrease tissue perfusion at pressure points leading to pressure sores. Use during transport judiciously, so potential benefits outweigh the risks. A backboard or similar device may be useful to facilitate spine precautions during extrication. Time on backboards should be minimized. Securing a pt to a stretcher w/o a perfusion at pressure points leading to pressure sores. Use during transport judiciously, so potential benefits outweigh the risks. A backboard or similar device may be useful to facilitate spine precautions during extrication. Time on backboards should be minimized.

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

1. ITC special considerations: Assess pt in position found. Implement care by integrating both pages of spine trauma SOP.
   - Frequently reassess airway/ventilations (ETCO₂), ability to talk; muscles used to breathe.
   - Prepare to support ventilations if RR/depth diminishes & ventilatory failure imminent/present
   - Monitor for airway compromise or aspiration in immobilized pts w/ N / V or with facial/oral bleeding: **ONDANSETRON prn.**
   - Treat hypotension: IVF per ITC; keep adult MAP 85-90; assess for neurogenic shock (See next pg); protect paralyzed limbs
   - Prevent hypothermia: SNS disrupted w/ injury above T6; may have altered thermoregulation (poikilothermia)
   - Pain: Reduce standard dose by ½ - judicious use of opiates. Avoid resp. depression; preserve neuro function

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

3. Establish reliability: Must appear calm, cooperative, alert, and perform cognitive functions appropriately with NO AMS, acute stress reaction, brain injury, chemical impairment, altered decisional capacity, distracting painful injuries, language or communication barriers

4. Rapid neuro exam for evidence suggesting spine injury. (See notes next page)

5. Selective spine precaution guidelines: See below - Additional caveats:
   - Penetrating trauma to head, neck, or torso: No spine precautions
   - Ambulatory at scene or long transport time: apply c-collar and secure to firm padded surface (stretcher) w/o scoop or board
   - Stable pt/scenes; in vehicle and no injury: apply c-collar; adult / child in booster seat may self- extricate onto stretcher. Extricate smaller child while strapped in car seat.
   - Stable pts/scene; in vehicle with injury: KED (vest-type device) or short board to remove
   - Unstable location or pt: in vehicle: Rapid extrication (lift & slide onto long board); move to cot for evaluation
   - Children are abdominal breathers, place straps over chest/pelvis, not across abdomen. Heads are disproportionately large. Board should have recess for head or elevate torso 1-2 cm to avoid neck flexion when immobilized.
   - If extricated onto a backboard: **KEEP ON padded board** w/ full spine precautions if: unreliable; distracting injury, C/O spine pain, tenderness to palp; pain on movement; spine deformity; new onset paralysis/paresis, or abn sensory exam. **If none of these exist: remove from board.**

6. If nonresponsive to verbal efforts to calm them or uncooperative in remaining still:
   - Restrain prn per system policy/procedure. Document reasons for use.
   - **Assess need for sedation:** If no loss of consciousness or resp depression; SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM** (anxiety dosing)

---

**Mechanism of injury**

**NEGATIVE**

**No spine precautions needed**

**UNCERTAIN or POSITIVE**

- **Assess RELIABILITY**
  - GCS 15; A&O X 4
  - Calm, sober
  - Obey commands

- **c/o Pain?**
  - Denies pain; no extremity fx / distracting injury

- **PALPATE**
  - No tenderness or anatomic abnormality

- **MOTOR & SENSORY**
  - Abnormal exam

- **WNL**

**Spine precautions needed**

No spine precautions indicated
Positive (+) mechanisms resulting in higher risk for injury
- MVC: Intrusion > 12 in. occupant site or > 18 in any site; vehicle telemetry data consistent with high risk of injury motorcycle crash > 20 mph
- Ejected (partial or complete) from vehicle; death in same passenger compartment
- Falls: adult ≥ 20 ft (one story = 10 ft); elderly ≥ 65 (all falls); Children aged < 15 yrs: > 10 ft or 2-3 times their height.
- Auto v. pedestrian/bicyclist thrown, run over, or with significant (> 20 mph) impact (All elderly)
- Penetrating injury to neck or near the spine; diving injury

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

Negative mechanisms requiring no spine precautions
- Non-traumatic back pain or back spasm; isolated extremity trauma not involving the head or spine

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

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

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

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 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)

NEUROGENIC SHOCK (CRITICAL): Distributive shock due to loss of sympathetic tone seen in high level paraplegia (T1-T4) or tetraplegia resulting in SBP < 90 (vasodilation); HR < 60 (unopposed Vagal tone); skin warm/dry below injury; ETCO2 31 or less. Consider other causes of hypotension in an acute trauma pt including: hemorrhage, tension pneumothorax, myocardial injury, pericardial tamponade

- NS IVF challenges in consecutive 200 mL increments up to 1 L to achieve/maintain SBP ≥ 90 (MAP≥ 65) Repeat BP assessments after each 200 mL and reassess lung sounds. Avoid fluid overload.
- ↓ HR & BP persist: ATROPINE 0.5 mg rapid IVP (Peds: 0.02 mg/kg IV/IO minimum 0.1 mg; max adult dose) May repeat q. 3 minutes to a max dose for age: Adult: 3 mg IVP / Peds 2 mg.
- ↓ BP persists: DOPAMINE IVPB: 5 mcg/kg/min; may titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥65)
### 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>Small scale incident</th>
<th>Medium to large scale incident</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/trigger</strong></td>
<td><strong># of pts, nature of injuries, and resources that can arrive at scene w/in 15 minutes (secondary response time) make normal level of EMS care achievable for most seriously injured</strong>&lt;br&gt;<strong>All time-sensitive patients can be transported within a 10 min scene time.</strong>&lt;br&gt;<strong>“Business as usual” - within scope of normal operation</strong></td>
</tr>
<tr>
<td><strong>Triage required</strong></td>
<td>YES – all persons on scene; using START/JUMPstart</td>
</tr>
<tr>
<td><strong>Triage tags</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>PCR/EHRs</strong></td>
<td>Mandatory</td>
</tr>
<tr>
<td><strong>Pt distribution; usual transport patterns</strong></td>
<td>Apply</td>
</tr>
<tr>
<td><strong>Trauma Center criteria</strong></td>
<td>Apply</td>
</tr>
<tr>
<td><strong>OLMC when transporting</strong></td>
<td>Mandatory</td>
</tr>
<tr>
<td><strong># in pt compartment + EMS responder</strong></td>
<td>1 ALS + 1 BLS or 2 BLS if no HIPAA violation</td>
</tr>
<tr>
<td><strong>Refusal process</strong></td>
<td>Applies</td>
</tr>
</tbody>
</table>

1. **Scene size up:** Determine if additional help is needed<br>**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.<br>**EMS Responder #2:** Begin triaging all patients using Start/JUMPstart<br><br>2. **First arriving EMS personnel/officer/acting officer becomes initial IC and establishes scene command.** Determines scale of incident (small, medium-large), builds resources, makes assignments; deploys ID vests if escalates/mutual aid involved to ID key personnel.<br>**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 pm
- 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.
HAZARDOUS MATERIALS INCIDENTS

1. Scene safety:
   - If hazard is suspected, approach site with extreme caution, position personnel, vehicles, and command post at a safe distance (200-300 ft) upwind of the site.
   - Protect emergency responders: PPE including respiratory protection. Standard bunker gear with SCBA provides 3-30 min of protection from nerve agents. Chemical protective clothing should be worn when local and systemic effects of possible agents are unknown. www.atsdr.cdc.gov/MHM/mmg170.html
   - Identify all potentially exposed victims and do not allow them to leave the scene.

2. Scene size up:
   - Consider dispatch information (multiple persons seizing or having difficulty breathing)
   - Does scene look routine? Anything unusual? Vapor clouds or mists? Look for obvious area impacted.
   - Establish hot & warm zones & perimeters Isolate/secure area by establishing boundary of the contaminated area and a non-contaminated buffer area. Consider need for immediate evacuation of downwind populations.
   - Identify the agent; gather information about the incident if possible.

3. Send info
   - Relay size up information to appropriate agencies and personnel ASAP.
   - Consider need for assistance: notify Haz Mat teams ASAP. State & Local governmental agencies - may need water control, natural resources and public utilities for full response.
   - Notify receiving hospital(s) ASAP. Notify Resource Hospital if mass casualty incident.
   - Activate Regional EMS Disaster plan.

4. Use National Incident Management System (NIMS): Set up the medical group
   - Initiate command-based decisions regarding the need for additional EMS personnel and patient triage.

5. Initiate Start (JumpSTART) triage
   - Prepare personnel and equipment for entry into the contaminated area
   - If possible radiation: Enter contamination zone using a radiation detector (alpha, beta gamma), survey meter, and pencil or thermo luminescent dosimeters if immediately available to measure radiation levels.
   - Triage as soon as feasible, knowing that decon may need to be in place first.

6. Treatment
   - Rescue victims if possible; provide life-saving care in the hot zone and move pts to the warm zone for further treatment and monitoring. Treat all patients as contaminated until proven otherwise.
   - ITC: Counter poisons w/antidotes & supportive care; follow appropriate SOP if time and personnel allows.
   - If possible nerve gas incident: See CHEMICAL AGENTS SOP.
   - If dermal chemical exposure: Determine decontamination needs: establish decon area; avoid cross-contamination; decontaminate pts/rescuers
   - Cover open wounds with dressings and roller bandage. Do not use tape.

7. Contact OLMC
   - Location of incident and number of victims
   - Medical status of victims if known
   - Source and nature of contamination/exposure
   - Route of contamination: external or internal (ingestion/inhalation)
   - Need for decontamination at hospitals
   - Request directions from receiving hospital for victim decontamination entry point.

8. Confine contamination for transport:
   - Confine radiologic contamination. Transport contaminated victims by positioning a clean stretcher on the clean side of the control line with a clean sheet to receive and cover the victim. Tuck the clean sheet around the patient to reduce risk of contaminating the ambulance.
   - Rescuers should remove outer protective clothing/gloves and don clean gloves for handling patient enroute.
   - Cover floor of ambulance with a securely taped sheet or paper to ↓ possibility of contaminating ambulance.

9. Decontamination at hospital: If radioactive exposure: Rescue personnel should be thoroughly surveyed for contamination. Victims' clothing and rescuers' contaminated protective outer clothing should be bagged, labeled "Radioactive - DO NOT DISCARD", and left at the control area. Shower as appropriate under the direction of the radiation safety officer. Lock the ambulance until it can be monitored for contamination.

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

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

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

### Cholinergic S&S:
- Salivation/sweating, 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/ 2 hrs of vapor exposure, tearing, itching, CNS effects (lethargy, sluggishness, and apathy), respiratory failure.


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

### Hot zone - severe exposures

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

<table>
<thead>
<tr>
<th>Patient age/size</th>
<th>Mild: Unexplained runny nose, tightness in chest, SOB, bronchospasm w/ wheezing</th>
<th>Severe symptoms</th>
<th>Coma, paralysis, cyanosis, apnea, seizures***</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infant (&lt; 7 kg)</strong></td>
<td>Atropine 0.25 mg IM &amp; *15 mg/kg IM</td>
<td>Atropine 0.5 mg IM &amp; *25 mg/kg IM</td>
<td></td>
</tr>
<tr>
<td><strong>Infant (7-13 kg)</strong></td>
<td>Atropine 0.5 mg IM &amp; *15 mg/kg IM</td>
<td>Atropine 1 mg IM &amp; *300 mg IM</td>
<td></td>
</tr>
<tr>
<td><strong>Child (14-25 kg)</strong></td>
<td>Atropine 1 mg IM &amp; *300 mg IM</td>
<td>Atropine 2 mg IM &amp; *600 mg IM</td>
<td></td>
</tr>
<tr>
<td><strong>Child (26-40 kg)</strong></td>
<td>Atropine 2 mg IM &amp; *600 mg IM</td>
<td>Atropine 4 mg IM &amp; *1200 mg IM</td>
<td></td>
</tr>
<tr>
<td><strong>Adult/Child ≥ 88 lbs (40 kg)</strong></td>
<td>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</td>
<td>3 Mark I kits or DuoDote injectors in rapid succession OR **Atropine 6 mg IM and *2-PAM: 1800 mg IM</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GUIDELINES
1. Response and staging: Initial responding EMS teams shall stage at safe locations out of the line-of-sight and away from the scene. Non-transport vehicles (not being used as RTFs) should block roads leading to the scene when PD or Public Works (PW) vehicles are not available. Drivers of these vehicles shall remain with their vehicles and watch for responding emergency personnel and move the vehicles as needed.
2. As quickly as possible, establish Incident Command (IC) and Unified Command (UC) per local policy.

3. Communications
   - Between FDs/EMS: Use MABAS frequencies
   - Between FDs & PD: Use police-band radio that allows FD IC to monitor radio traffic. If PD is operating in “radio silence”, FD shall not transmit over the radio

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

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

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

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

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

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

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

11. Tactical EMS (TEMS) personnel shall operate under specific local policies and procedures that should be amended to these SOPs/SMOs.
**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
- Diarrhea
- Respiratory insufficiency or distress
- Pharyngitis (sore throat)
- Swollen lymph nodes
- Blurred or double vision
- Muscle paralysis
- Skin lesion that look like small pox
- Malaise
- Cough

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

  **CDC website:** [www.CDC.gov](http://www.CDC.gov)  800-CDC-INFO (800-232-4636)  TTY: (888) 232-6348

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

**IEMA phone contacts**

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

See charts in Appendix for more detail (pp. 107-109)
Persons protected by the Illinois Domestic Violence Act of 1986 include:

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

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

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

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

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

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

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

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

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

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

IDPH ABUSE HOTLINE: 1-800-252-4343
Department of Aging: 866-800-1409
TRAUMA IN PREGNANCY

1. ITC special considerations: Same immediate priorities. Pregnancy does not limit or restrict any resuscitative Rx.
   - Stabilize mom first as fetus's life depends on the mother's. Mom may compensate at the expense of the fetus. Baby may be in jeopardy while mom appears stable.
   - Upper airways are congested due to increased blood and swollen capillaries. Support airway as needed.
   - O₂ 12-15 L by tight fitting mask even w/o respiratory distress 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 as necessary – permissive hypotension contraindicated (maintain SBP >90; MAP ≥65 ).
   - If spine precautions indicated and gestational age > 20 weeks: Tilt patient to either side by raising the side of the board and supporting board with blanket rolls. Manually displace uterus to side. Avoid Trendelenburg position.
   - Take BP while mother is seated or tilted towards side if gestational age > 20 wks.
   - Pain management – Fentanyl: Category C – Consult with OLMC. The potential benefits to the mother must be balanced against possible hazard to the fetus.

2. Serial abdominal exams: Note abdominal shape & contour
   - Inspect for deformity, contusions, abrasions, punctures, and wounds
   - Attempt to auscultate fetal heart tones (FHTs) or assess fetal activity per policy if > 20 wks - Ave. 120-160/min.
   - Palpate abdomen to determine uterine tenderness/irritability & fundal height. Fundus is level w/ navel at 20 wks with one baby. Assess rigidity of uterus vs. abdominal wall, leakage of amniotic fluid (presence of meconium/blood), presence/absence of fetal movements.
   - If contractions present: Assess duration, frequency, strength; pain scale; check for imminent delivery.
   - Vaginal bleeding: May be earliest sign of placental separation, abortion or preterm labor; May indicate injury to GU tract. Note presence, amount, color, consistency of blood. Do not pack vagina.
   - If bag of waters ruptures in your presence: evaluate color, consistency, odor, quantity of fluid. Port wine: abruptio placenta; green: meconium; foul smelling: infection; assess for prolapsed cord.

3. Prepare to deliver if signs of imminent birth are present.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal</th>
<th>Changes in pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood volume</td>
<td>4-5 L</td>
<td>Increased 40-50%; May NOT show S&amp;S of shock (VS changes) 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 nml 3rd trimester</td>
</tr>
<tr>
<td>Cardiac output</td>
<td>4-5 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: Maternal hyperventilation nml (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 following trauma. Highest risk in moms with injuries to thorax, abdomen, and pelvis
- Prime causes of fetal death d/t trauma: placental abruption (50-80%); maternal death (~10%); maternal hypovolemic shock (<5%)
- 60% - 70% of fetal deaths occur following minor maternal injuries.
- Risk for fetal injury highest in 3rd trimester when head is engaged, torso exposed, & ratio between fetus & amniotic fluid is lowest
- Peripheral vasodilation causes ↑ peripheral circulation in 1st & 2nd trimesters. Pt in shock may be warm and dry.
- Maternal shock causes uterine vasoconstriction that ↓ blood flow to fetus by 20% - 30% before BP changes in mom.
- Will see changes in fetal HR pattern if FHTs can be assessed.
- Stretched abd wall masks guarding, rigidity, & rebound tenderness. Palpation exam unreliable in trauma. Less able to detect abdominal bleeding clinically. Bladder vulnerable to rupture w/ direct trauma to suprapubic area.

Appendix in RUQ in late pregnancy due to upward shifting of abdominal organs.
PHASE I: LABOR

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

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

3. Inspect for S&S imminent delivery: bulging/crowning during contraction, involuntary pushing, urgency to move her bowels
   - IF DELIVERY NOT IMMINENT: Allow pt. to assume most comfortable position; transport to hospital w/ OB services
   - IF DELIVERY IS IMMINENT: (contractions 2 min apart or less, or any of the above are present)
     - Do not attempt to restrain or delay delivery unless prolapsed cord is present.
     - Provide emotional support; mom is in pain and may not cooperate
     - Position semi-sitting (head up 30°) w/ knees bent or on side on a firm surface, if possible.
     - Wash hands w/ waterless cleaner. Put on FULL BSI. Remove clothing below her waist if able.
     - Open OB pack; maintain cleanliness of contents; place absorbent materials beneath perineum and drapes over abdomen, each leg, & beneath perineum. Prepare bulb syringe, cord clamps, scalpel, and chux to dry and warm infant. Ready neonatal BVM, NRM, resuscitation equipment, and O₂ supply. Prepare neonatal warmer if available.

PHASE II: DELIVERY

1. HEAD: Allow head to deliver passively.
   - Control rate of descent by placing palm of one hand gently over occiput.
   - Protect perineum with pressure from other hand.
   - If amniotic sac still intact, gently twist or tear the membrane.

2. After head is delivered:
   - No meconium: Do not suction during delivery to avoid Vagal stimulation and fetal bradycardia.
   - Meconium present: Gently suction mouth then nose w/ bulb syringe.
     Anticipate need for resuscitation of a nonvigorous infant after delivery.
   - Feel around neck for the umbilical cord (nuchal cord). If present, attempt to gently lift it over baby's head. If unsuccessful, double clamp and cut cord between the clamps.
   - Support head while it passively turns to one side in preparation for shoulders to deliver.

3. SHOULDERS:
   - Gently guide head downwards to deliver upper shoulder first
   - Support and lift the head and neck slightly to deliver lower shoulder.
   - If shoulder dystocia: Gently flex mother’s knees alongside her abdomen.
     Attempt to rotate anterior shoulder under symphysis pubis.

4. The rest of the infant should deliver quickly with next contraction.
   - Firmly grasp infant as it emerges. Baby will be wet and slippery.

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

<table>
<thead>
<tr>
<th>APGAR Assessment</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (color)</td>
<td>Blue or pale</td>
<td>Blue hands or feet</td>
<td>Entirely pink</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 is torn and/or bleeding, apply direct pressure with sanitary pads and have patient bring her legs together. Apply cold pack (ice bag) to perineum (over pad) for comfort and to reduce swelling.
4. If blood loss > 500 mL: or S&S of shock/hypoperfusion:
   - IV NS fluid challenges in 200 mL increments titrated to patient response
   - Massage top of uterus (fundus) until firm
   - Breast feeding may increase uterine tone. (Do not transport with baby breastfeeding)
5. If blood loss continues despite above with SBP < 90 (MAP < 65); transport ASAP; alert OLMC
## DELIVERY COMPLICATIONS

### BREECH BIRTH

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

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

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

### Delivery Procedure

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

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

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

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

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

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

### PROLAPSED CORD

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

1. **IMC special considerations:** 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.
3. Apply saline moistened sterile towels or dressings around uterus.
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.
- **Acrocyanosis**, blue discoloration of the distal extremities, is a common finding in the newly born infant. Differentiate from central cyanosis.
- **Periviable birth** (Delivery between 20 - 26 wks of gestation): Factors that influence survivability: gestational age; birth weight; gender (female), singleton birth, use of antenatal steroids.

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

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

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

<table>
<thead>
<tr>
<th>Targeted SpO₂ after birth</th>
<th>1 min</th>
<th>60%-65%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 min</td>
<td>65%-70%</td>
</tr>
<tr>
<td></td>
<td>3 min</td>
<td>70%-75%</td>
</tr>
<tr>
<td></td>
<td>4 min</td>
<td>75%-80%</td>
</tr>
<tr>
<td></td>
<td>5 min</td>
<td>80%-85%</td>
</tr>
<tr>
<td></td>
<td>10 min</td>
<td>85%-95%</td>
</tr>
</tbody>
</table>

**BRADYCARDIA** (HR < 100 beats per minute)
5. **If apneic/gasping respirations, RR < 40 or central cyanosis** Continue to **ventilate at 40-60/neonatal BPM**, add **15 L 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. ⅔ 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>
<tr>
<td>2 kg = 10 mL</td>
<td>3 kg = 15 mL</td>
<td>4 kg = 20 mL</td>
<td>5 kg = 25 mL</td>
</tr>
</tbody>
</table>

If hypoglycemic; **D₁₀W 0.5 m/kg (5 mL/kg)**
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
     - Ask about the onset, provocation, quality, region, radiation, severity, and duration of abdominal pain

2. Complete serial abdominal exams per OB Trauma SOP
3. Note type, color, amount, and nature of vaginal bleeding or discharge
   If tissue is passed, collect and transport to hospital with patient
4. See notes on bleeding/shock in OB Trauma SOP

PRE-ECLAMPSIA OR HYPERTENSION OF PREGNANCY

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

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

2. **MAGNESIUM** (50%) 2 Gm in16 mL NS (slow IVP) or in 40 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.
   Anticipate seizures; prepare suction

   If generalized tonic clonic seizure activity (ECLAMPSIA):

3. **MAGNESIUM** (50%) 2 Gm in16 mL NS (slow IVP/O) or in 40 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/O q. 30-60 sec (0.2 mg/kg INJ) up to 10 mg IVP/O/IN titrated to stop seizure.
   If IV/O 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 pm 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>Newborn: Neonate in first minutes to hours following birth</th>
<th>Infant: Neonates to 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neonate:</strong> Infant in the first 28 days of life</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Child:</strong> 1 to 12 years</td>
<td></td>
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</tr>
</tbody>
</table>

**Special considerations**

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

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**Pediatrics Initial Medical Care**

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

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

2. **PRIMARY ASSESSMENT/RESCUSCITATION:** establish rapport with patient/significant others

   - **General impression:** age, gender, preferred position, purposeful movements
   - **Pediatric assessment triangle:** General appearance; work of breathing; circulation to the skin
   - Observe response to environment (recognize parents/pets/toys), obvious respiratory distress or extreme pain, odors, muscle tone (good or limp), movements (spontaneous/ purposeful), irritable, consolable/non-consolable
   - Estimate size using a length-based tape (Broselow or equivalent)
   - Determine if immediate life threat exists and resuscitate as found
   - **Level of consciousness** using AVPU or Peds GCS; chief complaint S&S
   - **If unconscious, apneic or gasping, & pulseless** START QUALITY CPR – see appendix

   - **AIRWAY:** snoring, gurgling, stridor, silence; consider possible spine injury
     - Initiate selective spine precautions if indicated; vomiting/seizure precautions
     - Reposition; suction prn using size-appropriate catheter; appropriately-sized airway adjuncts.
     - Limit suction application to 5 sec. Monitor ECG for bradycardia during procedure.
     - If child is intubated: Max suction of -80 to -120 mmHg; higher suction pressures OK for mouth/pharynx
     - **If Obstructed:** Go to AIRWAY OBSTRUCTION SOP
     - Vomiting and seizure precautions as indicated

   - **BREATHING/gas exchange/adequacy of ventilations:** Assess/intervene as needed:
     Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing), position, air movement, symmetry of chest expansion; accessory muscle use (nasal flaring); retractions, head bobbing, expiratory grunting. Lung sounds if in ventilatory distress.
     - **SpO2** if possible hypoxia, cardiorespiratory or neurological compromise. Note before & after O2 if able.
       - Clinical recognition of hypoxia may not be reliable. SpO2 unreliable in pts w/ poor peripheral perfusion, CO poisoning or 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 \( \text{SpO}_2 \): 94%-98%

- \( \text{O}_2 \) 1-6 L/Peds NC: Adequate rate/depth; minimal distress; \( \text{SpO}_2 \) 92%-94%
- \( \text{O}_2 \) 12-15 L/Peds NRM: Adequate rate/depth: mod/severe distress; \( \text{SpO}_2 \) < 92%
- \( \text{O}_2 \) 15 L/Peds BVM: Apnea and/or shallow/inadequate rate/depth with mod/severe distress; unstable
  Ventilate 1 breath every 3 to 5 sec; just to cause visible chest rise.

### CIRCULATION / PERFUSION / HYDRATION / ECG:

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

**Conditions requiring rapid cardiopulmonary assessment and potential cardiopulmonary support**:  
- **Monitor ECG if unstable**. Standard size electrodes/defib pads may be used in children > 10 kg. (Use largest size that fits chest wall w/o touching with 3 cm between them). Prepare peds defib paddles if no pads.
- **Peds ECG**: PR & QRS intervals are shorter
  Be alert for conduction abnormalities in what looks like “normal” intervals or complex durations in young children. T waves normally inverted V1-V3 up to 8 yrs.
  **Consider need for peds 12 L ECG**: based on chief complaint or PMH: same criteria as adults

ALS patients do not necessarily require ongoing ECG monitoring or transmission of a strip to OLMC.
If ECG is run, attach/append to PCR/EHR left at, faxed to, or downloaded to, the receiving facility.

- **Treat rate/rhythm/pump/volume/volume distribution disorders per appropriate SOP**.
  Most peds arrhythmias caused by hypoxemia, acidosis, or hypotension.

**Vascular access**: Actual/potential volume replacement and/or IV meds prior to hospital arrival
- **0.9% NS** – Catheter size, access site, & infusion rate based on pt size, hemodynamic status; SOP or OLMC

Peripheral IV challenging in infants/children during emergency – may use IO if unresponsive.
Limit time spent establishing peripheral venous access in critically ill or injured child.
If hypovolemic: **NS 20 mL/kg IVP/IO in < 20 minutes. May repeat X 2 if necessary**.
Do not delay transport of time-sensitive pts to establish elective vascular access on scene

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

- **Respiratory rate > 60 breaths/min**  
  Cyanosis or a decreased \( \text{SpO}_2 \) despite administration of \( \text{O}_2 \)
- **Increased work of breathing (retractions, nasal flaring, grunting)**, respiratory fatigue and/or failure
- **Heart rates**: (Weak, thready, or absent peripheral pulses)
  - Child ≤ 8 years: < 80 BPM or > 180 BPM
  - Child > 8 years: < 60 BPM or > 160 BPM
- **Poor perfusion, dysrhythmias; chest pain**
- **Altered LOC (syncope, unusual irritability or lethargy or failure to respond to parents or painful procedures)**
- **Seizures**
- **Fever with petechiae**
- **Trauma**
- **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
- **Expose** and examine as indicated/

### **Environmental control**: keep warm with protected hot packs/blankets/warmers as able

#### PEDIATRIC 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>&gt; 5 years Oriented/ converses</td>
<td>5</td>
</tr>
<tr>
<td>To speech</td>
<td>2-5 years Oriented, appropriate words/phrases</td>
<td>5</td>
</tr>
<tr>
<td>To pain</td>
<td>Inappropriate words</td>
<td>3</td>
</tr>
<tr>
<td>None</td>
<td>Incomprehensible sounds</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>Incomp. sounds</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

- **No response**

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

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

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

6. **Pain:** Pharmacologic and non–pharmacologic (parental presence, distraction, topical use of cold packs) options should reflect a pt–centered approach based on specific needs. Consider pt status, responder scope of practice, risks/benefits of each strategy. Provide individualized pain mgt. regardless of transport interval.
   - If SBP ≥ minimum for age: **STANDARD DOSING:**
     - **NITROUS OXIDE if available**
     - **FENTANYL:** If > 2 yrs: 1 mcg/kg (round to closest 5 mcg -max single dose 100 mcg) IVP/IN/IM/IO.
       - May repeat once in 5 min: 0.5 mcg/kg (max 50 mcg). Max total dose per SOP: 150 mcg (1.5 mcg/kg)
     - **Additional doses require OLMC:** 0.5 mcg/kg q 5 min up to a total of 3 mcg/kg (300 mcg) if indicated & available
   - **Peds -sedation:** Children <6 yrs (esp. those < 6 mos) may be at greater risk for an adverse event from sedation and/or opiate pain medication. They are particularly vulnerable to the medication's effects on ventilatory drive, airway patency and protective airway reflexes.

**Safe sedation of children requires a systematic approach that includes the following:**
   - Close supervision by qualified EMS practitioner(s)
   - Pre-sedation evaluation for underlying medical conditions that would place child at risk from sedating medications
   - Airway exam for large (kissing) tonsils or anatomic airway abnormalities that might increase risk from sedating meds
   - Clear understanding of medication actions, side effects, and drug interactions
   - Appropriate training and skills in pediatric sedation and airway/ventilator management to allow rescue of the pt
   - Age and size appropriate equipment for airway management and vascular access
   - Appropriate medications and reversal agents (per local policy/procedures)
   - Sufficient staff to provide medication and monitor patient
   - Appropriate physiologic monitoring and continuous observation before, during, and after the procedure
   - Practitioners must have the skills and age and size-appropriate equipment based on their scope of practice to rescue a child from a level of sedation that is deeper than desired, apnea, laryngospasm, and/or airway obstruction. This includes the ability to open the airway, suction secretions, perform successful bag-mask ventilations, insert an oral airway, a nasopharyngeal airway, an extraglottic airway, and rarely perform tracheal intubation per local policy/procedures. (Am Acad of Pediatrics, 2016)
**Ongoing assessment**: Reassess VS and pt responses to interventions. Every transported pt should have at least 2 sets of VS.

**Stable**: At least q. 15 min & after each drug/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility

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


9. **Selection of receiving facility**: Transport children to the closest ED approved for Pediatrics (EDAP).

   *Stable pts may be transported to an alternate or more distant requested facility per local policy/procedure and/or with prior OLMC authorization.*

10. **Refusal of service**: All peds refusals must have OLMC contact per System policy even if parent /guardian consents to release.

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight kg</th>
<th>Normal Systolic BP Ages 1-10 90 + (2 x age in yrs)</th>
<th>SBP minimums 70 + (2 x age in yrs)</th>
<th>Heart rate</th>
<th>Resp rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonate (0-28 days)</td>
<td>3</td>
<td>&gt;60 mmHg</td>
<td>&gt;60 mmHg</td>
<td>100-180</td>
<td>30-60</td>
</tr>
<tr>
<td>Infant 1-12 mos</td>
<td>4-10</td>
<td>&gt; 90 mmHg</td>
<td>&gt;70</td>
<td>110-160</td>
<td>30-60</td>
</tr>
<tr>
<td>2 yr</td>
<td>12</td>
<td>&gt;94</td>
<td>&gt;70</td>
<td>90-150</td>
<td>24-40</td>
</tr>
<tr>
<td>4 yr</td>
<td>16</td>
<td>&gt;98</td>
<td>&gt;75</td>
<td>90-150</td>
<td>22-34</td>
</tr>
<tr>
<td>6 yr</td>
<td>20</td>
<td>&gt;102</td>
<td>&gt;80</td>
<td>70-120</td>
<td>18-30</td>
</tr>
<tr>
<td>8 yr</td>
<td>26</td>
<td>&gt;106</td>
<td>&gt;80</td>
<td>70-120</td>
<td>18-30</td>
</tr>
<tr>
<td>10 yr</td>
<td>32</td>
<td>&gt;110</td>
<td>&gt;90</td>
<td>70-120</td>
<td>18-30</td>
</tr>
<tr>
<td>12 yr</td>
<td>41</td>
<td>&gt;110</td>
<td>&gt;90</td>
<td>60-110</td>
<td>12-16</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 crackles or wheezes. If child has known paralysis carefully examine extremities for injury.
- Anticipate differences in anatomy, physical & cognitive development, possible surgical alterations or mechanical adjuncts.
- **Common home therapies:** respiratory support (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 airway support if in respiratory failure
7. **Vascular access** if IV meds or fluids needed. If chronic cardiac condition: IVF only per OLMC. NS 20 mL/kg IVF bolus if hypoperfused. If on anticoagulant like Coumadin (warfarin), use caution when starting IV or when handling child. They bruise easily and may have difficulty clotting.
8. Avoid placing defib pads over internal pacemaker generator (usually found in upper chest).
9. Consider use of inotropes (epinephrine) w/ severe hypotension unresolved with fluid boluses.
10. Rx seizures per SOP; monitor ECG as arrhythmias may be present in CSF shunt failure.
11. **Decompress stomach** by venting (opening) feeding tube if abdomen is distended.

**Chronic respiratory or cardiac problem**
- 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. Pad between stretcher straps and child. Drive cautiously. Avoid sudden jolts that could cause a fracture.

**Sickle cell disease:**
- Vasculo-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.
CHILDREN < 12 years of age shall have airways secured using BLS adjuncts & interventions

ADOLESCENTS > 12 yrs: Manage airways per adult SOPs

Possible indications for advanced airway support in children

- Persistent airway impairment, ventilatory failure (apnea, RR <10 or >40; shallow/labored effort; SpO₂ ≤ 92; increased WOB (retractions, nasal flaring, grunting) → fatigue
- Inability to ventilate/oxygenate adequately after insertion of OP/NP airway and/or via BVM
- Need for ↑ inspiratory or positive end expiratory pressures to maintain gas exchange or sedation to control ventilations.

1. Consider and Rx causes of obstruction; position, suction, manual maneuvers, medications if an allergic reaction, consider need for direct laryngoscopy and removal of FB; attempt to ventilate w/ peds BVM
2. AMS & airway patent: Gag reflex present: > 4 yrs: NPA; No gag reflex: OPA
   - Airway remains impaired: <12 years of age: Consider need for advanced airway: Contact OLMC
   - Assess SpO₂, evaluate before & after airway intervention; confirm patent IV; ECG monitor
3. Position: Age < 8; pad under torso; Age ≥ 8: Sniffing position with pad under occiput
4. Preoxygenate: O₂ 12-15 L/NRM or BVM every 3 to 5 sec. for 3 min. just to see the chest rise
5. Prepare equipment and place airway
   - Check suction source; attach rigid tip (Yankauer/tonsillar); prepare advanced airway
   - Select appropriate King Airway based on child's size, not chronological age;
   - Measure w/ Broselow tape up to 35 kg
   - Insert King Airway device and assess lung sounds and airway compliance
7. If successful:
   - O₂ 15 L/peds BVM ventilate every 3 to 5 seconds just to see chest rise
   - Note King Airway depth at teeth or gums Secure with commercial device. Reassess ETCO₂ & lung sounds.
   - Apply lateral head immobilization.
   - Continue to monitor ETCO₂ or capnography to confirm placement and effective airway management.
8. If unsuccessful: Ventilate with O₂ 15 L/peds BVM. May repeat attempt X 1.
9. If advanced airway unsuccessful and good air exchange w/ peds BVM: Continue ventilations/BVM.
   If patient deteriorates with an advanced airway in place: Consider DOPE:
   - Displacement of tube, Obstruction of tube, Pneumothorax, Equipment failure
# PEDIATRIC FOREIGN BODY AIRWAY OBSTRUCTION

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

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

## UNCONSCIOUS

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

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

### ALS interventions:
4. Perform direct laryngoscopy as soon as possible to inspect for F/B. Remove w/ forceps.
5. Still obstructed continue efforts to ventilate
PEDS RESPIRATORY ARREST

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

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

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

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

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

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

4. If possible narcotic/opioid OD:
   - NALOXONE 0.1 mg/kg (max single dose 0.4 mg) IVP/IN/IO/IM w/ repeat doses q/ 30 sec until ventilations increase up to 4 mg. [BLS IN and IM]

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

SUDDEN INFANT DEATH SYNDROME (SIDS)

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

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

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

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, SpO\textsubscript{2}, glucose monitoring; support ABCs per peds IMC. All should be transported to EDAP/PCCC.
PEDS ALLERGIC Reaction
ANAPHYLACTIC Shock

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

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

   Lower acuity: Mild SYSTEMIC Reaction
   SBP > 70 + (2 X age) or ≥ 90 if 10 - 12 yrs
   S&S: Peripheral tingling, warmth, fullness in mouth and throat, nasal congestion, periorbital swelling, rash, itching, tearing, and sneezing

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

   EMERGENT: Moderate SYSTEMIC Reaction
   SBP > 70 + (2 X age) or ≥ 90 if 10 - 12 yrs
   S&S: Above PLUS bronchospasm, dyspnea, wheezing, edema of airways, larynx, or soft tissues; cough, flushing, N&V, warmth, or anxiety

   2. EPINEPHRINE (1mg/1mL) 0.01 mg/kg (max single dose 0.3 mg) IM (vastus lateralis muscle) [BLS]
      - Typical dosing: 15 to 29 kg (33–65 lbs): 0.15 mg >30 kg (66 lbs): 0.3 mg
      - May repeat X 1 in 5-10 min prn; DO NOT DELAY TRANSPORT waiting for a response

   3. DIPHENHYDRAMINE 1 mg/kg (50 mg max) IVP [ALS]; if no IV give IM [BLS]

   4. If wheezing: ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg via HHN/mask. Add O₂ 6 L/NC if SpO₂ <94% [BLS]

   CRITICAL: Severe SYSTEMIC Reaction/ANAPHYLACTIC Shock
   Hypotensive for age
   Likely allergy; 2 or more of the following occurring rapidly after exposure:
   - Skin signs: Itching, flushing, hives, swelling/edema
   - Respiratory compromise: Severe dyspnea, hypoxia, decreased/absent lung sounds, wheeze, stridor, hoarseness
   - Cardiovascular collapse: HYPOTENSION; dysrhythmias; syncope, or coma
   Others: GI edema (dysphagia, intense abdominal cramping/pain, diarrhea, vomiting)

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

   As soon as vascular access is successful:

   3. EPINEPHRINE (1 mg/10mL) titrate in 0.01 mg/kg (0.1 mL/kg) doses q. 1 min up to max total 1 mg [IM + IVP/IO]
      Reassess after each 0.01 mg/kg.
      If no IV/IO: May repeat EPI (1mg/1mL) 0.15 mg - 0.3 mg IM as above in 5 min [BLS]
      If additional doses are needed; contact OLMC

   4. DIPHENHYDRAMINE 1 mg/kg (max 50 mg) IVP/IO; if no IV/IO give IM [BLS]

   6. If wheezing: ALBUTEROL 2.5 mg (3 mL) & IPRATROPIUM 0.5 mg /HHN/mask or peds BVM [BLS].
      May repeat X 1 enroute. [BLS]. If additional doses are needed due to long transport time: Contact OLMC

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

**CRITICAL (Severe distress):** Severe SOB, orthopnea, use of accessory muscles, speaks in syllables, tachypnea, lung sounds diminished or absent; exhausted; HR & BP may be dropping; SpO₂ ≤94%

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

Follow immediately with

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

3. **If severe distress persists:**
   - **MAGNESIUM (50%) 25 mg/kg** (max 2 Gm) mixed with NS to total volume of 20 mL (slow IVP) or (in 40 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.
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**. Allow adult to 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**: 1-3 day Hx inflammation & edema of larynx, trachea and bronchi usually caused by a virus; producing respiratory distress, dyspnea; ↑ RR; marked stridor, retractions, hoarse voice, barking cough, low grade fever

**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. **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.

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 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.
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   - If unable to ventilate: Temporarily stop ambulance; provide airway per Peds Airway Adjuncts SOP: Least invasive way possible.
**Search for and treat possible contributing factors:**

<table>
<thead>
<tr>
<th>Hypoxia or ventilation problem</th>
<th>Toxins</th>
<th>Excessive vagal stimulation</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Tamponade, cardiac</td>
<td>Thrombosis (coronary or pulmonary)</td>
</tr>
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<td>Hydrogen ion (acidosis)</td>
<td>Tension pneumothorax</td>
<td>Trauma (hypovolemia, ↑ ICP, brain stem compression)</td>
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<td>Trauma (hypovolemia, ↑ ICP, brain stem compression)</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 for age, respiratory difficulty/hypoxic, altered consciousness

2. IMC special considerations cont.
   - If unconscious and unresponsive to pain: Airway/ventilations using Peds IMC and Peds Airway Adjuncts SOP
   - Initiate CPR if HR < 60 in infant/child and poor systemic perfusion despite O₂ and ventilation: Compression to ventilation ratio 15:2 (30:2 if single provider)
   - IV/IO NS TKO: If S&S of hypovolemia: NS 20 mL/kg IVP/IO; may repeat X 2 if necessary
   - ECG monitoring; 12-lead ECG
   - Assess glucose: treat hypoglycemia per PEDs Glucose Emergencies SOP

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

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

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

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

If epinephrine, atropine ineffective or contraindicated or no vascular access

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

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

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

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

- Hypoxemia
- Hypothermia
- Tamponade, cardiac
- Hypovolemia/dehydration
- Hyper/hypokalemia
- Tension pneumothorax
- Hydrogen ion (acidosis)
- Pain
- Toxins/poisons/drugs
- 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: Rate usually < 220 BPM
- Children: Rate 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: Rate usually > 220 BPM
- Children: Rate usually > 180 BPM

Clinical presentations:

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

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

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

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

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

CRITICAL: SEVERE cardiorespiratory compromise:

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

2. IMC special considerations in conscious patient:
   - If IV/IO in place: May give brief trial of meds while preparing for cardioversion. See above.
   - IF SBP > 70 + (2X age): Sedate prior to cardioversion: MIDAZOLAM 0.1 mg/kg IVP/IO (0.2 mg/kg IN) (max single dose 5 mg). May repeat to total of 10 mg based on size and BP. If condition is deteriorating, omit sedation.
3. Synchronized cardioversion at 0.5 - 1 J/kg
   If delays in synchronization and condition critical, go immediately to unsynchronized shocks.
4. Cardioversion successful: Support ABCs; observe
5. Cardioversion unsuccessful: Synchronized cardioversion at 2 J/kg
   Re-evaluate rhythm & possible causes (metabolic or toxic). Treat possible causes.
PEDS WIDE COMPLEX TACHYCARDIA with Pulse
Rate > 120 - (QRS 0.12 sec or longer) – VT; SVT with aberrancy, WPW; torsades de pointes

Search for and treat possible contributing factors:
- Hypoxemia
- Hypovolemia
- Hypothermia
- Hyper/hypokalemia; hypoglycemia
- Tamponade, cardiac
- Tension pneumothorax
- Toxins/poisons/drugs
- 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 peds defib pads if available or prepare peds defib paddles.
   - Assess cardiac rhythm in more than one lead. Assess for S&S of HF.
   - HR varies from near normal to > 300. Confirm wide QRS (>0.08 s in infants; >0.09 s children > 3 years).

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

<table>
<thead>
<tr>
<th>Regular Monomorphic VT; polymorphic VT w/ normal QT interval; WPW; Irregular wide complex tachycardia; AF w/ aberrancy; AF w/ WPW (short PR, delta wave)</th>
<th>Irregular Polymorphic VT w/ Prolonged QT / Torsades de Pointes</th>
</tr>
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<tr>
<td>Contact OLMC first</td>
<td>3. MAGNESIUM (50%) 25 mg/kg (max 2 Gm) mixed with NS to total volume of 20 mL 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.</td>
</tr>
<tr>
<td>3. AMIODARONE 5 mg/kg (max 150 mg) mixed with NS to total volume of 20 mL IVP or (Alt. in 50 mL IVPB on mcgtt tubing) over 20 mins.</td>
<td></td>
</tr>
</tbody>
</table>

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

3. IMC special considerations
   - If IV placed: may give brief trial of meds while preparing for cardioversion. See above.
   - Sedation: If responsive & SBP > 70 + (2X age): MIDAZOLAM 0.1 mg/kg IVP (0.2 mg/kg IN) (max single dose 5 mg).
     May repeat X 1 up to 10 mg if needed & SBP > 70 + (2X age).
     If condition is deteriorating, omit sedation.
4. All but torsades (see above): SYNCHRONIZED CARDIOVERSION at 0.5 – 1 J/kg. Torsades de pointes: DEFIBRILLATE at 0.5 - 1 J/kg see below
   HR generally > 220 before cardioversion necessary in children.
   If not possible to synchronize and clinical condition critical, go immediately to unsynchronized defibrillation
   - Assess ECG and pulse after each shock delivery.
   - Treat post-cardioversion dysrhythmias per appropriate SOP.
5. If cardioversion successful:
   - Complete ALS IMC: Support ABCs; observe; keep warm; transport.
   - If VT returns after successful cardioversion, start protocol at last intervention.
6. If VT persists:
   - Complete ALS IMC; re-evaluate rhythm & possible causes (metabolic or toxic).
     AMIODARONE 5 mg/kg (max 150 mg) mixed with NS to total volume of 20 mL IVP or in 40 mL IVPB on mcgtt tubing over 20 mins.
     Synchronized cardioversion at 2 J/kg after ½ of the Amiodarone dose
   - Complete the medication even if patient converts after shock delivery provided BP is normal for age.
Use “Pit crew” or “Team” approach to cardiac arrest management per local policy/procedure.

Pts should not be moved while CPR is progress unless in a dangerous environment/adverse climate or pt is in need of intervention not immediately available (trauma). CPR is better and has fewer interruptions when resuscitation is conducted where the pt. is found. Continue resuscitation for at least 30 minutes (non-trauma) before moving.

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

- Determine unresponsiveness; open airway (manually); assess for breathing/gasping; suction prn; simultaneously Assess pulse: If not definitively felt in <10 sec - Begin quality CPR with compressions (See p. 89).
- Apply defib pads with chest compressions in progress as soon as monitor [ALS/AED [BLS] is available
- Check rhythm: Pause compressions just long enough to determine if rhythm is shockable (< 5 sec)
- Shockable? Resume compressions while charging monitor; charge to device specific joules see below

Pause compressions (< 5 sec) just long enough to deliver shock (after a compression -not a ventilation)

- BLS: AED Children < 8 yrs of age (up to 25 kg): use AED w/ pediatric attenuator if available
- Children 8 yrs and older: Use adult AED
- ALS: Cardiac monitor

- Defibrillate: 1 shock: Manual 2 J/kg (AED device specific); (adult energy in children > 50 kg)
  - Resume chest compressions immediately for 2 min (5 cycles).
  - NO rhythm/pulse check until after 2 min of CPR unless pt wakes or begins to move extremities.

- Airway/ventilations: Attach impedance threshold device and capnography (if available) between mask and bag

Witnessed arrest; shockable rhythm: Delayed PPV; do 3 cycles (200) compressions before ventilating; O₂/NRM

Unwitnessed arrest: BLS airways; ventilate with BVM; CPR at 30:2 ratio (5 cycles = 2 min); give 15 L O₂ when available

The following need to be accomplished simultaneously in separate time cycles

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

Check rhythm & ETCO₂ – as above

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

- Not shockable? Asystole/PEA; resume compressions

- Organized rhythm? ✓ palpable pulse → ROSC

Switch compressors during rhythm ✓

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

- Repeat pattern as long as CPR continues - PLUS

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

ALS interventions with no interruption to CPR

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

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

Return of spontaneous circulation (ROSC): Watch for abrupt rise in capnography; assess VS; ECG, SpO₂, ETCO₂ q. 5 min.

- Support ABCs; remove impedance threshold device; assist ventilations / start 2nd IV if needed
  - Do not hyperventilate even if ↑ ETCO₂; titrate O₂ to SpO₂: 94% (avoid hyperventilation and hyperoxia); follow appropriate SOP.
- BP support is high priority: If SBP < 70: provide fluids resuscitation at 20ml/kg (max 60ml/kg) per Peds IMC
  - Retake BP q. 2 min until desired BP reached, then every 5 min.
  - Keep fingers on pulse & watch SpO₂ pleth on monitor for 5 min to detect PEA; 
  - 12 Lead ECG ASAP after ROSC; assess glucose (Rx hypoglycemia)

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

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

- Avoid hyperthermia & hyperglycemia

Refer to specific SOPs: Hypothermia (p. 29); Peds Poisoning/OD (p. 84-85)
Use “Pit crew” or “Team” approach to cardiac arrest management per local policy/procedure.

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

Search for and treat possible contributing factors (Hs & Ts):
- Hypoxia (ventilate/O₂)
- Hypothermia (core rewarm)
- Toxins (opiate? Naloxone; TCA? NaHCO₃)
- Hypovolemia (IVF boluses)
- Hypo/hyperkalemia (NaHCO₃)
- H ion (acidosis; NaHCO₃)
- Hypoglycemia (glucose)
- Tension pneumothorax (lung snds; pleural decompression)
- Hypo/hyperkalemia (NaHCO₃)
- Tamponade, cardiac
- Thrombosis (coronary/pulmonary)
- Opiate? Naloxone

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

- Assess pulse: If not definitively felt in <10 sec - Begin quality CPR with compressions (See p. 90)
- Apply defib pads with chest compressions in progress as soon as monitor [ALS/AED BLS] is available

BLS: AED
- Children 1 to 8 yrs of age (up to 25 kg): use AED w/ pediatric attenuator if available
- Children 8 yrs and older: Use adult AED

ALS: Cardiac monitor

Check rhythm: Pause compressions just long enough to determine if rhythm is shockable (< 5 sec)
Not Shockable? [ALS] confirm asystole/PEA in 2 leads. Resume compressions immediately

- No rhythm/pulse check until after 2 min of CPR unless pt wakes or begins to move extremities (see below)
- Assess pulse: If not definitively felt in <10 sec - Begin quality CPR with compressions (See p. 90)

Airway/ventilations: Attach impedance threshold device and capnography (if available) between mask and bag

Witnessed arrest: Delayed PPV; do 3 cycles (200) compressions before ventilating; O₂/NRM

Unwitnessed arrest: BLS airways; ventilate with BVM; CPR at 30:2 ratio (5 cycles = 2 min); give 15 L O₂ when available

The following need to be accomplished simultaneously in separate time cycles

After each 2 min cycle of CPR (using real-time CPR feedback device if available):
Check rhythm & ETCO₂ – as above
- Not shockable? → Asystole/PEA/no shock advised; continue CPR
- Organized rhythm? ✓palpable pulse → ROSC

Switch compressors during rhythm ✓
- NO rhythm/pulse check until after 2 min of CPR unless pt wakes or move extremities
- Repeat pattern as long as CPR continues

ALS interventions with no interruption to CPR
- Establish vascular access (IV/IO): NS TKO. If dehydrated, hypovolemic: NS 20 mL/kg IVP. May repeat X 2 prn.
- When IV/IO available, give meds during CPR:
- EPINEPHRINE (1mg/10mL) 0.01 mg/kg (0.1 mL/kg) up to 1 mg IV/IO. Repeat q. 3-5 min as long as CPR continues.
- Airway per Peds Airway Adjunct SOP (Advanced airway NOT a priority if ventilations adequate w/ BVM)

As time allows: ✓Hs & Ts (treat appropriately)
If possible opioid OD: Naloxone standard dosing

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

BP support is high priority: If SBP < 70: provide fluids resuscitation at 20mL/kg (max 60mL/kg) per Peds IMC
Retake BP q. 2 min until desired BP reached, then every 5 min.

Keep fingers on pulse & watch SpO₂ pletch on monitor for 5 min to detect PEA; .

12 Lead ECG ASAP after ROSC; assess glucose (Rx hypoglycemia)

If patient remains unresponsive to verbal commands w/ no contraindications:
- Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.
- Avoid hyperthermia & hyperglycemia

Return of spontaneous circulation (ROSC): Watch for abrupt rise in capnography; assess VS; ECG, SpO₂, ETCO₂ q. 5 min.
- Support ABCs; assist ventilations / start 2nd IV if needed; Do not hyperventilate even if ↑ ETCO₂; titrate O₂ to SpO₂ 94%
- Avoid hyperventilation and hyperoxia; follow appropriate SOP.

If patient remains unresponsive to verbal commands w/ no contraindications:
- Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.
- Avoid hyperthermia & hyperglycemia

Refer to specific SOPs: Termination of Resuscitation (p. 8); Hypothermia (p. 29); Peds Poisoning/OD (p. 84-85)
# PEDS ALTERED MENTAL STATUS

**AMS:** Consider possible etiologies; use appropriate SOPs

- **A:** Alcohol and ingested drugs/toxins; ACS/HF, arrhythmias, anticoagulation
- **E:** Endocrine/exocrine, particularly thyroid/liver; electrolyte/fluid imbalances; ECG abnormalities: prolonged QT; Brugada syndrome (incomplete RBBB pattern in V1/V2 w/ ST segment elevation)
- **I:** Insulin disorders: hypoglycemia; DKA/HHNS
- **O:** O₂ deficit (hypoxia), opiates, overdose, occult blood loss (GI/GU)
- **T:** (recent) Trauma, temperature changes
- **I:** Infections, both neurologic and systemic
- **P:** Psychological; massive pulmonary embolism
- **S:** Space occupying lesions (epi or subdural, subarachnoid hemorrhage, tumors); stroke, shock, seizures

**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
- General appearance; odors on breath; evidence of alcohol/drug abuse; trauma
- VS: observe for abnormal respiratory patterns; ↑ or ↓ T; orthostatic changes
- Skin: Lesions that may be diagnostic of the etiology
- Neuro exam: Pupils/EOMs; visual deficits; motor/sensory exam; ✓ for nuchal rigidity; EMS stroke screen

1. **IMC** special considerations:
   - Suction cautiously prn; seizure/vomiting/aspiration precautions
   - GCS ≤ 8: Treat per Peds Airway SOP
   - 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 Lead ECG (long QT syndromes); Rx dysrhythmias per SOP
   - Monitor for S&S of ↑ ICP: reduce environmental stimuli
   - Document changes in the Peds GCS & VS

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

3. If possible **opiate/synthetic opiate toxicity** w/ AMS and slow respirations for age; may have small pupils:
   - **NALOXONE 0.1 mg/kg** (max single dose 0.4 mg) IVP/IN/IO/IM w/ repeat doses q/ 30 sec until ventilations increase up to 4 mg. [BLS: EMTs: IN and IM]
Note: Peds patients have high glucose requirements and low glycogen stores. During periods of ↑ energy requirements, such as shock, they may become hypoglycemic.

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

### Blood sugar < 70 or S & S of hypoglycemia

2. **BLS**: If GCS is 14-15 and patient is able to swallow: oral glucose in the form of paste, gel, or liquid if available
3. **ALS**: If borderline glucose level (60-70) & symptomatic: give ½ Dextrose dose (see below)
4. **Children and Infants (up to 50 kg or 110 lbs) if bG < 60:**
   - **DEXTROSE 10%** (25 g/250 mL) 0.5g/kg up to 25 g (5mL/kg). See dosing chart on page 102..
     - For smaller children, draw up desired volume into a syringe and administer slow IVP.
     - Observe pt for improvement while dose is given.
   - If S&S of hypoglycemia fully reverse and pt becomes decisional after a partial dose, reassess bG.
     - If >70; slow D10% to TKO to deliver remainder of calculated dose. Once given, close clamp to D10% IV and open 0.9 NS TKO.
   - **If bG is borderline 60-70 and symptomatic:** Give ½ of the dose as listed above.
5. If no IV/IO: **GLUCAGON** < 20 kg: 0.03 mg/kg (0.5 mg) IM/IN; ≥ 20 kg: 1 mg IN/IN [BLS] Vastus lateralis muscle
6. Observe and record response to treatment; recheck glucose level
   - **If 70 or greater:** Ongoing assessment
   - If no improvement after first D10% dose and bG remains <70: give additional D10% 0.5 g/kg (5 mL/kg) up to 25 g IV/VP 5 minutes after initial dose followed by reassessment.
7. If parent or guardian refuses transport, they must be advised to feed the child before EMS leaves the scene.

### Ketoacidosis (DKA)

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

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

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

### Anxiety/serotonin syndrome: MIDAZOLAM
- 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (Max single dose 5 mg) q. 2 min up to 10 mg based on size, BP

### Tonic clonic seizures: MIDAZOLAM
- 0.1 mg/kg IVP/IO q. 30-60 sec (0.2 mg/kg IN/IM) (Max single dose 5 mg) up to 10 mg IVP/IN/IO/IM

**NALOXONE 0.1 mg/kg** (2mg/2mL)(max single dose 0.4 mg) IVP/IN/IO/IM w/ repeat doses q/ 30 sec until ventilations increase up to 4 mg. [BLS: EMTs: IN and IM]

### GENERAL APPROACH

1. **History:** Determine method of injury: ingestion, injected, absorbed, or inhaled; pts often unreliable historians.
2. **IMC** special considerations:
   - Uncooperative behavior may be due to intoxication/poisoning; do not get distracted from assessment of underlying pathology
   - Anticipate hypoxia, respiratory arrest, seizure activity, dysrhythmias, and/or vomiting
   - Airway access / control per Peds Airway Adjuncts SOP
   - Support ventilations w/ 15L 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
4. If possible opiate toxicity w/AMS + respiratory depression/arrest: **NALOXONE** as above
5. **Anxiety/serotonin syndrome: MIDAZOLAM** as above titrated to response
   - **Tonic clonic seizures:** MIDAZOLAM as above titrated to stop seizure.

### BETA BLOCKER

- **“LOLs” - See list on Pulmonary Edema/Cardiogenic shock SOP.**

### CYCLIC ANTIDEPRESSANTS: Adapin, Amtriptyline, Amoxapine, Anafranil, Ascendin, Desipramine, Desyrel, Doxepin, Elavil, Endep, Imipramine, Limbitro, Ludmil, Norpramine, Pamelor, Sinequan, Travidil, Tofranil, Vivactil

- These do **NOT** include serotonin reuptake inhibitors (SSRIs) like Paxil, Prozac, Luvox, Zoloft

### 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 meph, Easy lay, G-riffic, Grievous body harm, liquid ecstasy, liquid x, organic quaalude, salty water, scoop, soap, and somatomax; SSRIs

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### 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.

### INHALANTS: Caustic agents in form of gasses, vapors, fumes or aerosols. Ex: Gases - CO, NH4 (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, NV, 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.

### INHALANTS
- Caustic agents in form of gasses, vapors, fumes or aerosols. Ex: Gases - CO, NH4 (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, NV, syncope, mood changes, short-term memory loss, diminished hearing, muscle spasms, brain damage, non-cardiogenic pulmonary edema, and dysrhythmias. Sniffing volatile solvents can affect the nervous system, liver, kidneys, blood, bone marrow and severely damage brain. Can suffer from "sudden sniffing death" from a single session of inhalant use.

6. Look for discoloration, spots or sores around the mouth, nausea, anorexia, chemical breath odor and drunken appearance. Supportive care.
5. Per OLMC:
   4. If hypotensive or pulseless: (Ultram), Tylox, Wygesic
   3. Establish OLMC ASAP so receiving hospital is prepared for your arrival
   7. Assess need for restraints; monitor for HTN after opiate is reversed if speedballs are used

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

6. Haz mat precautions; remove from contaminated area; decontaminate as much as possible before moving to ambulance.

7. ATROPINE 0.02 mg/kg (minimum 0.1 mg) rapid IVP/IM: Repeat q. 3 min until improvement (reduction in secretions).

  Usual atropine dose limit does not apply – See WMD Chemical Exposures. Cholinergic poisonings cause an accumulation of acetylcholine. Atropine blocks acetylcholine receptors, thus inhibiting parasympathetic stimulation. Also see Chemical Agents SOP.

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

6. Supportive care for sympathomimetic effects and AMS; prepare to secure pt safety with restraint if necessary

7. If agitated, seizures, serotonin syndrome &/or HTN crisis. MIDAZOLAM standard dose (top previous page)

8. If hallucinations: quiet environment devoid of stimulation (lights, noise and touch)

CARBON MONOXIDE POISONING

1. IMC special considerations:
   ▪ Use appropriate Haz-mat precautions & PPE; remove patient from CO environment as soon as possible
   ▪ O₂ 12-15 L/NRM or BVM; ensure tight seal of mask to face; SpO₂ UNRELIABLE to indicate degree of hypoxemia
   ▪ Vomiting precautions; ready suction; monitor ECG
   ▪ Keep patient as quiet as possible to minimize tissue oxygen demands
   ▪ CO screening per System policy if available. If using CO-oximeter >12% abnormal, (<3% CO normal, smokers may have as high as 10%); use manufacturer standard levels if given; carefully assess for clinical correlation due to questionable device sensitivity.

2. Transport lower acuity/stable patients to nearest hospital

   Severely confused/hemodynamically stable: Consider transporting directly to a facility w/ a hyperbaric chamber (OLMC order). CRITICAL: If in respiratory/cardiac arrest or airway unsecured, transport to nearest hospital.

Hyperbaric oxygen chambers

<table>
<thead>
<tr>
<th>Advocate Lutheran General Hospital</th>
<th>847/ 723-5155</th>
<th>24/7</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Luke’s Medical Center (Milwaukee)</td>
<td>414/ 649-6577</td>
<td>24/7</td>
</tr>
</tbody>
</table>

Time sensitive patient

CYANIDE EXPOSURE (CRITICAL)

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

Assess for hypotension, CNS depression, metabolic acidosis, soot in nares or respiratory secretions, rapid CV collapse, central apnea, and seizures.

1. PPE including SCBA; evacuate danger area

2. IMC per Peds Drug OD/Poisoning SOP; decontaminate as necessary. Do NOT direct water jet on liquid.

   Absorb liquid in sand or inert absorbent and remove to a safe place. Remove vapor cloud w/ fine water spray. Remove contaminated clothing and wash skin with soap and water for 2-3 min.

3. Establish OLMC ASAP so receiving hospital is prepared for your arrival

4. If hypotensive or pulseless: NS 20 mL/kg IV/P/IO. May repeat X 2 as needed; CPR as indicated.

5. Per OLMC: Cyanide-antidote if available: AMYL NITRITE inhalants 1 per min X 12 min OR HYDROXOCOBALAMIN 70 mg/kg (max 5 gm)(one vial) given IV/PB over 15 min. May repeat X 1 if available and response inadequate to 1st dose. Max total dose 10 g.

POISON CONTROL CENTER #: 1-800-222-1222

www.illinoispoisoncenter.org
# Peds Seizures

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

## Consider Possible Etiologies
- Anoxia/hypoxia
- Cerebral palsy or other disabilities
- Metabolic (glucose, electrolytes, acidosis)
- Trauma/child abuse

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

## 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

## Generalized Seizures

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonic clonic</td>
<td>Aura, muscle rigidity, rhythmic jerking, postictal state. Lasts seconds to 5 min or more.</td>
</tr>
<tr>
<td>Absence</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 times a day.</td>
</tr>
</tbody>
</table>

## Partial Seizures

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<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-clonic seizure.</td>
</tr>
</tbody>
</table>

## Febrile Seizures

- Febrile seizures are the most common seizure disorder in childhood, affecting 2% to 5% of children between 6 to 60 months. Simple febrile seizures are defined as brief (< 15-min) generalized seizures that occur once during a 24-hr period in a febrile child who does not have an intracranial infection, metabolic disturbance, or history of alebrile seizures.
- Assess hydration status. If dehydrated, may attempt IV X 1. If successful: NS 20 mL/kg IVP.
- Reassure/calm child and parents/guardians.
- Passively cool by removing all clothing but diaper/underwear. Cover lightly. Do not induce shivering. Temp may rebound and may cause another seizure.
- NPO (Do not give over-the-counter anti-fever medications unless ordered by OLMC.)
- ASA is contraindicated in unknown viral situations.

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

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- Passively cool by removing all clothing but diaper/underwear. Cover lightly. Do not induce shivering. Temp may rebound and may cause another seizure.
- NPO (Do not give over-the-counter anti-fever medications unless ordered by OLMC.)
- ASA is contraindicated in unknown viral situations.
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 ped GCS; chief complaint S&S
4. **Sequencing priorities if exsanguinating hemorrhage:** C-A-B-C-D-E: Hemorrhage control first.
   - **AIRWAY/SPINE:** snoring, gurgling, stridor, silence. Consider possible spine injury
     - Open/maintain using position, suction, adjuncts & manual spine precautions prn (Peds Airway Adjunct SOP); vomiting/seizure precautions
     - Once airway controlled: Apply appropriate size c-collar + selective spine precautions if indicated. If backboard used: Position infants/children < 2 yrs supine w/ a recess for head or pad under back from shoulders to buttocks
     - **Oxygen 1-6 L/NC:** Adequate rate/depth; minimal distress and SpO2 ≥ 95
     - **Oxygen 12-15 L/NRM:** Adequate rate/depth: mod/severe distress; S&S hypoxia or as specified in protocol
     - **Oxygen 15 L / BVM:** Inadequate rate/depth: mod/severe distress; unstable
     - Ventilate at 1 breath every 3 to 5 seconds. Avoid hyperventilation.

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%
     - Oxygen 1-6 L/NC
     - Oxygen 12-15 L/NRM
     - Oxygen 15 L / BVM

6. **CIRCULATION/perfusion:** Compare carotid/brachial pulses for presence, general rate, quality, regularity, & equality; assess skin color, temperature, moisture, capillary refill
   - No carotid pulse & unresponsive OR pulse present but < 60 in infant or child with poor perfusion: **Begin CPR**
   - See Adult Traumatic Arrest; Quality CPR see appendix – go to appropriate SOP for rhythm/condition.
   - **Assess type, amount, source(s) and rate of bleeding:** hemorrhage control:
     - Direct pressure; pressure dressings to injury. If direct pressure ineffective or impractical:
     - Pack wound w/ topical hemostatic gauze/ apply direct pressure. Freq. ✓ for bleeding.
     - **Limb w/uncontrolled bleeding:** Tourniquet 2-3 cm proximal to wound; not over a joint; tighten until bleeding stops/distal pulse occluded. If bleeding continues, place 2nd proximal to 1st. Should be visible/well marked (time applied), do not remove. Anticipate pain.
     - **Pelvic fx:** Wrap w/ sheet, pelvic binder, or secure pelvis in upside down KED
     - If suspected cardiac tamponade, blunt aortic or cardiac injury → **Chest Trauma SOP**
   - **Vascular access:** Indicated for actual/potential volume replacement and/or IV meds prior to hospital arrival
     - Base catheter size & infusion rate on pt size, hemodynamic status
     - IV 0.9% NS (war if possible): **NS 20 mL/kg IVP** if S&S of hypoperfusion present.
       - Repeat rapidly X 2 if HR, LOC, capillary refill & other S&S of perfusion fail to improve. ); do not exceed BP targets. Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome
       - Do not delay transport in time-sensitive patients to establish vascular access on scene
       - **Indications for IO:** Pts in extremis needing urgent IVF and/or medications, esp. if circulatory collapse; difficult, delayed or impossible venous access; burns or injuries preventing venous access at other sites
       - Limit 2 attempts/route unless situation demands or authorized by OLMC to continue
     - **Peripheral IV may be attempted enroute; IO should be placed while stationary**
     - **Monitor ECG if actual or potential cardiorespiratory compromise** – integrate appropriate SOP
   - **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.
     - **Pain mgt** If > 2 yrs & SBP ≥ minimum for age: **FENTANYL** - standard dose per peds IMC
     - **Nausea:** **ONDANSETRON** – standard dose per IMC
   - **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 pp 49-50

1. Obtain baseline VS: BP (MAP if able) – Obtain 1st BP manually; trend pulse pressures; Pulse: rate, quality, rhythmicity Respirations: rate, pattern, depth Temp if indicated

**SAMPLE history**: OPQRST of chief complaint/pain using appropriate pain scale consistent with the pt's age, condition, and ability to understand; **Allergies** (meds, environment, foods), **Medications** (prescription/over-the-counter – bring containers to hospital if possible), PMH (medic-alert jewelry; medical devices/implants); Last oral intake/LMP; Events leading to injury

2. **Review of Systems**: 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; 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; temporarily remove anterior c-collar to assess neck prn
   - **CHEST**: Auscultate lung/heart sounds
   - **ABDOMEN**: Signs of injury/peritonitis by quadrant: contour, visible pulsations, wounds/bruising patterns, pain referral sites, localized tenderness, guarding, and rigidity
   - **PELVIS/GU**: Inspect perineum for blood at urinary meatus, rectum
   - **EXTREMITIES**: Inspect for position, false motion, skin color, and signs of injury
   - **BACK/flank**: Note any muscle spasms
   - **Neuro**: Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; ataxia
   - **SKIN/SOFT TISSUE**: Color (variation), moisture; temp, lesions/wounds; sub-q emphysema

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

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

5. Document Pediatric Trauma Score parameters on ePCR/EHR

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

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

### PEDIATRIC TRAUMA SCORE: Age 12 and under

<table>
<thead>
<tr>
<th>Component</th>
<th>+2</th>
<th>+1</th>
<th>-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>&gt; 20 kg (40 lbs) (5 yrs)</td>
<td>11 - 20 kg (1-5 yrs)</td>
<td>≤ 10 kg (22 lbs) (≤ 1 year)</td>
</tr>
<tr>
<td>Airway</td>
<td>Normal</td>
<td>Maintainable using position/chin lift</td>
<td>Unmaintainable or intubated</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>
</tr>
<tr>
<td>CNS</td>
<td>Awake</td>
<td>Lost consciousness / Obtunded</td>
<td>Coma; unresponsive</td>
</tr>
<tr>
<td>Skeletal injury</td>
<td>None</td>
<td>Closed fracture</td>
<td>Open/multiple fractures</td>
</tr>
<tr>
<td>Open wounds</td>
<td>None</td>
<td>Minor</td>
<td>Major or penetrating</td>
</tr>
</tbody>
</table>

Scores range from -6 to +12

A PTS of < 8 usually indicates the need for evaluation at a Trauma Center.

### TRAUMATIC ARREST

**Peds ITC**: pleural decompression per adult traumatic arrest SOP; Rx rhythm per peds SOP

**HEAD Trauma**

Peds ITC; Rx. seizures per Peds Seizure SOP

**SPINE Trauma**

Peds ITC; Assess & Rx per adult SCI SOP pp. 49-50

**Assess need for chemical restraint**: If patient is combative & will not remain motionless despite verbal warning and BP WNL for age, consider need for MIDAZOLAM 0.1 mg/kg slow IVP/IM (0.2 mg/kg IN/IM) (max single dose 5 mg). May repeat to a total of 10 mg based on size and BP.

**CHEST Trauma**

Peds ITC; follow adult SOP for specific injury interventions

**EYE/FACIAL Trauma**

Peds ITC; follow adult SOP for specific injury interventions

**MUSCULOSKELETAL**

Peds ITC; follow adult SOP for specific interventions; size-approp. doses of fentanyl, midazolam, sodium bicarbonate
SUSPECTED CHILD ABUSE OR NEGLECT

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

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

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

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

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

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

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

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

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

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

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

<table>
<thead>
<tr>
<th>Age group</th>
<th>Adults</th>
<th>Children</th>
<th>Infants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recognition of cardiac arrest</strong></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><strong>Compression/ventilation ratio before adv airway</strong></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><strong>CPR sequence</strong></td>
<td>CAB – unless hypoxia-related arrest (drowning)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression rate</strong></td>
<td>100-120/min (100-110 when using RQP) avoid rate &gt;120 (use audible prompt for correct rate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression depth</strong></td>
<td>2” – 2.4” (5-6 cm)</td>
<td>At least ⅓ AP chest depth (~2 in)</td>
<td>At least ⅓ AP chest depth (~1½ in)</td>
</tr>
<tr>
<td><strong>Hand location</strong></td>
<td>2 hands; lower ½ of sternum</td>
<td>2 hands or 1 hand (very small child) on lower ½ 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><strong>Chest wall recoil</strong></td>
<td>Allow full recoil after compression; lift hand slightly off chest</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rotation of compressors</strong></td>
<td>Every 2 min during ECG rhythm checks (should take &lt; 5 sec)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression interruptions</strong></td>
<td>Maximize compression time; limit interruptions to &lt; 5 seconds Ideally, pause only for ventilations (until advanced airway), rhythm check &amp; shock delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Use of mechanical chest compression device</strong></td>
<td>ILCOR &amp; ERC recommend against routine use; if &lt; 5 rescuers on scene or transport needed, may apply after 2nd two-minute round of CPR; after vascular access &amp; 1st drugs given per local policy/procedure</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Verification of quality 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 mmHg, improve CPR quality; Predicts ROSC; 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 epinephrine due to ↓ pulmonary blood flow</td>
<td></td>
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</tr>
<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; vascular access; &amp; 1st drugs. Insert sooner if BVM ventilations unsuccessful.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ventilations</strong></td>
<td>Witnessed arrest; shockable rhythm: Delayed PPV; 3 cycles (200) compressions O₂/NRM BVM 2 hands tight face-mask seal during compressions; compressor squeezes bag RQP/ITD attached to mask/adv airway if available After Adv airway: Do not pause chest compressions for ventilations Avoid hyperventilation (watch rate &amp; volume): Adult: 10/8BPM unless asthmatic (6-8/min) Just enough volume for visible chest rise; give O₂ 15L/min when available</td>
<td></td>
<td></td>
</tr>
<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: ↑ defibr energy to 200 J; ZOLL biphasic: max = 200 J; Physio LP12/15: max = 360 J</td>
<td></td>
<td></td>
</tr>
</tbody>
</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 Pain</td>
</tr>
<tr>
<td><strong>P E R F U S I O N</strong></td>
<td></td>
<td></td>
</tr>
<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>
<td></td>
</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 (allergy in all drugs)/Precautions</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACETAMINOPHEN</strong>&lt;br&gt;(Tylenol, Actamin, Apra, Mapap, Q-Pap, Tactinal, Tempra, Tycolene, Vitapap)&lt;br&gt;Tablet: 325 mg</td>
<td>Adults &amp; adolescents ≥50 kg: 650 mg PO; max single dose 1000 mg&lt;br&gt;Adults and adolescents &lt;50 kg: 12.5 mg/kg, max single dose: 15 mg/kg</td>
<td>Antipyretic Analgesic</td>
<td>Minor to mod pain: headache, muscle aches, arthritis, backache, toothaches, colds, and fever</td>
<td>Severe liver disease</td>
<td>Severe skin reaction that can be fatal: redness or rash that spreads and causes blistering and peeling.</td>
</tr>
<tr>
<td><strong>ADENOSINE</strong>&lt;br&gt;(Adenocard)</td>
<td>Adults: 6 mg rapid IVP followed by 20 mL NS&lt;br&gt;Repeat: 12 mg rapid IVP followed by 20 mL NS&lt;br&gt;Peds: 0.1 mg/kg rapid IVP (max 1st dose 6 mg) followed by 5-10 mL NS rapid IVP. May repeat X1: 0.2 mg/kg followed by 5-10 mL NS rapid IVP. Max single dose: 12 mg</td>
<td>Class: Endogenous nucleoside; antiarrhythmic&lt;br&gt;- Temporarily slows/blocks conduction thru AV node&lt;br&gt;- Interrupts AV reentry pathways&lt;br&gt;- Neg chronotropic/ dromotropic</td>
<td>Very short half life&lt;br&gt;Onset &amp; peak: 10-30 sec&lt;br&gt;Duration: 30 sec&lt;br&gt;Conversion rates&lt;br&gt;- 6 mg = 60%&lt;br&gt;- 12 mg =92%</td>
<td>- Asthma -may cause bronchospasm&lt;br&gt;- Bradycardia&lt;br&gt;- 2° or 3° AVB (except those w/ a functioning pacemaker)&lt;br&gt;- SA node disease&lt;br&gt;- Will not terminate known AF/A-flutter, but will slow AV conduction to identify waves&lt;br&gt;Perform 12L ECG prior to administration&lt;br&gt;Proximal IV; use med port closest to pt</td>
<td>Warn pt about flushing (face), SOB, &amp; chest pressure or pain BEFORE administration. Explain that S&amp;S will last &lt; 10 sec.</td>
</tr>
<tr>
<td><strong>ALBUTEROL</strong>&lt;br&gt;(Proventil, Ventolin, ProAir, AccuNeb)&lt;br&gt;2.5 mg / 3 mL</td>
<td>Bronchospasm: 2.5 mg / HHN, mask or in-line w/ 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 albuterol X 1.&lt;br&gt;Hyperkalemia: 5-mg continuous neb up to 20 mg over 15 min. DO NOT wait at scene for response. Begin Rx &amp; transport ASAP.</td>
<td>- Selective beta-2 agonist - smooth muscle relaxant causes bronchodilation&lt;br&gt;- Helps return potassium into cells by activating the sodium potassium pump at the cell membrane</td>
<td>- Bronchospasm associated w/asthma, COPD, allergic reactions; croup, or cystic fibrosis&lt;br&gt;- Hyperkalemia</td>
<td>Precautions&lt;br&gt;Cardiac stimulant. Use w/ caution in pts w/ ACS, dysrhythmias, symptomatic tachycardia, diabetes, HTN, seizures; or active labor. Hypoxia may ↑ incidence of CV SE</td>
<td>CNS: Tremors, nervousness, anxiety, dizziness, HA&lt;br&gt;CV: ↑ HR; ↑ or ↓ BP, palpitations, dysrhythmias, chest pain, angina&lt;br&gt;GI: nausea/vomiting&lt;br&gt;Resp: Paradoxical bronchospasm, hypoxia dt ventilation/perfusion mismatch&lt;br&gt;Metabolic: hypokalemia</td>
</tr>
<tr>
<td>Name</td>
<td>Dose/Route</td>
<td>Action</td>
<td>Indications for EMS</td>
<td>Contraindications (allergy in all drugs)/ Precautions</td>
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<td>-----------------------</td>
<td>----------------------------------------------------------------------------</td>
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| AMIODARONE            | Adult: VT w/ pulse: 150 mg in 7 mL NS slow IVP over 10 min (Alt. 150mg in 100 mL NS IVPB over 10 min) | Antidysrhythmic – predominately Class III; properties of all 4 Vaughn-Williams classes (delays repolarization prolonging action potential; slows AV conduction; prolongs AV refractory period & QT interval), slows vent. conduction (widens QRS), blocks Na, K, Ca channels, & α / β receptors - Neg. chronotropic & dromotropic effects - Vasodilates = ↓ cardiac workload and myocardial O₂ consumption | - VT (regular, wide complex tachycardia w/ normal QT stable pt w/ pulse  
- VF/PVT  
- OLMC may order for (SVT, A-fib/flutter)  
Less proarhythmic effects than other class I or III antidysrhythmics | Contraindications:  
- Bradycardia; 2°-3° AVB  
- Torresdes de Pointes  
- Stop infusion if QRS widens to >50% of baseline  
Avoid during breastfeeding | Monitor BP & ECG when given to pt w/ perfusing rhythm  
- VT: If ↓ BP occurs: slow rate or stop drug  
- VF: Post-ROSC. ↓ BP - Rx. w/ fluids/ norepinephrine  
- Bradycardias  
- Nausea |
| ASPIRIN (Acetylsalicylic acid, "ASA") | 81 mg tabs BLS | Class: Salicylate  
- Antiplatelet: Prevents clot from getting bigger by preventing platelet aggregation; blocks formation of thromboxane A₂  
- Blocks prostaglandin release (anti-inflammatory)  
- Non-steroidal anti-inflammatory drug (NSAID) | Suspected ACS, angina equivalents, & AMI regardless of pain unless contraindicated or an adequate dose of immediate-release ASA can be verified as taken. | Children ≤ 18; AMS  
Chest pain/STEMI following recent trauma (esp. head) prior to CT  
Possible stroke or ICH: Currently vomiting; surgery within 2 wks, bleeding disorders; ≥ 6 mos pregnant; active peptic ulcer/severe liver disease | - GI: Nausea/vomiting; irritation/bleeding  
- Prolonged bleeding time  
- Asthma pts may have ASA sensitivity; cause bronchospasm |
| ATROPINE DuoDote Auto-injector dosing – see Chemical agents SOP-BLS | Symptomatic bradycardia: 0.5 mg rapid IVP/IO q. 3-5 min to max.3 mg  
Cholinergic poisoning: See chart Chemical Agents. No dose limit.  
Peds: 0.02 mg/kg IV/IO Min. 0.1 mg; Max doses  
Child single dose: 0.5 mg  
Child total dose: 1 mg  
Adolescent single dose 1 mg  
Adolescent total dose 2 mg | Class: Anticholinergic (parasympathetic blocker)  
- Indirectly ↑ HR and AV conduction  
- ↓ GI motility  
- Dries secretions  
- Dilates bronchioles  
Slow administration (resulting in low dose) or dose <0.5 mg in an adult may worsen bradycardia | - Symptomatic bradycardia (most likely to work if QRS is narrow)  
- Cholinergic poisonings (organophosphates/ WMD gasses)  
- Neurogenic shock  
- - | Contraindications:  
- Asymptomatic bradycardia  
- AVB below His-Purkinje level: 2° AVB M II  
3°AVB w/ wide QRS  
- Unlikely to be effective in pts w/ heart transplant | 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) |
| BENZOCAINE 20%  
(Hurricane, Americaine, Cetacaine) | 1-2 sec spray, 30 seconds apart X 2; use straw to spray deep post. pharynx  
Onset: Immediate Duration: 5-10 min | Class: Local anesthetic, ester type (tetraaine, cocaine, procaine)  
- Topical anesthetic for mucus membranes  
- Helps suppress gag reflex | To suppress gag reflex prior to DAI | Hypersensitivity to “caines”  
Use minimum dose in pts at risk of complications due to methemoglobinemia (asthma, COPD, heart disease, smokers) & at ↑ risk of methemoglobinemia (< 4 mos) | - Suppressed gag reflex  
- Unpleasant taste  
- Methemoglobinemia: Pale, blue/grey skin, HA, lightheadedness, dyspnea, anxiety, fatigue, ↑ HR |
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<td>Calcium gluconate 2.5% gel</td>
<td>Flush area w/ water. Apply gel directly from tube and massage into burned area. Apply frequently (q. 15 min) until pain relieved. Hand burns: apply liberal amount of gel to area, have pt put on a vinyl glove and wiggle fingers, opening and closing hand. Change gel &amp; glove every 5 min by removing glove, wiping off gel, then reapplying as before.</td>
<td>Clear, viscous, colorless, odorless, water soluble gel Reacts with hydrofluoric acid to form insoluble, non-toxic calcium fluoride. May immerse gloved hand into ice water for up to 3-5 min. Remove hand from water, rewarm, then reintroduce into water for another 3-5 min.</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>Contraindications: - Hypercalcemia - Sarcoidosis - Severe hypokalemia Precautions: - Allergy - Glaucoma - Shock (SBP &lt;90) - Pregnancy unless seizing</td>
<td>Ensure adequate ventilation at all times None; painless to apply Helps prevent risk of hypocalcemia from burn</td>
</tr>
<tr>
<td>DIAZEPAM (Valium/Diastat)</td>
<td>Adults: 2mg increments to 10mg slow IVPI/IO or 4-20mg IR; Peds: 0.3mg/kg IVP/IO (max 10mg) or 0.5mg/kg IR (max 20 mg)</td>
<td>Class: Benzodiazepine - Sedative/hypnotic - CNS depressant - Anxiolysis (↓ anxiety) - Amnestic (anterograde) - Skeletal muscle relaxant Potentiates GABA (major inhibitory neurotransmitter of CNS). May potentiate action of other CNS depressants (Fentanyl, alcohol) – monitor closely</td>
<td>Procedural sedation prior to DAI and/or cardioversion - Generalized tonic/clonic seizure activity - Severe anxiety/agitation - Muscle relaxant for long bone fractures - Stimulant-induced excited delirium, ACS, tachycardia, HTN crisis; (cocaine, amphetamines, ephedrine, PCP)</td>
<td>- Allergy - Glaucoma - Shock (SBP &lt;90) - Pregnancy unless seizing</td>
<td>CNS: Drowsiness, sedation, confusion, amnesia, ataxia Resp: Respiratory depression, arrest CV: Hypotension, bradycardia/tachycardia</td>
</tr>
<tr>
<td>DEXTROSE 10% (25 g/250 mL) IVPB</td>
<td>See glucose emergencies SOP for dosing instructions. Adult: bG 60-70: 12.5 grams (125 mL or ½ IV bag) Adult: bG &lt; 60 (no pulm. edema: 25 gms (250 mL) run WO PEDS: 0.5 g/kg (5 mL/kg) (0.1 g/1 mL in solution). See dose chart p. 101 Max initial dose: 25 g</td>
<td>Class: carbohydrate Same amt of dextrose as in D50% solution (25 Gm); more dilute</td>
<td>Hypoglycemia: bG &lt;70 and/or S&amp;S hypoglycemia and bG reading unavailable If HF or Hx of HF &amp; lungs clear: dose as usual, slow infusion rate to 50 mL incr followed by reassessment If HF &amp; crackles or wheezes: Call OLMC for orders</td>
<td>bG normal or high Do not give sub-q or IM ○ patency before infusing Giving too forcefully can result in loss of IV line and damage to surrounding tissues. If IV infiltrates / IVF extravasates, stop infusion &amp; inform OLMC If transport refused after dextrose, assure pt eat</td>
<td>Hyperglycemia. SE not as likely with D10% as D50%: hyperosmolarity, hypervolemia, phlebitis, pulmonary edema, cerebral hemorrhage, &amp; cerebral ischemia</td>
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<td><strong>DIPHENHYDRAMINE</strong></td>
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<td>(Benadryl)</td>
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<tr>
<td><strong>DOPAMINE</strong></td>
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<tr>
<td>(Intropin)</td>
<td>400 mg in 250 mL or 800 mg/500 mL D₃W or NS</td>
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<td><strong>EPINEPHRINE</strong></td>
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<td>(Adrenalin)</td>
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### DIPHENHYDRAMINE (Benadryl)

- **Lower acuity:** 1 mg/kg (max 50 mg) PO/IM [BLS]
- **Emergent:** 50 mg IVP [ALS]; if no IV give IM [BLS]
- **Critical Rx:** 50 mg IVP/IO; if no IV/IO give IM [BLS]
- **Peds:** 1 mg/kg (max 50 mg) PO [BLS]; slow IVP/IO [ALS] over 2 mins; if no IV/IO give IM [BLS]

**Action:**
- 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.

**Indications for EMS:**
- Allergic reactions/ anaphylaxis
- **Per OLMC:** Dystonic reactions due to phenothiazines (Thorazine, Compazine, Stelazine, Prolixin)

**Contraindications (allergy in all drugs)/Precautions:**
- Acute asthma attack
- Hx asthma w/ current allergic reaction – OK to use

**Side Effects:**
- **CNS:** Drowsiness, blurred vision, dilated pupils, hallucinations, vertigo, weakness, ataxia
- **Resp:** thickened bronchial secretions
- **CV:** ↑ HR; ↓ BP
- **GI:** Dry mouth, N/V

### DOPAMINE (Intropin)

- **Beta (β) dose:** 2-10 mcg/kg/min (start at 5)
- **Alpha (α) dose:** 10 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥ 65)

**Onset:** within 5 min

- Use lowest dose to minimize SE
- Use large vein and IV patency before infusing

**Indications for EMS:**
- Cardiogenic shock; bradycardia and/or ROSC w/ hypotension
- **β dose:** ↑ HR; SV, contractility; SBP, CO; & renal blood flow
- **α dose:** above cardiac effects plus vasoconstriction; ↑ SVR, preload, afterload, & ↑ BP; ↓ renal blood flow (high dose)

**Contraindications (allergy in all drugs)/Precautions:**
- Tachydysrhythmias (↓ BP due to rate problem)
- Adrenal tumor

**Interactions:**
- Deactivated by alkaline solutions

**Use w/ caution:**
- Occlusive vasc. disease
- Hypovolemic shock
- Pressors not a substitute for hemostasis & IVF replacement

### EPINEPHRINE (Adrenalin)

- **1mg/1mL:**
  - **Adult Emergent Allergic rxn/ critical asthma:** 0.3 mg IM
  - May repeat X 1 in 5-10 min.
  - **Adult Anaphylaxis no IV/O:** 0.5 mg IM
  - **Peds allerxy rxn/ severe asthma**: 0.01 mg/kg (0.01 mL/kg) to a max of 0.3 mg (0.3 mL) IM

**Typical dose:**
- ≥ 30 kg (66 lbs): 0.3 mg
- 15 to 29 kg (33–65 lbs): 0.15 mg
- May repeat X 1 in 5-10 min

**1mg/10mL:**
- **Adults:** Pulmonary arrest: 1 mg IVP/IO q. 3-5 min
- **Anaphylaxis:** titrate in 0.1 mg IVP/IO doses q. 1 min to a total max dose of 2 mg IM

**Indications for EMS:**
- Catecholamine; SNS agonist – dose dependent
  - **Low dose (< 0.3 mcg/kg/min)** (IM) – β-2 dominates:
    - Relaxes bronchial smooth muscle (bronchodilator); constricts bronchial arterioles (α stimulation) to relieve congestion & edema.
    - Inhibits histamine release & antagonizes effects on end organs
  - **β-1 effects**:
    - ↑ Automaticity; myocardial electrical activity
    - ↑ HR (+ chronotropic)
    - ↑ CO (+ inotropic)
    - ↑ Conduction velocity (+ dromotropic)

**High dose (> 0.3 mcg/kg/min)**
- **1mg / 1 mL**
  - Moderate allergic reaction (IM)
  - Anaphylaxis: no IV/IO: IM
  - Mod to severe asthma
  - **1mg / 10mL**
    - All pulseless arrests: VF/pulseless VT, asystole, PEA (IV/O)
    - Symptomatic bradycardia in peds
    - Severe anaphylactic reaction/ anaphylaxis IV/O
    - Severe croup/epiglottitis/ bronchiolitis/RSV (HHN)

**Contraindications:**
- VT due to cocaine use (may be considered if VF)
- None: cardiac arrest or anaphylaxis

**Precautions:**
- Give O₂, monitor ECG & VS when giving Epi

**Use IM w/ caution if:**
- HR > 100
- Hx. CVD/HTN
- Current HTN, HF
- β blockers antagonize cardiostimulating and bronchodilating effects (will produce only a effects)
- Alpha blockers antagonize vasoconstricting &

**Side Effects:**
- Elderly at higher risk for SE
- **CNS:** HA, dizziness
- **CV:** ↑ HR; palpitations, ectopy, ↑ O₂ demand; risk of ACS, dysrhythmias, vasoconstriction
- **Resp:** SOB
- **Eyes:** dilated pupils
- **Skin:** may cause tissue necrosis if infiltrates; notify hospital ASAP
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<tbody>
<tr>
<td>ETOMIDATE</td>
<td>0.5 mg/kg IVP/IO</td>
<td>Sedative-hypnotic without analgesic activity; effects are dose related</td>
<td>Drug assisted intubation</td>
<td>Contraindications</td>
<td>MS: Myoclonus</td>
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<tr>
<td>(Amidate)</td>
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<td>Light sleep to unconscious</td>
<td>Alternative: Ketamine</td>
<td>- Septic shock d/t adrenal suppression</td>
<td>Resp: Hyper/hypoventilation; apnea; laryngospasm</td>
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<td>Time to effect: 15-45 sec</td>
<td>Alternative:</td>
<td>- Children less than 10 yrs</td>
<td>CV: HTN or ↓ BP; ↑ or ↓ HR</td>
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<td>Duration: Dose dependent; usually 3-12 min</td>
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<td>Precautions:</td>
<td>GI: N/V</td>
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<td>- Pregnancy (benefit/risk)</td>
<td>Adrenal suppression</td>
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<td>- Use large proximal vein to reduce pain at inj site</td>
<td>(↓ cortisol levels)</td>
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<td>SE more likely w/ ↓ renal function</td>
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<tr>
<td>FENTANYL Citrate</td>
<td>1 mcg/kg (round to nearest 5 mcg) up</td>
<td>Sedative-hypnotic without analgesic activity; effects are dose related</td>
<td>Drug assisted intubation</td>
<td>Contraindications</td>
<td>Resp: hypoventilation; SpO2 &lt; 90% on 15 L O2</td>
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<td>to 100 mcg</td>
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<td>Alternative: Ketamine</td>
<td>- Intolerance to opiates</td>
<td>CV: Bradycardia (reverse w/ atropine), hypotension</td>
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<td>May repeat once in 5 min: 0.5 mcg/kg</td>
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<td>- AMS (GCS &lt;15) or mentation not approp for age/usual state</td>
<td>CNS: GCS &lt; 15; sedation, confusion, dizziness, euphoria, seizures</td>
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<td>(max 50 mcg) to a total of 1.5 mcg/kg/SOP.</td>
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<td>- Respiratory depression</td>
<td>Uncommon</td>
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<td>Elderly (&gt;65), debilitated or SCI: 0.5 mcg/kg</td>
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<td>- Hypotension</td>
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<td></td>
<td>0.5 mcg/kg (max 50 mcg)</td>
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<td>- Acute/severe asthma</td>
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<td>Additional doses require</td>
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<td></td>
<td>- Myasthenia Gravis</td>
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<td></td>
<td></td>
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<td>- Intermittent pain</td>
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<td></td>
<td></td>
<td>- Patients on depressant drugs</td>
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<td>OLMC</td>
<td>May repeat 0.5 mcg/kg q. 5 min to total of 3 mcg/kg (300 mcg) pm &amp; if available. Elderly/debilitated/SCI may be susceptible to adverse effects (resp depression &amp; CV effects) &amp;/or have kidney or liver dysfunction resulting in lower clearance rates. Pts on chronic opioid therapy/ Hx opioid abuse may need higher doses to achieve adequate therapeutic effect.</td>
<td>vasodilation, tachycardia, and itching. Fentanyl better for STEMI. Goal: Pain is tolerable upon ED arrival or all pain relieving options have been exhausted or pain meds are contraindicated Assess/document response; reassess VS &amp; pain severity after each dose. Can reverse with naloxone practice, risks/benefits of each strategy. Provide individualized pain mg &amp; regardless of transport interval. The safety of FENTANYL in children younger than two years of age has not been established. Call OLMC. Alternatives: Morphine, Ketamine</td>
<td>PRECAUTIONS: Avoid over sedation COPO - resp depression Concurrent use of alcohol, benzos, drugs of abuse Cardio Hx: bradydysrhythmias or those given amiodarone or Verapamil Liver or kidney Dx: ↓ hepatic metabolism &amp; renal excretion. Pregnant women (Cat C) Uncontrolled hypothyroidism</td>
<td>GI: N/V (give ondansetron) MS: Muscle rigidity, myoclonic movements - Hives, itching, abd pain, flushing - Blurred vision, small pupils - Laryngospasm, diaphoresis, spasm of the sphincter of Oddi Anaphylaxis</td>
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<tr>
<td>GLUCAGON [BLS: IN, IM] GlucaGen: reconstitute by adding 1 mL sterile water for inj Lilly: Use only 1 mL diluent to reconstitute; do not use diluent w/other drugs When reconstituting: Roll (don't shake) vial; do not mix with NS</td>
<td>Adult: 1 mg IM, IN Anaphylaxis/bradycardia on β blockers &amp; refractory to usual Rx/β blocker OD 1 mg IVP/IO/IM/IN Peds: ≥ 20 kg: 1 mg IVP/IN/IO/IM ≤ 20 kg: 0.03 mg/kg (0.5 mg) IM/IN/IO up to 1 mg &lt; 6 yrs: use mid-anterior/ lateral thigh for IM inj.</td>
<td>Class: Hormone produced using rDNA technology ↑ blood glucose by converting liver glycogen stores to glucose - Cardiac stimulant (+ inotrope) - causes release of catecholamines &amp; stimulates c-AMP in cells to ↑ cardiac output - Relaxes GI smooth muscle Onset IM: 5-20 min Peaks within 30 min Duration: 60-90 min</td>
<td>Hypoglycemia w/o IV/IO Anaphylaxis if a Hx of CVD, HTN, pregnant or on β blockers Symptomatic bradycardia w/ pulse if on β-blockers &amp; unresponsive to atropine, dopamine/ norepinephrine &amp; pacing</td>
<td>Contraindications Adrenal insufficiency Adrenal tumor Precautions: Not as effective for hypoglycemia if no glycogen stores: peds, malnourished states, uremic or liver dx Give supplemental carbohydrate ASAP</td>
<td>GI: Vomiting common (protect airway before glucagon administration) ↑ HR Dyspnea</td>
</tr>
<tr>
<td>GLUCOSE GEL [BLS]</td>
<td>25 Gm orally</td>
<td>Carbohydrate Increases serum glucose level</td>
<td>Hypoglycemia in awake patients with GCS 14-15 with intact gag reflex.</td>
<td>- AMS (GCS ≤ 13) Absent gag or impaired airway reflexes Hx recent seizure activity</td>
<td>Aspiration in patients with impaired airway reflexes</td>
</tr>
<tr>
<td>HYDROXOCOBALAMIN (injection), Cyanokit Powder For Injection: 5 g/vial</td>
<td>5 gm IV (one vial) given IVPB over 15 minutes. May repeat X 1 if available and response inadequate to 1st dose. Max total dose 10 g. After mixing with liquid, may be stored for up to 6 hrs at a temp not exceed 104 F.</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 inactivates cyanide &amp; releases cyanocobalamin-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 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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<tr>
<td>IPRATROPium BROMIDE INHALATION Adult: 0.5 mg (1 Unit-Dose Vial) added to albuterol dose/HHN/in-line neb Peds (off label): 0.25-0.5 mg</td>
<td>Class: Synthetic anti-muscarinic - Anticholinergic (parasympatholytic)</td>
<td>Bronchospasm assoc. w/ Mod/severe allergic rxn COPD/Asthma</td>
<td>Precautions: Pts allergic to MDI formulation (peanut allergy) may safely use neb solution: contact OLMC</td>
<td>GI: Dry mouth, bitter taste in mouth, nausea Eyes: Blurred vision, dilated pupil (mist leak</td>
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<tr>
<td>SOLUTION, 0.02% (Atrovent)</td>
<td>added to albuterol dose/ HHN/in-line neb Onset: 15-30 min Peak: 1-2 hours Duration: 4-8 hours</td>
<td>bronchodilator w/ primarily a local, site-specific effect - Cholinergic tone often increased in pts w/ COPD</td>
<td>Considered relatively safe to use in pregnant women.</td>
<td>- Bladder neck obstruction - Prostate hypertrophy - Narrow-angle glaucoma</td>
<td>exposing eyes. Neb mouthpiece preferred over mask to avoid contact w/ eyes if glaucoma.</td>
</tr>
<tr>
<td>KETAMINE (Ketalar) Alternate Drug</td>
<td>DAI (Asthma): 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM (adult &amp; peds) Excited delirium: 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM. May repeat at ½ dose after 10 min up to max dose of 4 mg/kg (500 mg). Alt if no Fentanyl: 0.5 mg/kg slow IVP (over 1 min) or IN/IM: 1 mg/kg; May repeat at ½ dose after 10 min. IV injection -100 mg/mL concentration should be diluted w/ equal volume of NS</td>
<td>Dissociative anesthetic, produces cataleptic-like state (pt’s consciousness is dissociated from their nervous system) and profound analgesia N-methyl-D-aspartate (NMDA) receptor antagonist DEA schedule 3 controlled substance</td>
<td>Pre-DAI sedative for those with hx of asthma; peds ≤12 years Sedation for agitated or violent behavior; excited delirium Non-narcotic alternative to fentanyl and morphine After giving: minimize stimulation (verbal/auditory, tactile, visual).</td>
<td>Withhold if ↑ BP serious hazard - Hypertensive crisis - Use of methamphetamine or similar drug - Hyperthyroidism - Aortic dissection - Acute MI, angina, HF - Intracranial hemorrhage - Acute globe injury or glaucoma Rx emergence reactions w/ midazolam (standard dose for sedation), will ↓ incidence by 50% Caution in patients with schizophrenia, psychosis, or bipolar mania.</td>
<td>CV: Transient ↑ HR &amp; HTN (SBP ↑10-50%); returns to pre-med levels w/in 15 min. Benzodiazepine may decrease CV effects. CNS: Psychosis (5-30%), ↑ ICP; dysphoria MSK: Rigidity, dystonic reaction, depressed reflexes Psych: Emergence reactions: anxiety, restlessness, confusion; disorientation, auditory &amp; visual hallucinations, delirium, irrational behavior; lasting 2-24 hrs. Resp: Beta-adrenergic and vagolytic properties produce bronchodilation</td>
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<tr>
<td>LIDOCAINE 2% (xylocaine)</td>
<td>IO line: 1 mg/kg (max 50 mg) push slowly before flushing line w/ 20 mL NS IVP</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>
</tr>
<tr>
<td>MAGNESIUM SULFATE 50%</td>
<td>ADULT: Critical asthma/ Torsades/Preeclampsia: 2 Gm in16 mL NS (slow IVP) or in 50 mL NS IVPB</td>
<td>- Intracellular cation responsible for metabolic processes &amp; enzymatic reactions. Critical in</td>
<td>- Severe asthma that responds poorly to epi - Torsades de Pointes - Preeclampsia/</td>
<td>Contraindications: - Hypocalcemia - Heart block - Renal dysfunction</td>
<td>Rapid admin ↑ risk: CNS: Lightheadedness, drowsiness, sedation, confusion</td>
</tr>
<tr>
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</tbody>
</table>
| MIDAZOLAM  
(Versed)  
Concentration for IN: 10 mg / 2 mL  
If SBP ≥ 90 (MAP≥ 65):  
Adult sedation for pacing and cardioversion: 5 mg IVP/IN.  
Anxiety, muscle relaxant: 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg pm titrated to response.  
Generalized tonic clonic seizures: 2 mg increments IVP/IO q. 30-60 sec IVP/IO (0.2 mg/kg IN) up to 10 mg IVP/IO/IN titrated to stop seizure activity  
If IV/IO unable/IN contraindicated - IM: 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.  
All routes: May repeat to 20 mg pm if SBP≥ 90 (MAP≥ 65) unless contraindicated.  
Peds Anxiety/serotonin syndrome: 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (Max single dose 5 mg) q. 2 min up to 10 mg based on size, BP, response.  
Duration: 15-30 min  
If hypovolemic, elderly, debilitated, PMH chronic dx (HF/COPD); prone to ventilatory depression (SCI); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.  
Peds seizures: 0.1 mg/kg IVP/IO q. 30-60 sec (0.2 mg/kg IN/IM) (Max single dose 5 mg) up to 10 mg IVP/IN/IO/IM to stop seizure. If seizures persist: Contact OLMC for orders. | Class: Benzodiazepine  
- Sedative/hypnotic  
- CNS depressant  
- Anxiolysis (↓ anxiety)  
- Amnestic (anterograde)  
- Skeletal muscle relaxant  
Potentiates GABA (major CNS inhibitory neurotransmitter). May potentiate action of other CNS depressants (Fentanyl, alcohol) – monitor closely  
Onset  IV/IN/IO:30-60 sec (slower in doses < 0.2 mg/kg); IM 5-15 min | Procedural sedation prior to DAI and/or cardioversion  
- Generalized tonic/clonic seizure activity  
- Severe anxiety/agitation  
- Muscle relaxant for long bone fractures  
- Stimulant-induced excited delirium, ACS, tachycardia, HTN crisis; (cocaine, amphetamines, ephedrine, PCP)  
CONTRAINDICATIONS  
- Glaucoma  
- Hypotension (SBP <90)  
- Pregnancy unless seizing & unresponsive to magnesium if eclamptic  
PRECAUTIONS:  
Individualize dose based on age, SBP/MAP; weight, physical & clinical status, pathologic condition, concomitant meds, nature of indication  
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 | CV: Drowsiness, sedation, confusion, amnesia, ataxia  
Respiratory depression, arrest  
CV: Hypotension, bradycardia/tachycardia |
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<tr>
<td><strong>Morphine</strong></td>
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</tbody>
</table>
| Alternate Drug        | Adults: 2 mg increments up to 10 mg slow IV or 10 mg IM if no IV in MS trauma. If pain persists after 10 mg - contact medical control to increase dose. Peds: 0.1 mg/kg slow IVP/IM Max single dose: 2 mg Less likely to cause respiratory depression if given slowly. Reverse with naloxone | Narcotic analgesic ↓ pain and apprehension  
- ↓ adverse effects of neurohumoral activation, catecholamine release, and myocardial oxygen demand  
- CNS depressant  
- Mild veno and arterial dilator; ↓ preload & ↓ LV afterload  
- Causes histamine release | BP ≥ 90  
- Persistent pain due to ACS unresponsive to NTG  
- Acute cardiogenic pulmonary edema w/ anxiety & adequate BP after first line drugs  
- Moderate to severe pain unless contraindicated | - Multiple trauma  
- ↓ BP, volume depletion; shock  
- Use w/ caution in pts who may be preload dependent (RV infarct).  
- AMS; head injury  
- Hypovent/ resp. depression  
- Known allergy to narcotics  
- Pts on depressant drugs  
- Caution in COPD  
- Relative contraindication: severe abdominal pain w/ peritonitis | CNS: Sedation, H/A  
CV: ↓ SVR, ↓ BP, ↓ P  
Resp: Depression  
Eyes: Dry eyes, blurred vision  
GI: N/V  
Skin: rashes, itching  
**Interactions:** Depressive effects enhanced if used w/ other sedatives, hypnotics, antihistamines, antiemetics, barbs, ETOH. |
| **NALOXONE**          | (Narcan)                          |                                                                        |                                                          |                                                                                                                                                                      |                                                                              |
| (NTG)                 | **BLS-EMTs IN & IM**              | Adult: If breathing: 0.4 mg; repeat q. 30 sec until ventilations increase up to 4 mg. If apneic: 1 mg. Repeat q. 30 sec until breathing resumes up to 4 mg. All additional doses require OLMC. Peds: 0.1 mg/kg (max single dose 0.4 mg) IVP/IN/IO/IM w/ repeat doses q' 30 sec until ventilations increase up to 4 mg. | Class: Narcotic antagonist  
- Reverses effects of opiate drugs, narcotics/ synthetic narcotics  
Onset IV/IN: 1-2 min  
Onset IM: 2-10 min  
Half-life: 30-81 min  
Half-life of naloxone often shorter than half-life of narcotic; repeat doses often required. | - Narcotic/synthetic narcotic OD w/ AMS & respiratory depression  
- Coma of unknown etiology with respiratory depression (may or may not have constricted pupils) | Precautions:  
- Rapid reversal may result in opiate withdrawal syndrome – agitated, combative, uncooperative, rapid HR.  
- Give 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, combativeness, seizure (opioid antagonists stimulate the sympathetic NS)  
CV: ↑ HR, ↑ BP, dyssrhythmias  
Resp: Hyperventilation  
GI: N/V  
Rare anaphylactic reactions & flash pulmonary edema reported after naloxone use. |
|                       |                                   |                                                                        |                                                          |                                                                                                                                                                      |                                                                              |
| **NITROGLYCERIN**     | (NTG)                             | 0.4 mg tabs SL or spray  
May repeat q. 3-5 min up to 3 doses for ACS and unlimited doses for pulmonary edema as long as SBP ≥ 90/DBP > 60. (MAP ≥ 65) If SBP 90-100 start IV prior to 1st NTG: 200 mL fluid challenge if lungs clear Let tab dissolve naturally; may need to drop NS over tab if mouth is very dry | Class: Organic nitrate, vasodilating agent  
- Dilates coronary vessels, relieves vasoospasm, and ↑ coronary collateral blood flow to ischemic myocardium  
- Vascular smooth muscle relaxant; dilates veins to ↓ preload. Higher doses dilate arterioles = ↓ afterload | - ACS w/ suspected ischemic pain  
- Pulmonary edema  
- Hypertensive crisis w/ chest pain/pulmonary edema | Recent use of erectile dysfunction drugs: Viagra/Levitra (vardenafil)/w/in 24 hrs or Cialis (tadalafil)/w/in 48 hrs  
- ↑ ICP; Glaucoma  
- Peds < 18  
**Contraindications in ACS:**  
- BP < 90/60 or more than 30 mmHg below baseline  
- HR < 50 or > 100 w/o HF  
**Contraindications in HF:**  
- BP < 90/60  
Use w/ caution not at all in preload dependent pts OLMC | CNS: Headache, dizziness, poss. syncope  
CV: Hypotension (postural often transient; responds to NS)  
With evidence of AMI: Limit BP drop to 10% if normotensive, 30% if hypertensive, avoid drop <90.  
GI: SL admin – burning, tingling  
Flushed skin  
Methemoglobinemia |
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| **NOREPINEPHRINE bitartrate** | **Initial dose**: Add 4 mg (4 mL) of Levophed (1 amp) to 1,000 mL DSW or NS. Concentration of drip: 4 mcg/mL 8 mcg/min (2 mL/min), adjust upwards in 2 mcg/min (0.5 mL/min) increments to max of 20 mcg/min to reach/ maintain SBP 90 (MAP ≥ 65). IV should be infusing into a large vein (AC); use caution in administration to avoid infiltration Septic shock may need higher doses.  
**Maintenance**: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR 0.03 mg IV with caution | Catecholamine, synthesized, stored, and released from sympathetic neurons: Vasopressor acts on both α₁ and α₂ adrenergic receptors to cause vasoconstriction and an increase in peripheral vascular resistance. Beta 1 stimulant: ↑HR & CO  
Retake BP every 2 min from time drug is started until desired BP reached, then every 5 min ✓ infusion site frequently for patency. Avoid extravasation – inform hospital ASAP if it occurs. | Patients with severe hypotension (MAP < 60)  
Pressor agent used mainly to treat patients in vasodilatory shock states such as septic and neurogenic shock, while showing fewer adverse side-effects compared to dopamine Safety and effectiveness in peds pts has not been proven. Call OLMC prior to giving Pregnancy: May have adverse effects on fetus, call OLMC | Hypovolemic shock  
Do not give NaHCO₃ in IV line containing norepinephrine  
Cautions:  
- Pts receiving monoamine oxidase inhibitors (MAOI) or antidepressants of the triptyline or imipramine types - severe, prolonged HTN may result.  
- Asthma; -bisulfite sensitivity  
At high doses, and especially when combined with other vasopressors, it can lead to limb ischemia and limb death  
CV: Severe HTN; tachycardia. arrhythmias; severe peripheral and visceral vasoconstriction, ↓ renal perfusion and urine output, poor systemic blood flow despite "normal" BP, tissue hypoxia, and lactic acidosis  
CNS: Anxiety, confusion, HA (if HTN results), tremor  
Resp: Dyspnea with or w/o respiratory difficulty  
Skin: Sweating, extravasation necrosis at injection site. |                                                                                     |
| **NORMAL SALINE** (0.9% NaCl) | **TKO**: 15-30 gtts/min  
**Fluid challenges**: 200 mL increments repeated to achieve/ maintain hemodynamic stability  
**Sepsis**: 200 mL IV boluses in rapid succession (max 30 mL/kg) to SBP ≥ 90 (MAP ≥ 65)  
**Peds**: 20 mL/kg IVP; may repeat X 2 pm | Class: Isotonic crystalloid  
Contains 154 mEq/L Na ions  
154 mEq/L Cl ions | - Need for IV medications  
- Volume replacement | Precautions:  
Limit volume in pts w/ HF Limit volume to BP targets in trauma | Fluid overload if excess volume/infused too rapidly.  
Pulmonary edema  
- pH is low: acidosis with high chloride load if given in large volumes |
| **NITROUS OXIDE** (Nitronox, Entonox) | 50% nitrous oxide and 50% oxygen; self-administered by mask | Class: Analgesic gas  
- CNS depressant  
- Alters perception of pain  
Onset: 2-5 min  
Short duration: 2-5 min | - Pain relief from musculoskeletal trauma, burns, kidney stones  
- May use to reduce procedural anxiety (IV access) | - AMS; ETOH/drug ingestion  
- TBI / facial / chest trauma (pneumothorax)  
- Bowel obstruction  
- Pregnant females  
**Precaution**:  
- COPD – risk of pneumothorax  
- Use in well ventilated area | Dizziness, light headedness  
Drowsiness / sedation  
Bizarre behavior  
Slurred speech  
Numbness/tingling in face  
H/A; N/V |
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<td><strong>ONDANSETRON</strong> (Zofran)</td>
<td>BLS- ODT Adults: 4 mg oral dissolve tablet or 4 mg IVP over no less than 30 sec. May repeat in 10 min to a total of 8 mg PO or IVP. Peds: 0.15mg/kg up to a total of 4 mg IVP or ODT</td>
<td>Selective 5-HT3 (serotonin) receptor antagonist Antiemetic May precipitate at stopper/vial interface; vigorous shaking will resolubilize</td>
<td>Nausea/vomiting</td>
<td>Phenyketonuria (PKU): ODT contains aspartame that forms phenylalanine Don't push ODT through blister pkg; tabs are fragile</td>
<td>Rare: Transient blurred vision after rapid IV infusion Headache, lightheadedness Sedation Nausea/vomiting Diarrhea in children</td>
</tr>
<tr>
<td><strong>SODIUM BICARBONATE inj. 8.4% (NaHCO₃)</strong></td>
<td>Cyclic antidepressant OD: 1 mEq/kg (1 mL/kg) IVP/IO Repeat dose if ↓ BP, AMS, QRS ≥ 0.12 sec, or dysrhythmias Dialysis/renal failure arrest: 50 mEq slow IVP/IO over 5 min. Crush syndrome: 50 mEq slow IVP over 5 min followed by 20 mL NS IV flush</td>
<td>Class: Alkalinating agent - buffers acids &amp; - Raises serum pH - ↓ uptake of cyclic antidepressants - Shifts K into cells</td>
<td>Notes: ✔ IV patency before infusing. Flush IV line before &amp; after administration</td>
<td>- Alkalosis - Inability to ventilate Not useful or effective in hypercarbic acidosis (cardiac arrest and CPR w/ effective ventilations) - Incompatible with catecholamines or Ca agents in same IV line</td>
<td>Electrolyte: Metabolic alkalosis, ↑ Na, ↓ K, hyperosmolality, ↓ Ca, shifts oxyhb dissociation curve to left, inhibits O2 release to tissues. CV: ↓ VF threshold; impaired cardiac function Skin: Extravasation may cause chemical cellulitis, necrosis, tissue sloughing</td>
</tr>
<tr>
<td><strong>TETRACAINE</strong> (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><strong>TORADOL</strong></td>
<td>Age 16-64: 30 mg IVP; Age ≥ 65: 15 mg IVP unless contraindicated</td>
<td>Non-steroidal anti-inflammatory agent for pain</td>
<td>Possible kidney stone</td>
<td>Age &lt; 16; bleeding ulcers, GI bleed, recent surgery, allergy to NSAIDS</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>
<tr>
<td><strong>VERAPAMIL</strong></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>Calcium channel blocker - Slows depolarization of slow-channel electrical cells - Slows conduction through AV node to control vent. rate assoc. with rapid atrial rhythms - Relaxes vascular smooth muscle - Dilates coronary arteries</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)</td>
<td>Contraindications - ↓ BP; HF, shock - Wide complex tachycardias of uncertain origin &amp; poisoning/drug-induced tachycardia - 2º-3º AVB w/o funct. pacemaker; VT - WPW, short PR &amp; sick sinus syndromes - Hypersensitivity - Peds</td>
<td></td>
</tr>
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<tr>
<td></td>
<td></td>
<td>↓ afterload &amp; myocardial contractility</td>
<td>- Angina based on OLMC order</td>
<td>Precautions: - May ↓ BP if used w/ IV or oral β blockers, nitrates, quinidine</td>
<td></td>
</tr>
<tr>
<td>Weight (lbs)</td>
<td>Dose mg / mL</td>
<td>Dose mg / mL</td>
<td>Dose mg / mL</td>
<td>Dose mcg / mL</td>
<td>Dose mg / mL</td>
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<td>--------------</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>
</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>
</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>
</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>
</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>
</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>
</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>
</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 = 1 mL</td>
<td>250 mg = 0.5 mL</td>
<td>2 mg = 0.4 mL</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>
</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></td>
<td>325 mg = 0.65 mL</td>
<td>2.5 mg = 0.5 mL</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>0.14 mg = 1.4 mL</td>
<td>350 mg = 0.7 mL</td>
<td>2 mg = 1 mL</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>0.15 mg = 1.5 mL</td>
<td>375 mg = 0.75 mL</td>
<td>3 mg = 0.6 mL</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 = 1.5 mL</td>
<td>400 mg = 0.8 mL</td>
<td>2.4 mg = 1.2 mL</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>0.18 mg = 1.8 mL</td>
<td>450 mg = 0.9 mL</td>
<td>3.6 mg = 0.7 mL</td>
</tr>
<tr>
<td>38 lbs = 17 kg</td>
<td>87.5 mg = 1.7 mL</td>
<td>0.35 mg = 3.5 mL</td>
<td>0.2 mg = 2 mL</td>
<td>500 mg = 1 mL</td>
<td>4 mg = 0.8 mL</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>0.22 mg = 2.2 mL</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 = 2 mL</td>
<td>500 mg = 1 mL</td>
<td>4 mg = 0.8 mL</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></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></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>0.25 mg = 2.5 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57 lbs = 26 kg</td>
<td>130 mg = 2.6 mL</td>
<td>Max single dose</td>
<td>0.26 mg = 2.6 mL</td>
<td></td>
<td>Max single dose</td>
</tr>
<tr>
<td>62 lbs = 28 kg</td>
<td>140 mg = 2.8 mL</td>
<td></td>
<td>0.28 mg = 2.8 mL</td>
<td>700 mg = 1.4 mL</td>
<td>4 mg = 2 mL</td>
</tr>
<tr>
<td>66 lbs = 30 kg</td>
<td>150 mg = 3 mL</td>
<td></td>
<td>0.3 mg = 3 mL</td>
<td>30 mcg = 0.6 mL</td>
<td>0.3 mg = 3 mL</td>
</tr>
<tr>
<td>70 lbs = 32 kg</td>
<td>160 mg = 3.2 mL</td>
<td>Max single dose</td>
<td>0.32 mg = 3.2 mL</td>
<td></td>
<td>Max single dose</td>
</tr>
<tr>
<td>75 lbs = 34 kg</td>
<td>170 mg = 3.4 mL</td>
<td></td>
<td>0.34 mg = 3.4 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79 lbs = 36 kg</td>
<td>180 mg = 3.6 mL</td>
<td></td>
<td>0.36 mg = 3.6 mL</td>
<td>900 mg = 1.8 mL</td>
<td></td>
</tr>
<tr>
<td>84 lbs = 38 kg</td>
<td>190 mg = 3.8 mL</td>
<td></td>
<td>0.38 mg = 3.8 mL</td>
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<td></td>
</tr>
<tr>
<td>88 lbs = 40 kg</td>
<td>200 mg = 4 mL</td>
<td></td>
<td>0.4 mg = 4 mL</td>
<td>1 Gm = 2 mL</td>
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</tr>
<tr>
<td>99 lbs = 45 kg</td>
<td>225 mg = 4.5 mL</td>
<td></td>
<td>0.45 mg = 4.5 mL</td>
<td>1.12 Gm = 2.2 mL</td>
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</tr>
<tr>
<td>101-128 lbs/50-58 kg</td>
<td>250 mg = 5 mL</td>
<td>50 mcg = 1 mL</td>
<td>0.5 mg = 5 mL</td>
<td>1.25 Gm = 2.4 mL</td>
<td></td>
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### Peds CARDIOVERIONS /DEFIBRILLATION J/kg

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<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>
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<td>5</td>
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<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>
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<td>44</td>
<td>88</td>
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<td>53 lbs = 24 kg</td>
<td>12</td>
<td>24</td>
<td>48</td>
<td>96</td>
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<td>57 lbs = 26 kg</td>
<td>13</td>
<td>26</td>
<td>52</td>
<td>104</td>
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<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>
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<td>80</td>
<td>160</td>
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<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>

### Peds KETAMINE (50 mg/mL concentration)
**Calculated at 1 mg/kg dose***

*Alt if no Fentanyl: 0.5 mg/kg slow IV (over 1 min) or IN/IM: 1 mg/kg*

DAI/excited delirium: IV P DOUBLE these doses to 2 mg/kg; IM/IN: multiply X 4

### Dextrose 10% (25 g/250 mL) (0.1 g/1 mL)
Peds dose 0.5 g/kg (5 mL/kg) max initial dose 25 g

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose g = mL</th>
<th>Weight</th>
<th>Dose g = mL</th>
<th>Weight</th>
<th>Dose g = mL</th>
</tr>
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<tbody>
<tr>
<td>6.6 lbs = 3 kg</td>
<td>1.5 g = 15 mL</td>
<td>59.4 lbs = 27 kg</td>
<td>13.5 g = 135 mL</td>
<td></td>
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</tr>
<tr>
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<td>2 g = 20 mL</td>
<td>61.6 lbs = 28 kg</td>
<td>14 g = 140 mL</td>
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</tr>
<tr>
<td>11 lbs = 5 kg</td>
<td>2.5 g = 25 mL</td>
<td>63.8 lbs = 29 kg</td>
<td>14.5 g = 145 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.2 lbs = 6 kg</td>
<td>3 g = 30 mL</td>
<td>66 lbs = 30 kg</td>
<td>15 g = 150 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.4 lbs = 7 kg</td>
<td>3.5 g = 35 mL</td>
<td>68.2 lbs = 31 kg</td>
<td>15.5 g = 155 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.6 lbs = 8 kg</td>
<td>4 g = 40 mL</td>
<td>70.4 lbs = 32 kg</td>
<td>16 g = 160 mL</td>
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<td></td>
</tr>
<tr>
<td>19.8 lbs = 9 kg</td>
<td>4.5 g = 45 mL</td>
<td>72.6 lbs = 33 kg</td>
<td>16.5 g = 165 mL</td>
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<td></td>
</tr>
<tr>
<td>22 lbs = 10 kg</td>
<td>5 g = 50 mL</td>
<td>74.8 lbs = 34 kg</td>
<td>17 g = 170 mL</td>
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<td></td>
</tr>
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<td>24.2 lbs = 11 kg</td>
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<td>77 lbs = 35 kg</td>
<td>17.5 g = 175 mL</td>
<td></td>
<td></td>
</tr>
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<td>26.4 lbs = 12 kg</td>
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<td>18 g = 180 mL</td>
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</tr>
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<td>6.5 g = 65 mL</td>
<td>81.4 lbs = 37 kg</td>
<td>18.5 g = 185 mL</td>
<td></td>
<td></td>
</tr>
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<td>30.8 lbs = 14 kg</td>
<td>7 g = 70 mL</td>
<td>83.6 lbs = 38 kg</td>
<td>19 g = 190 mL</td>
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<td></td>
</tr>
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</tr>
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<td>20 g = 200 mL</td>
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<td>90.2 lbs = 41 kg</td>
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<tr>
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<td>9.5 g = 95 mL</td>
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<td>10 g = 100 mL</td>
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<td></td>
</tr>
<tr>
<td>46.2 lbs = 21 kg</td>
<td>10.5 g = 105 mL</td>
<td>99 lbs = 45 kg</td>
<td>22.5 g = 225 mL</td>
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<td>11 g = 110 mL</td>
<td>101.2 lbs = 46 kg</td>
<td>23 g = 230 mL</td>
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<td></td>
</tr>
<tr>
<td>50.6 lbs = 23 kg</td>
<td>11.5 g = 115 mL</td>
<td>103.4 lbs = 47 kg</td>
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</tr>
<tr>
<td>52.8 lbs = 24 kg</td>
<td>12 g = 120 mL</td>
<td>105.6 lbs = 48 kg</td>
<td>24 g = 240 mL</td>
<td></td>
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</tr>
<tr>
<td>55 lbs = 25 kg</td>
<td>12.5 g = 125 mL</td>
<td>107.8 lbs = 49 kg</td>
<td>24.5 g = 245 mL</td>
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<td>13 g = 130 mL</td>
<td>110 lbs = 50 kg</td>
<td>25 g = 250 mL</td>
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</table>

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<thead>
<tr>
<th>Weight</th>
<th>Dose g = mL</th>
<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>3 mg = 0.06 mL</td>
<td>30.8 lbs = 14 kg</td>
<td>14 mg = 0.28 mL</td>
<td>52.8 lbs = 24 kg</td>
<td>24 mg = 0.48 mL</td>
</tr>
<tr>
<td>8.8 lbs = 4 kg</td>
<td>4 mg = 0.08 mL</td>
<td>33 lbs = 15 kg</td>
<td>15 mg = 0.3 mL</td>
<td>55 lbs = 26 kg</td>
<td>25 mg = 0.5 mL</td>
</tr>
<tr>
<td>11 lbs = 5 kg</td>
<td>5 mg = 0.1 mL</td>
<td>35.2 lbs = 16 kg</td>
<td>16 mg = 0.32 mL</td>
<td>57.2 lbs = 26 kg</td>
<td>26 mg = 0.52 mL</td>
</tr>
<tr>
<td>13.2 lbs = 6 kg</td>
<td>6 mg = 0.12 mL</td>
<td>37.4 lbs = 17 kg</td>
<td>17 mg = 0.34 mL</td>
<td>59.4 lbs = 27 kg</td>
<td>27 mg = 0.54 mL</td>
</tr>
<tr>
<td>15.4 lbs = 7 kg</td>
<td>7 mg = 0.14 mL</td>
<td>39.6 lbs = 18 kg</td>
<td>18 mg = 0.36 mL</td>
<td>61.6 lbs = 28 kg</td>
<td>28 mg = 0.56 mL</td>
</tr>
<tr>
<td>17.6 lbs = 8 kg</td>
<td>8 mg = 0.16 mL</td>
<td>41.8 lbs = 19 kg</td>
<td>19 mg = 0.38 mL</td>
<td>63.8 lbs = 29 kg</td>
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</tr>
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<td>9 mg = 0.18 mL</td>
<td>44 lbs = 20 kg</td>
<td>20 mg = 0.4 mL</td>
<td>66 lbs = 30 kg</td>
<td>30 mg = 0.6 mL</td>
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<td>10 mg = 0.2 mL</td>
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<td>21 mg = 0.42 mL</td>
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<td>24.2 lbs = 11 kg</td>
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<td>48.4 lbs = 22 kg</td>
<td>22 mg = 0.44 mL</td>
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<td>13 mg = 0.26 mL</td>
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<td>23 mg = 0.46 mL</td>
<td>90.2 lbs = 41 kg</td>
<td>41 mg = 0.82 mL</td>
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<tr>
<td>50.6 lbs = 23 kg</td>
<td>23 mg = 0.46 mL</td>
<td>90.2 lbs = 41 kg</td>
<td>41 mg = 0.82 mL</td>
<td>110 lbs = 50 kg</td>
<td>50 mg = 1 mL</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;

may repeat 0.5 mcg/kg in 5 min (max 50 mcg)

Elderly (>65), debilitated, SCI: 0.5 mcg/kg (max 50 mcg)

Contact OLMC for children < 2 and higher doses

<table>
<thead>
<tr>
<th>Weight</th>
<th>1 mcg/kg</th>
<th>0.5 mcg/kg</th>
<th>2 mcg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>132 - 150 lbs = 60-68 kg</td>
<td>60 mcg  = 1.2 mL</td>
<td>30 mcg  = 0.6 mL</td>
<td>120-136 mg = 2.4-2.6 mL</td>
</tr>
<tr>
<td>154 - 172 lbs = 70-78 kg</td>
<td>70 mcg  = 1.4 mL</td>
<td>35 mcg  = 0.7 mL</td>
<td>140-156 mg = 2.8-3 mL</td>
</tr>
<tr>
<td>176 - 194 lbs = 80-88 kg</td>
<td>80 mcg  = 1.6 mL</td>
<td>40 mcg  = 0.8 mL</td>
<td>160-176 mg = 3.2-3.5 mL</td>
</tr>
<tr>
<td>198 - 216 lbs = 90-98 kg</td>
<td>90 mcg  = 1.8 mL</td>
<td>45 mcg  = 0.9 mL</td>
<td>180-196 mg = 3.6-3.8 mL</td>
</tr>
<tr>
<td>220-238 + lbs = 100-108 kg</td>
<td>100 mcg = 2 mL</td>
<td>50 mcg = 1 mL</td>
<td>200-216 mg = 4-4.4 mL</td>
</tr>
</tbody>
</table>

### Adult Ketamine Doses

Concentration: (50 mg/mL)

***Calculated at 2 mg/kg***

Double for IM/IN

Max dose: 500 mg

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<th>Temperature</th>
<th>°C</th>
<th>°F</th>
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</thead>
<tbody>
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<td>0.5 mcg/kg</td>
<td>37</td>
<td>98.6</td>
</tr>
<tr>
<td>1 mcg/kg</td>
<td>36</td>
<td>96.8</td>
</tr>
<tr>
<td>2 mcg/kg</td>
<td>35</td>
<td>95</td>
</tr>
</tbody>
</table>

### Celsius (°C) to Fahrenheit (°F) Conversion

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<thead>
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<th>°F</th>
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</thead>
<tbody>
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<td>28</td>
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<tr>
<td>29</td>
<td>84.2</td>
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<td>86</td>
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</tbody>
</table>

### Additional Adult Ketamine Doses

<table>
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<tr>
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<th>Dose = Amount</th>
<th>lbs = kg</th>
<th>Dose = Amount</th>
<th>lbs = kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>242 lbs = 110 kg</td>
<td>220 mg = 4.4 mL</td>
<td>263 lbs = 130 kg</td>
<td>260 mg = 5.2 mL</td>
<td>290 mg = 5.8 mL</td>
</tr>
<tr>
<td>253 lbs = 115 kg</td>
<td>230 mg = 4.6 mL</td>
<td>297 lbs = 135 kg</td>
<td>275 mg = 5.5 mL</td>
<td>300 mg = 6 mL</td>
</tr>
<tr>
<td>264 lbs = 120 kg</td>
<td>240 mg = 4.8 mL</td>
<td>308 lbs = 140 kg</td>
<td>280 mg = 5.6 mL</td>
<td>319 lbs = 145 kg</td>
</tr>
<tr>
<td>275 lbs = 125 kg</td>
<td>250 mg = 5 mL</td>
<td>319 lbs = 145 kg</td>
<td>290 mg = 5.8 mL</td>
<td>320 lbs = 146 kg</td>
</tr>
</tbody>
</table>

### Approved Drug Routes

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

### Notes on Drug Routes

**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 during med administration.

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

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

**All IO**: put IV bag into pressure infuser

**IVP in cardiac arrest**: Follow drug w/ 20 mL NS bolus.
### Maximum QT Intervals based on Heart Rate

<table>
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<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>Men</td>
<td>Increasing</td>
<td>Women</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>
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<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-Lead ECG Indications (Angina or Anginal Equivalents):
- Discomfort (nose to navel, shoulder, arm, back)
- SOB/HF
- Palpitations
- Dysrhythmia (VT/SVT)
- Diaphoresis
- Dizziness/Syncope
- Weak/tired/fatigued

### Risk factors:
- HTN
- Smoking
- Diabetes
- Cholesterol high
- Age
- MI / HF

---

#### Lead Placement

- **V1**: 4th ICS - R of sternum
- **V2**: 4th ICS - L of sternum
- **V3**: Midway between V2 & V4
- **V4**: 5th ICS Mid-clavicular line
- **V5**: Ant-axillary line, level w/ V4
- **V6**: 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</th>
<th>Changes &amp; Infarct Locations</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>Lateral</td>
</tr>
<tr>
<td>II</td>
<td>Inferior</td>
</tr>
<tr>
<td>III</td>
<td>Inferior</td>
</tr>
<tr>
<td>aVR</td>
<td>Lateral</td>
</tr>
<tr>
<td>aVL</td>
<td>Lateral</td>
</tr>
<tr>
<td>aVF</td>
<td>Inferior</td>
</tr>
<tr>
<td>V1</td>
<td>Septal</td>
</tr>
<tr>
<td>V2</td>
<td>Septal</td>
</tr>
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<td>V3</td>
<td>Anterior</td>
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<td>V4</td>
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<td>V5</td>
<td>Lateral</td>
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<td>V6</td>
<td>Lateral</td>
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DIANA:12L card
APPROVED Acronyms and Abbreviations

A
AAA..........................................................abdominal aortic aneurysm
ACS..........................................................acute coronary syndromes
ADH..........................................................antidiuretic hormone
ADL..........................................................activities of daily living
AED..........................................................automated external defibrillator
AIDS..........................................................acquired immune deficiency syndrome
AIVR..........................................................accelerated idioventricular rhythm
ALS..........................................................Advanced Life Support
AMA..........................................................against medical advice
AMI..........................................................acute myocardial infarction
amp...........................................................ampule
AMS..........................................................altered mental status
ANS..........................................................autonomic nervous system
A/O..........................................................alert & oriented
AP............................................................anterior-posterior
APGAR.....................................................appearance, pulse, grimace, activity, respirations
ARDS.....................................................acute respiratory distress syndrome
ASAI..........................................................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
cm..........................................................centimeter
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
d3w..........................................................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
d/t..........................................................due to
Dx..........................................................diagnosis

E
ECG or EKG..................................................electrocardiogram
ECRN.....................................................Emergency Communications RN
ED..........................................................emergency department
EDD.........................................................esophageal detector device
EMS..........................................................Emergency Medical Services
EMS MD...................................................EMS Medical Director
EMSS.....................................................Emergency Medical Services System
EMT-B (EMT)...........................................Emergency Medical Technician - Basic
EMT-I......................................................Emergency Medical Technician - Intermediate
EMT-P.....................................................Emergency Medical Technician - Paramedic
EOMs......................................................extraocular movements
EOR..........................................................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 airborne mask
HF..........................................................heart failure
HHN.....................................................hand held nebulizer
HHNS.....................................................hyperosmolar hyperglycemic nonketotic syndrome
HR..........................................................heart rate
HTN.....................................................hypertension
Hx..........................................................history

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

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

K
KED..........................................................Kendrick extrication device
kg..........................................................kilogram
### Differential for SOB

<table>
<thead>
<tr>
<th>S&amp;S</th>
<th>HF/PE</th>
<th>AMI</th>
<th>COPD</th>
<th>Pneumonia</th>
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<td>SOB</td>
<td>+</td>
<td>+</td>
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<td>+</td>
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<tr>
<td>Cough</td>
<td>-/+</td>
<td>-</td>
<td>+ / early am</td>
<td>+</td>
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<tr>
<td>Sputum</td>
<td>Frothy (pink)</td>
<td>-</td>
<td>Clear</td>
<td>Yellow/green</td>
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<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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<tr>
<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>
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<tr>
<td>Chest pain duration</td>
<td>-</td>
<td>Varies; usually &gt; 20 min</td>
<td>-</td>
<td>Gradually worsening, then constant</td>
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<tr>
<td>Smoking Hx</td>
<td>+ Risk</td>
<td>+ Risk</td>
<td>Almost always</td>
<td>+/-</td>
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<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>
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<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>
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<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>
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</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

**Indications**: Alert, intact airway/ventilatory drive: acute pulmonary edema; flail chest without pneumothorax; COPD/asthma w/ severe distress; submersion incident, palliative care

**Contraindications**
- AMS; aspiration risk; inability to clear secretions; questionable ability to protect airway
- Need for immediate intubation and/or BVM ventilations, facial burns
- Consider intubation if imminent arrest, ↓ level of consciousness, severe hypotension, near-apnea, and/or copious frothy sputum
- Unstable respiratory drive; ventilatory failure
- Severe hemodynamic or ECG instability (BP ≤ 90 & DBP < 60 mmHg or MAP < 65)
- Gastric distention; impaired swallowing, persistent vomiting, active upper GI bleed; possible esophageal rupture
- Compromise of thoracic organs (penetrating chest trauma); pneumothorax
- Facial anomalies that would complicate CPAP mask seal, epistaxis
- Uncooperative pt. or those unable to tolerate mask due to extreme anxiety, claustrophobia, or pain
- Pregnant

**On-going care/monitoring**
- Reassess RR/depth & lung sounds, SpO₂, ETCO₂ q. 3-5 min after CPAP applied
- Reassess VS q. 3-5 min; if BP starts to drop, gradually titrate PEEP from 10 down to 5. If SBP < 90 (MAP <65) remove CPAP.
- Continuously monitor for signs indicating need to D/C CPAP &/or intubate

Diana: hf-03-08
### 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 weeks</td>
<td>Moderate if untreated</td>
<td>Months (in moist soil/other media)</td>
<td></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>
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<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>
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<tr>
<td>Encephalitis</td>
<td></td>
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<tr>
<td>Viral hemorrhagic Fever</td>
<td>Moderate</td>
<td>4-21 days</td>
<td>Death in 7-16 days</td>
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<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>
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<tr>
<td>Ricin</td>
<td>No</td>
<td>18-24 hours</td>
<td>Days (death w/ 10-12 d (ingestion)</td>
<td>High</td>
<td>Stable</td>
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<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>Enterotoxin</th>
<th>Ricin</th>
<th>Mycotoxins</th>
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<tbody>
<tr>
<td>Respiratory</td>
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<td>Nonproductive cough</td>
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<td>Cough with bloody sputum</td>
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<td>Weakness/prostration</td>
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<td>Progressive weakness of extremities</td>
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<td>Muscle rigidity</td>
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<td>Flaccid paralysis, usually neck</td>
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<td>Sore throat</td>
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<td>Swollen lymph nodes</td>
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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</td>
<td>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>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 OR 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 12h, AND 1 or 2 additional drugs (vancomycin, rifampin, imipenem clindamycin, chloramphenicol clarithromycin, and if susceptible penicilllin or ampicillin)</td>
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<tr>
<td>Anthrax</td>
<td>Bacillus anthracis</td>
<td>Intense itching followed by painless papular lesions, then vesicular lesions, developing into eschar surrounded by edema. Abdominal pain, nausea and vomiting, severe diarrhea, GI bleeding, and fever.</td>
<td>1 to 7 days</td>
<td>None</td>
<td>Direct contact with skin lesions may result in cutaneous infection</td>
<td>Culture blood and stool.</td>
<td>Recommendations same for pregnant women and immunocompromised persons</td>
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<tr>
<td>Botulism</td>
<td>Butulinitotoxin</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>Peripheral blood smear may demonstrate gram positive bacilli on unspun smear with sepsis</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>
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<tr>
<td>Pneumonic Plague</td>
<td>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>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>
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<tr>
<td>Small pox</td>
<td></td>
<td>Prodromal period: malaise, fever, rigors, 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>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 varicella virus from varicella.</td>
<td>Early vaccine critical (in &lt;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>
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<tr>
<td>CHEMICAL TERRORISM AGENTS AND SYNDROMES</td>
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<tr>
<td><strong>Agents:</strong> Sarin (GB); Tabun (GA); Soman (GD); Cyclohexyl Sarin (GF); VX; Novichok oxime</td>
<td><strong>Signs:</strong> Pinpoint pupils, Bronchoconstriction, Respiratory arrest, Hypersalivation, Increased secretions, Diarrhea, Decreased memory &amp; concentration, Coma; seizures</td>
<td></td>
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<tr>
<td><strong>Symptoms:</strong> Moderate exposure: Diffuse muscle cramping, runny nose, difficulty breathing, eye pain, dimming of vision, sweating, muscle tremors. High exposure: The above plus sudden loss of consciousness, seizures, flaccid paralysis (late sign)</td>
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<tr>
<td><strong>Onset:</strong> Aerosols: Seconds to minutes, Liquids: Minutes to hours</td>
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<tr>
<td><strong>Clinical Diagnostic Tests:</strong> RBC or serum cholinesterase (whole blood) Treat based on S&amp;S; lab tests for later confirmation</td>
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<tr>
<td><strong>Exposure Route and Treatment:</strong> 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 Pralidoxime chloride (2-PAM) 600-1800 mg IM or IV over 20-30 min (max 2 g IM or IV / hr). Repeat prn. Benzos to prevent seizures if &gt;4 mg atropine given; ventilatory support</td>
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<tr>
<td><strong>Differential diagnosis:</strong> Poisoning from organophosphate and carbamate pesticides may occur as a result of occupational exposure Cyanide poisoning Myasthenia gravis</td>
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<tr>
<td><strong>Nerve Agents:</strong> Cyanides: hydrogen cyanide (HCN) cyanogen chloride</td>
<td><strong>Moderate exposure:</strong> Metabolic acidosis, venous blood O2 level &gt;normal, hypotension, &quot;pink&quot; skin <strong>High exposure:</strong> Above signs plus coma, convulsions, cessation of respirations and heartbeat</td>
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<tr>
<td><strong>Symptoms:</strong> Moderate exposure: Giddiness, palpitations, dizziness, N / V, HA, eye irritation, hyperventilation, drowsiness <strong>High exposure:</strong> Immediate loss of consciousness, seizures &amp; death within 1 to 15 min</td>
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<tr>
<td><strong>Onset:</strong> Seconds to minutes, <strong>Clinical Diagnostic Tests:</strong> Pt off gassing bitter almond odor suggests cyanide Metabolic acidosis Cyanide (blood) or thiocyanate (blood or urine) levels; Treat based on S&amp;S; lab tests for later confirmation</td>
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<tr>
<td><strong>Exposure Route and Treatment:</strong> Inhalation, ingestion, &amp; dermal absorption: 100% O2 by mask/ ETI -Use IM in the field before IV access -Establish airway for oxygenation Inhalation, ingestion, &amp; dermal absorption: 100% O2 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 prn; max total dose 10 g.</td>
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<td><strong>Differential diagnosis:</strong> Similar CNS illness can result from: Industrial/occupational exposure to HCN &amp; derivatives; carbon monoxide exposure; hydrogen sulfide (H2S) exposure Sewers, animal waste, industrial sources Poisoning from nerve agents</td>
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<tr>
<td><strong>Vesicants/Blister Agents:</strong> sulfur mustard, lewisite, mustard, mustard lewisite, phosgene-oxime</td>
<td><strong>Signs:</strong> Skin erythema and blistering; watery, swollen eyes; upper airways sloughing with pulmonary edema; metabolic failure, neutrophia &amp; sepsis (esp. sulfur mustard, late in course) <strong>Symptoms:</strong> Burning, itching, or red skin Mucosal irritation (prominent tearing, and burning and redness of eyes) Shortness of breath Nausea and vomiting Lewisite, minutes; Sulfur mustard, hours to days. <strong>Clinical Diagnostic Tests:</strong> Often smell of garlic, horseradish, and/or mustard on body Oily droplets on skin from ambient sources Urine thioglycolic acid (USAMRICD)</td>
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<td><strong>Exposure Route and Treatment:</strong> Inhalation and dermal absorption Mustards no antidote For lewisite and lewisite/mustard mixtures: British Anti-Lewisite (BAL or Dimercaprol) M (rarely available) Thermal burn therapy; supportive care (respiratory support and eye care) Inhalation and dermal absorption Mustards no antidote For lewisite and lewisite/mustard mixtures: British Anti-Lewisite (BAL or Dimercaprol) M (rarely available) Thermal burn therapy; supportive care (respiratory support and eye care)</td>
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<td><strong>Differential diagnosis:</strong> Diffuse skin exposure with irritants, such as caustics, sulfur hydroxides, ammonia, etc. may cause similar syndromes Sodium hydroxide (NaOH) from trucking accidents</td>
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<tr>
<td><strong>Pulmonary/Choking Agents:</strong> phosgene, chlorine, diphosgene, chloropicrin, oxides of nitrogen, sulfur dioxide</td>
<td><strong>Signs:</strong> Pulmonary edema with some mucosal irritation (greater water solubility of agent = greater mucosal irritation) leading to ARDS or non-cardiogenic pulmonary edema Pulmonary infiltrate <strong>Symptoms:</strong> Shortness of breath Chest tightness Wheezing Laryngeal spasm Mucosal and dermal irritation and redness 1-24 hours (rarely up to 72 hours); May be asymptomatic period of hours <strong>Clinical Diagnostic Tests:</strong> No tests available but history may help identify source and exposure characteristics (majority of incidents generating exposures to humans involve trucking with labels on vehicle)</td>
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<td><strong>Exposure Route and Treatment:</strong> Inhalation No antidote Management of secretions: O2 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 Inhalation No antidote Management of secretions: O2 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>
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<td><strong>Differential diagnosis:</strong> Mucosal irritation, airway reactions, and deep lung effects depend on the specific agent, especially water solubility</td>
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<td>**Ricin (castor bean oil extract)</td>
<td><strong>Signs:</strong> Clusters of acute lung or GI injury; circulatory collapse and shock, tachobronchitis, pulmonary edema, necrotizing pneumonia <strong>Symptoms:</strong> Ingestion: Nausea, diarrhea, vomiting, fever, abdominal pain Inhalation: chest tightness, coughing, weakness, nausea, fever <strong>Clinical Diagnostic Tests:</strong> ELISA (from commercial laboratories) using respiratory secretions, serum, and direct tissue</td>
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<td><strong>Exposure Route and Treatment:</strong> Inhalation and Ingestion No antidote Support care For ingestion: charcoal lavage Inhalation and Ingestion No antidote Support care For ingestion: charcoal lavage</td>
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<td><strong>Differential diagnosis:</strong> Tularemia, plague, and Q fever may cause similar syndromes, as may biological weapons and chemical weapon agents such as Staphylococcal enterotoxin B and phosgene</td>
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<td><strong>T-2 myotoxins:</strong> Fusarium, Myrocutecium, Trichoderma, Verticinomosporium, Stachybotrys</td>
<td><strong>Symptoms:</strong> Mucosal erythema and hemorrhage (intestinal necrosis) Red skin, blistering Increased salivation Pulmonary edema Seizures and coma Liver/renal dysfunction <strong>Clinical Diagnostic Tests:</strong> ELISA from commercial laboratories</td>
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<td>Region 9 Hospitals</td>
<td>Location</td>
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<td>STEMI Center</td>
<td>Trauma Center</td>
<td>Stroke Center</td>
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<td>Alexian Brothers (Amita)</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>
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<td>Northwestern McHenry</td>
<td>4201 Medical Center Dr, McHenry</td>
<td>Resource</td>
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<td>Northwestern Huntley</td>
<td>10400 Haligus Rd, Huntley</td>
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<td>Northwestern Woodstock</td>
<td>3701 Doty Rd, Woodstock</td>
<td>Associate</td>
<td>No</td>
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<td>Delnor (Northwestern)</td>
<td>300 Randall Rd., Geneva</td>
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<td>Glen Oaks (Amita)</td>
<td>701 Winthrop, Glendale Hts</td>
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<td>Good Shepherd (Advocate)</td>
<td>450 W Highway 22, Barrington</td>
<td>Associate</td>
<td>Yes</td>
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<td>Lutheran General (Advocate)</td>
<td>1775 W Dempster, Park Ridge</td>
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<td>Mercy Med Ctr (Presence)</td>
<td>1325 N Highland Ave, Aurora</td>
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<td>Northwest Community</td>
<td>800 W. Central, Arlington Hts.</td>
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<td>Rush Copley Med Center</td>
<td>2000 Odgen Ave, Aurora</td>
<td>Associate</td>
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<td>Resurrection (Presence)</td>
<td>7435 W. Talcott, Chicago</td>
<td>Associate</td>
<td>Yes</td>
<td>No</td>
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<td>Saint Joseph (Presence)</td>
<td>77 N Airlite, Elgin</td>
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<td>Sherman (Advocate)</td>
<td>1425 N Randall Road, Elgin</td>
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<td>St. Alexius (Amita)</td>
<td>1555 Barrington Rd, Hoffman Est</td>
<td>Associate</td>
<td>Yes</td>
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<th>Region 8 Hospitals</th>
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<th>EMS designation</th>
<th>STEMI Center</th>
<th>Trauma Center</th>
<th>Stroke Center</th>
<th>EDAP</th>
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<td>Bolingbrook (Amita)</td>
<td>500 Remington Blvd, Bolingbrook</td>
<td>Associate</td>
<td>Yes</td>
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<td>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>
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<td>Edward Hospital</td>
<td>801 S Washington St, Naperville</td>
<td>Resource</td>
<td>Yes</td>
<td>2</td>
<td>*Primary</td>
<td>PCCC</td>
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<td>Elmhurst Hospital</td>
<td>York &amp; Roosevelt Rd, Elmhurst</td>
<td>Associate</td>
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<td>Yes</td>
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<td>Good Samaritan (Advocate)</td>
<td>3815 Highland, Downers Grove</td>
<td>Resource</td>
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<td>1 (adults)</td>
<td>Primary</td>
<td>Yes</td>
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<td>Gottlieb Memorial</td>
<td>675 W. North Ave, Melrose Park</td>
<td>Associate</td>
<td>Yes</td>
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<td>Stroke ready</td>
<td>Yes</td>
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<td>Hinsdale Hospital</td>
<td>120 N Oak St, Hinsdale</td>
<td>Associate</td>
<td>Yes</td>
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<td>Primary</td>
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<td>LaGrange Memorial</td>
<td>5101 S. Willow Springs, LaGrange</td>
<td>Associate</td>
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<td>Loyola Medical Center</td>
<td>2160 S. 1st Ave., Maywood</td>
<td>Resource</td>
<td>Yes</td>
<td>1; burn center</td>
<td>Primary</td>
<td>PCCC</td>
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<td>MacNeal Hospital</td>
<td>3249 S Oak Park Ave, Berwyn</td>
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<td>Primary</td>
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<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>Resource</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>NWM Lake Forest</td>
<td>660 N Westmoreland, Lake Forest</td>
<td>**Associate</td>
<td>Yes</td>
<td>2</td>
<td>Primary</td>
<td>Yes</td>
</tr>
<tr>
<td>St. Francis (Presence)</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
*Note, this may change as Edward is applying to become a Comprehensive stroke center coming.
**Note this may change as they are making application to become a Resource Hospital
### Wong-Baker FACES Pain Rating Scale

- **No Pain**
- **Mild Pain**
- **Moderate Pain**
- **Severe Pain**

- **Face**
  - No particular expression or smile
  - Occasional grimace or frown, withdrawn, disinterested
  - Frequent to constant quivering chin, clenched jaw

- **Legs**
  - Normal position or relaxed
  - Uneasy, restless, tense
  - Kicking or legs drawn up

- **Activity**
  - Lying quietly, moves easily
  - Squirming, shifting back & forth, tense
  - Ached, rigid, or jerking

- **Cry**
  - No cry (awake or asleep)
  - Moans or whispers, occasional complaint
  - Crying steadily, screams or sobs, frequent complaints

- **Consolability**
  - Content, relaxed
  - Reassured by occasional touching, hugging or being talked to, distractible
  - Difficult to console or comfort

**TOTAL**

**Score**


### FLACC Pain Scale - Children 2 mos to 7 yrs or those unable to communicate their pain.

<table>
<thead>
<tr>
<th>Category</th>
<th>Score 0</th>
<th>Score 1</th>
<th>Score 2</th>
</tr>
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<tbody>
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<td>Face</td>
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### Abbey Pain Scale

- **Vocalization**: Whimpering, moaning, groaning, crying
- **Facial expression**: Looking tense, frowning, grimacing, looking frightened
- **Change in body language**: Fidgeting, rocking, guarding part of body, withdrawn
- **Behavioral Change**: ↑ confusion, combativeness, refusing to eat, alteration in usual patterns, difficulty sleeping, increased wandering, decreased social interactions
- **Physiological change**: T, P, or BP outside normal limits, perspiring, flushing or pallor
- **Physical changes**: Skin tears, pressure areas, arthritis, contractures

0-2 No pain | 3-7 Mild | 8-13 Moderate | 14+ Severe | **Total:**

Assess if pain is acute; chronic; or acute on chronic for this patient