TREATMENT

Treatment - Section 10.000

Abdominal Pain

HX	PE	DDX
Pain: nature, duration, location, radiation, intensity Associated symptoms: fever, nausea and vomiting, diarrhea, melena, painful urination Last menstrual period Prior abdominal surgery	Distension Tenderness Guarding Rigidity Rebound Masses	Diffuse: Perforation, intraabdominal bleeding (trauma, ectopic, AAA), gastroenteritis RUQ: cholecystitis, hepatitis, pancreatitis Epigastric: peptic ulcer, pancreatitis, gastritis LUQ: spleen, pancreatitis, stomach (PUD) Flank: kidney stone, pyelonephritis RLQ: Appendicitis , kidney stone, PID, ovarian cyst, cystitis LLQ: diverticulitis, kidney stone, PID, ovarian cyst, cystitis

Treatment:

A. Start O_2, follow ***Airway Management*** procedure.
B. If shock syndrome is present and MAP < 65 mmHg (SBP < 90 mmHg), follow Shock protocol and maintain MAP 55-65 mmHg. Consider IV/IO, NS, large bore, TKO or as needed. If traumatic event, enter into trauma system. Rapid transport is of primary importance.
C. Place patient in comfortable position.
D. Do not allow patient to eat or drink.
E. Obtain vital signs frequently.

Specific Precautions:

A. Abdominal pain may be the first warning of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated viscus, etc.).
B. Since the bleeding is not apparent, you must think of **volume depletion** and monitor patient closely to recognize shock.
C. For transgender or non-binary patients, ask if any prior surgery.

Altered Mental Status and Coma

HX	PE	DDX
Onset / changes LOC Recent history: headache, nausea and vomiting, trauma Diabetes CVA Hypertension Seizure Medications Pregnancy	LOC Evidence of traumatic injury Vital signs Pupils Breath odor Nuchal rigidity Neuro deficits (weakness) Confusion	Hypoglycemia (diabetes) Hypoxia/hypercarbia/CO Shock (MI, hypovolemia) Drug/toxin Trauma Cerebrovascular (CVA, intracranial hemorrhage, infection, tumor) Metabolic (e.g., electrolyte imbalance, hypothermia, hyperthermia) Seizure (postictal) Infection (meningitis/encephalitis)

Treatment:

A. Determine level of consciousness.
B. Start O_2, follow ***Airway Management*** procedure. Unless intubated, transport on left side, if possible, to protect airway.
C. Monitor vital signs and respiratory status during transport.
D. Consider use of $EtCO_2$ to monitor ventilation.
E. Start IV/IO as needed.
F. Monitor cardiac rhythm and follow ***Cardiac Dysrhythmia*** protocol.

Consider underlying causes: Altered mental status has many causes, and may require the use of multiple protocols.

Hypoglycemia:

Determine capillary blood glucose level using blood glucose meter. If the blood glucose reading is less than 60 mg% or glucose less than 80 mg% in a known diabetic:

A. Administer glucose:

1. Do not administer oral glucose to patients without a gag reflex or with a rapidly diminishing level of consciousness.

2. If patient is unable to take sugar orally, administer dextrose 50%, 25-50 mL (in large vein) or dextrose 10%, 125-250 mL.

B. Repeat capillary blood glucose level after 10 minutes and treat if it remains low.

C. If unable to administer oral glucose or establish IV/IO, give glucagon 1 mg IM.

Overdose:

A. Follow **Poisoning and Overdose** protocol, if indicated.

B. If opioid intoxication is suspected:

1. If no IV/IO has been established, administer naloxone 2 mg IM/IN.

2. If IV/IO already established, administer naloxone 0.5 mg IV/IO and observe for improved respiration, IV/IO dose may be repeated every 2 minutes up to 2 mg.

3. In most instances, a total dose of 2 mg IM/IN or IV/IO will be sufficient to reverse opioid intoxication. In some cases (methadone or designer drugs), larger doses of naloxone may be necessary. In these cases, additional doses of naloxone (2 mg IM/IN or IV/IO every 3-5 minutes) up to a MAX of 8 mg of naloxone may be administered to reverse opioid intoxication.

4. IV/IO/IM/IN dose may be repeated every 2 minutes up to 2 mg.

5. The goal of naloxone administration is restoration of adequate ventilation, not a normal level of consciousness.

Psychiatric Disorders:

A. Almost never cause disorientation or alteration in level of consciousness. If the patient is disoriented, assume a medical cause.

B. Follow ***Psychiatric and Behavioral Disorders*** protocol.

C. If a non-organic cause of coma in adults (over age 16) is suspected, a noxious stimuli may be considered.

1. Response to noxious stimuli does not rule out medical or traumatic causes of initial coma.

2. **Never place inhalants in nostrils or inside O_2 mask.**

Seizure:

Follow ***Seizure*** protocol.

Stroke:

Follow ***Stroke/CVA*** protocol.

Toxemia:

Follow ***OB/GYN Emergencies*** protocol, if indicated.

Trauma:

A. Maintain spinal precautions.
B. If GCS score is ≤ 13, enter patient into the Trauma System.
C. Perform all treatment possible en route.
D. Maintain ventilation as per ***End-Tidal CO2 Monitoring*** protocol.
  1. Secure protected airway if GCS score is < 8.

Pediatric Considerations:

1. Consider etiology and appropriate protocols: shock, toxic exposure, head trauma (consider intentional injury), seizure.
2. Vascular access.
3. Rapid blood glucose determination. If glucose determination is less than 60 mg% (less than 40 mg% for neonates), administer oral glucose to conscious patient, OR,
   a. If no IV/IO established and airway protective reflexes are intact, administer D_{50}, or other glucose containing substance, orally.
   b. If IV/IO established, administer Dextrose 10% (5 mL/**kg**) for neonates, infants, and children, may repeat once.
   c. If no IV/IO established and airway protective reflexes are not intact, administer glucagon 0.02 mg/**kg** IM to a MAX of 1 mg.
   d. Repeat blood glucose determination and treat if it remains low.
4. If mental status and respiratory effort are depressed, administer naloxone 0.1 mg/**kg**, MAX 2 mg IV/IO/IM.
   a. **Do Not Administer naloxone to neonates.**
   b. May repeat every 5 minutes with strong suspicion of opiate overdose, or if partial response is noted.

Anaphylaxis and Allergic Reactions

HX	PE	DDX
Difficulty breathing / speaking (hoarseness) Chest tightness Subjective airway impairment or swelling Itching Exposure: Meds, insects or stings, food / toxic substance Known allergies Prior allergic reactions	LOC Edema (face, tongue, extremities) Respiratory (wheezing, hoarseness, stridor etc.) Rash, flushing, hives Hypotension/shock	Anaphylaxis Upper airway infections Angioedema (medication) Asthma (bronchospasm) Urticaria Foreign body

Treatment:

A. Protect airway; suction as needed.
  1. Follow ***Airway Management*** procedure.
  2. Cricothyrotomy may be required if unable to secure protected airway or ventilate by BVM after epinephrine has been administered.

B. Start IV/IO as needed. If shock syndrome is present and MAP < 65 mmHg (SBP < 90 mmHg), follow ***Shock*** protocol.

C. Monitor cardiac rhythm and if dysrhythmia is present, follow ***Cardiac Dysrhythmia*** protocol.

D. Assess severity of allergic reaction.
  1. Mild (Skin signs only)
    a. Diphenhydramine 1 mg/**kg** IV/IO/IM/PO to a MAX of 50 mg.
    b. Consider dexamethasone 10 mg IV/IO/IM/PO.
  2. Moderate (Advancing hives, respiratory distress, etc.)
    a. Epinephrine 1:1,000 0.3 - 0.5 mg **IM**. May repeat once in 5-15 minutes if needed.
    b. Albuterol 2.5 mg via nebulizer.
    c. Consider:
      i. Diphenhydramine 1 mg/**kg** IV/IO/IM/PO to a MAX of 50 mg.
      ii. Dexamethasone 10 mg IV/IO/IM/PO.

3. Severe (cardiovascular collapse, profound shock).
   a. Epinephrine 1:1,000 0.3 - 0.5 mg **IM**. Repeat once in 5-15 minutes if patient is still in shock **Or, if IV/IO established,**
   b. Epinephrine 1:10,000 0.1 mg boluses **IV/IO** every 3-5 min titrated to effect. MAX dose 0.5 mg.
   c. If hypotensive, fluid challenge 500–1,000 mL. Repeat once if needed.
   d. If time permits consider:
      i. Albuterol 2.5 mg via nebulizer.
      ii. Diphenhydramine 1 mg/**kg** IV/IO/IM/PO to a MAX of 50 mg.
      iii. Dexamethasone 10 mg IV/IO/IM/PO.

E. SPECIAL NOTE:
1. If 1:10,000 not available, you may dilute 1 mL of 1:1,000 epinephrine with 9 mL of NS (1 mg/10 mL) and administer 1 mL IV or IO.

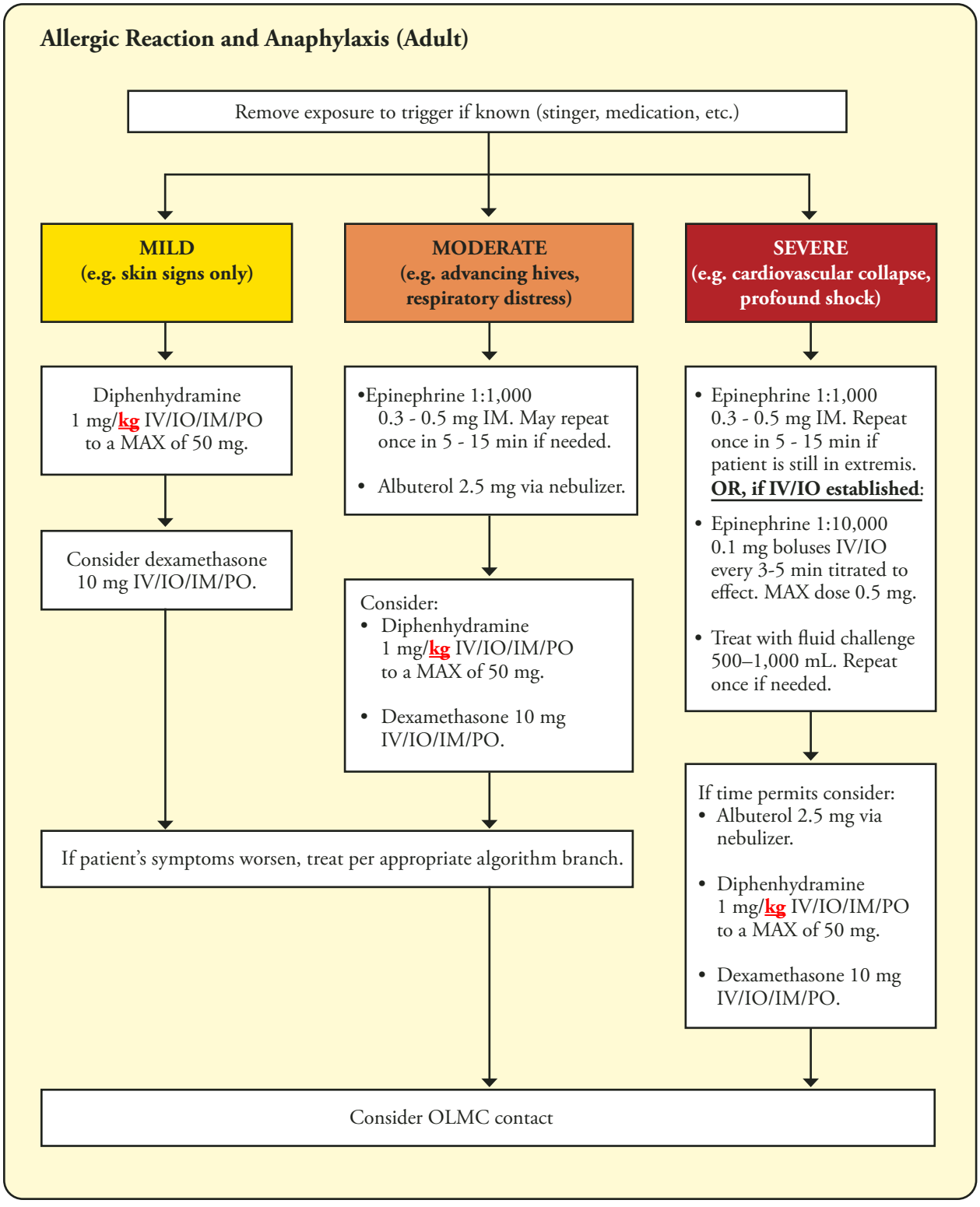
Pediatric Considerations:

1. **Mild Reaction (Skin Signs Only)**
   - **a.** Diphenhydramine 1 mg/**kg** IV/IO/IM/PO to a MAX of 50 mg.
   - **b.** Consider dexamethasone 0.6 mg/**kg** IV/IO/IM/PO to a MAX of 10 mg.
2. **Moderate Reaction (Respiratory Signs)**
   - **a.** Epinephrine 1:1,000. Administer 0.01 mg/**kg** IM to a MAX of 0.5 mg. May repeat once in 5-15 minutes if needed.
   - **b.** Albuterol 2.5 mg via nebulizer.
   - **c.** Consider:
     - **i.** Diphenhydramine 1 mg/**kg** IV/IO/IM/PO to a MAX of 50 mg.
     - **ii.** Dexamethasone 0.6 mg/**kg** IV/IO/IM/PO to a MAX of 10 mg.
3. **Severe Reaction Shock (BP < for Age)**
   - **a.** Epinephrine 1:1,000. Administer 0.01 mg/**kg** IM to a MAX of 0.5 mg. Repeat once in 5-15 minutes if patient is still in severe shock.

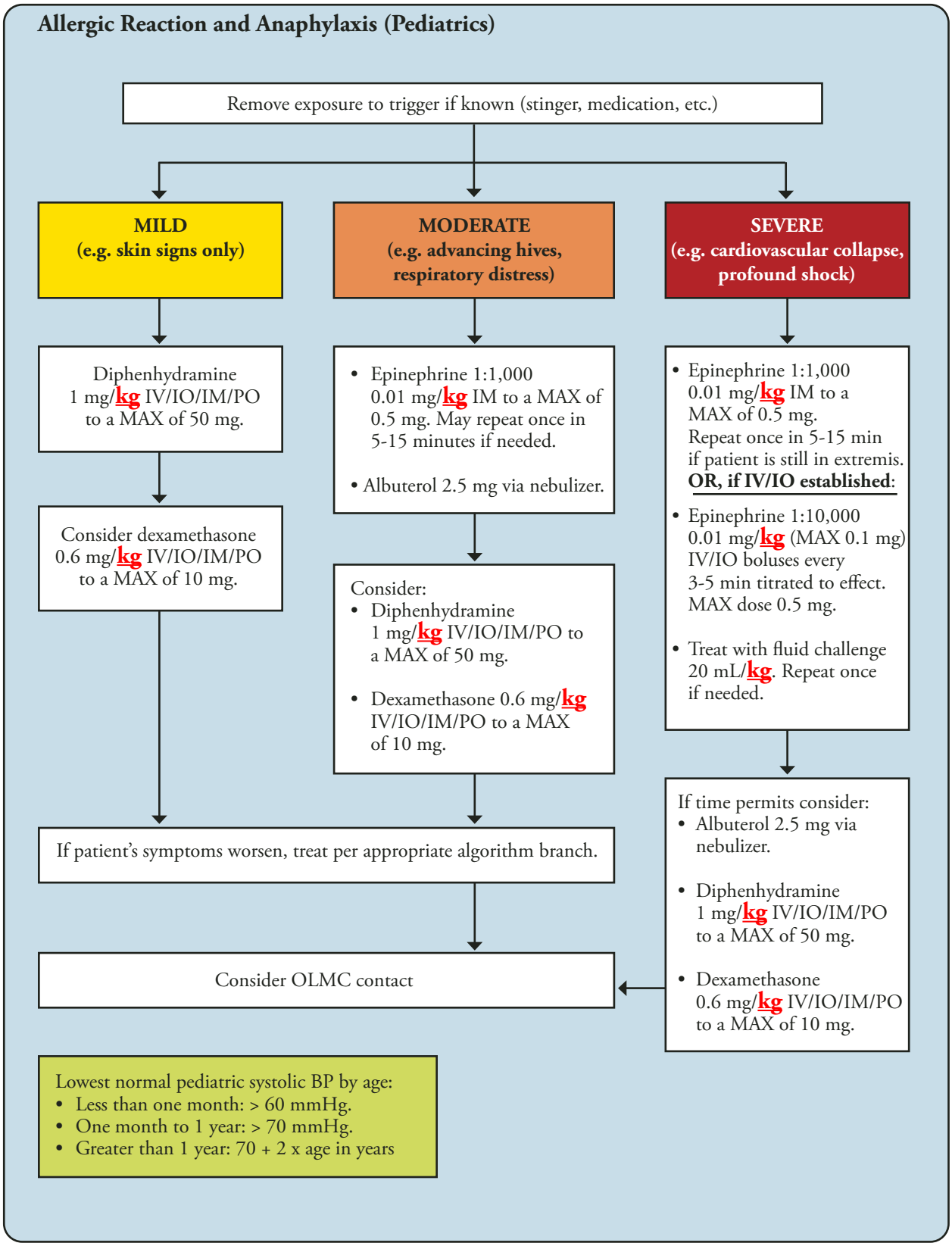
   Or, if IV/IO established:

   - **b.** Epinephrine 1:10,000. Administer 0.01 mg/**kg** (MAX 0.1 mg) IV boluses every 3-5 min titrated to effect. MAX total dose 0.5 mg.
   - **c.** Treat with fluid challenge 20 mL/**kg**. Repeat once if needed.
   - **d.** If time permits consider:
     - **i.** Albuterol 2.5 mg via nebulizer.
     - **ii.** Diphenhydramine 1 mg/**kg** IV/IO/IM/PO to a MAX of 50 mg.
     - **iii.** Dexamethasone 0.6 mg/**kg** IV/IO/IM/PO to a MAX of 10 mg.
4. **Lowest normal pediatric systolic BP by age:**
   - **a.** Less than one month: > 60 mmHg.
   - **b.** One month to 1 year: > 70 mmHg.
   - **c.** Greater than 1 year: 70 + 2 x age in years.

Allergic Reaction and Anaphylaxis (Adult)



Allergic Reaction and Anaphylaxis (Pediatrics)



Specific Precautions:

A. Epinephrine should not be given unless signs of cardiovascular or respiratory distress are present.

B. Preferred location for IM administration, if feasible, is the mid-anterolateral aspect of thigh.

C. Common side effects include anxiety, tremor, palpations, tachycardia, and headache.

D. Acute coronary syndromes (angina, myocardial infarction, arrhythmias) may occur in both treated and untreated patients of all age groups.

E. Patients presenting with anaphylaxis who are on beta-blockers and ACE inhibitors may have a more severe anaphylaxis presentation and more adverse effects with epinephrine treatment.

1. Epinephrine administered to a patient taking beta-blockers may produce unopposed alpha-adrenergic and reflex vagotonic effects, possibly leading to severe hypertension and the risk of cerebral hemorrhage.
2. Anaphylaxis in a patient on beta-blockers may present with severe bronchospasm, profound hypotension and bradycardia.
3. If epinephrine is ineffective in treating anaphylaxis in patients taking beta-blockers, both glucagon administration (1-5 mg in adults, 20-30 microgram/**kg** (MAX 1 mg) in children (OLMC required) and isotonic volume expansion (in some circumstances, up to several liters of crystalloid) may be necessary.

Burns

HX	PE	DDX
Closed space (how long)	Respiratory distress	Airway
Loss of consciousness	Airway burns	Carbon monoxide/toxins
Trauma	(singed hair, soot, erythema, edema)	Cyanide
Accompanying explosion	Lung sounds	Trauma
Toxic exposure, fumes	Burns (% BSA Rule of 9s)	
Respiratory complaints	Trauma	

Treatment:

A. Airway

1. Indications for early intubation include:

a. Signs of respiratory distress, stridor, accessory muscle use.

b. New onset of hoarseness.

c. Blisters or edema of oropharynx.

d. Deep burns to lower face or neck.

B. If MAP < 65 mmHg (systolic BP < 90 mmHg) follow ***Shock*** protocol, otherwise follow initial fluid administration rate as below (if unresponsive to fluid bolus, consider Hydroxocobalamin (Cyanokit®) administration - See item N below).

C. Fluid Administration not in shock (Lactated Ringers, if available).

Age	Initial Fluid Rate
≤ 5 years old	125 mL/hr
6 - 13 years old	250 mL/hr
≥ 14 years old	500 mL/hr

NOTE: Burns greater than 20% TBSA should have two (2) large bore IV/IO

D. Remove jewelry and clothing that is smoldering or non-adherent to the patient.

E. Determine Total Body Surface Area (TBSA) involved utilizing either the rule of nines or palm method. **(Do not include superficial thickness burns in TBSA)**

F. If the patient has the following, transport to the Burn Center:

1. Partial thickness burns greater than 10% total body surface area (TBSA).

2. Full thickness burns in any age group.

3. Electrical burns, including lightning injury.

4. Chemical burns.

5. Inhalation injuries.

6. Burns to face, hands, feet, genitalia, perineum, major joints, or circumferential burns.
7. Burns in high-risk patients (pediatrics, elderly, significant underlying cardiac or respiratory problems).
8. Trauma system patients with burns meeting the above criteria should be transported to Emanuel Trauma Center, if possible.

G. Cool burned areas (no more than 5 minutes) then cover with clean, warm, and dry sheet or blanket or clean saran wrap (if available; do not completely wrap extremity or body). Discontinue cooling if patient begins to shiver. Attempt to leave unbroken blisters intact.

H. Wound care
1. Transport using clean, dry sheets or blankets, or saran wrap.

I. Prevent hypothermia

J. Treat pain per ***Pain Management*** protocol.

K. Apply carbon monoxide (e.g. Rad-57) monitor if available and measure carbon monoxide level. If symptoms are present (e.g. headache, dizziness, weakness, nausea) and carbon monoxide level (COHb) is greater than 15%, administer 100% oxygen.

L. If chemical burn:
1. Consider HazMat response.
2. Protect yourself from contamination. (See ***Hazardous Materials - 50.060*** protocol)
3. Flush contaminated areas with copious amounts of water.
4. If chemical is dry, carefully brush off prior to flushing.
5. Do not use a neutralizer.

M. If electrical burn:
1. Apply sterile dressings to entry and exit wounds. As with other injuries, keep clean, warm, and dry.
2. Treat any dysrhythmias per appropriate ***Cardiac Dysrhythmia*** protocol.
3. Specify arc flash or contact and voltage if known.

N. If cyanide toxicity is suspected based on findings (soot in mouth, nose, or oropharynx) and patient is comatose, in cardiac or respiratory arrest, or has persistent hypotension despite fluid resuscitation:
1. Administer Hydroxocobalamin (Cyanokit®) 5 g IV/IO as an infusion over 15 minutes and monitor for clinical response. Contact OLMC for advice regarding a second dose.
2. If Hydroxocobalamin (Cyanokit®) is not available, then administer Sodium Thiosulfate 50 ml of 25% solution over 10-20 minutes.
3. Hydroxocobalamin (Cyanokit®) and Sodium Thiosulfate may be administered to the same patient but **NOT** at the same time.
4. Treat other presenting symptoms per appropriate protocol.
5. Initiate emergent transport to appropriate facility.
6. Notify receiving facility if either Hydroxocobalamin or Sodium Thiosulfate are administered.

Pediatric Patients:

1. Treat pain per ***Pain Management*** protocol.
2. Consider possibility of non-accidental cause in children.
3. Hydroxocobalamin dose for pediatric patients is 70 mg/**kg** IV/IO over 15 minutes. Do not exceed adult dosing. Follow MCEMS Pediatric Guide Page 22.
4. If MAP or systolic BP is inappropriate for age, treat per ***Shock*** protocol. Follow Pediatric Guide.

Notes and Precautions:

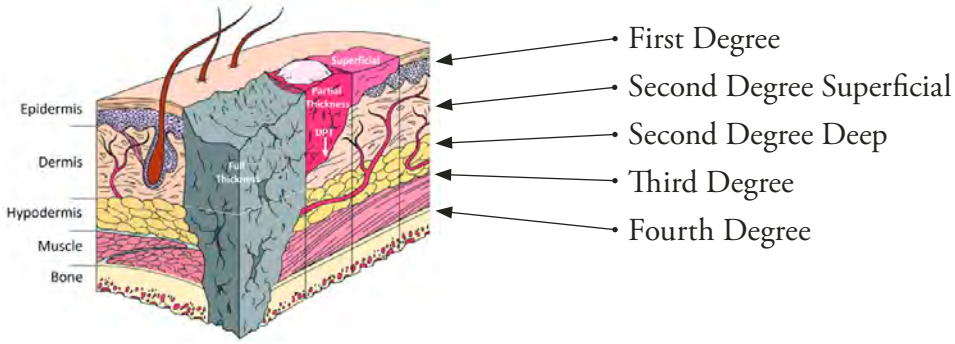
A. Remove rings or other constricting items immediately.

B. Airway
   1. Mild inhalation injuries in patients with normal oxygen saturations and no signs of respiratory distress can be safely observed.
   2. Signs such as singed nasal hairs and facial burns alone are not indications for intubation.
   3. Be prepared to use RSI early to control airway if necessary.

C. Consider the potential for other traumatic injury or MI.

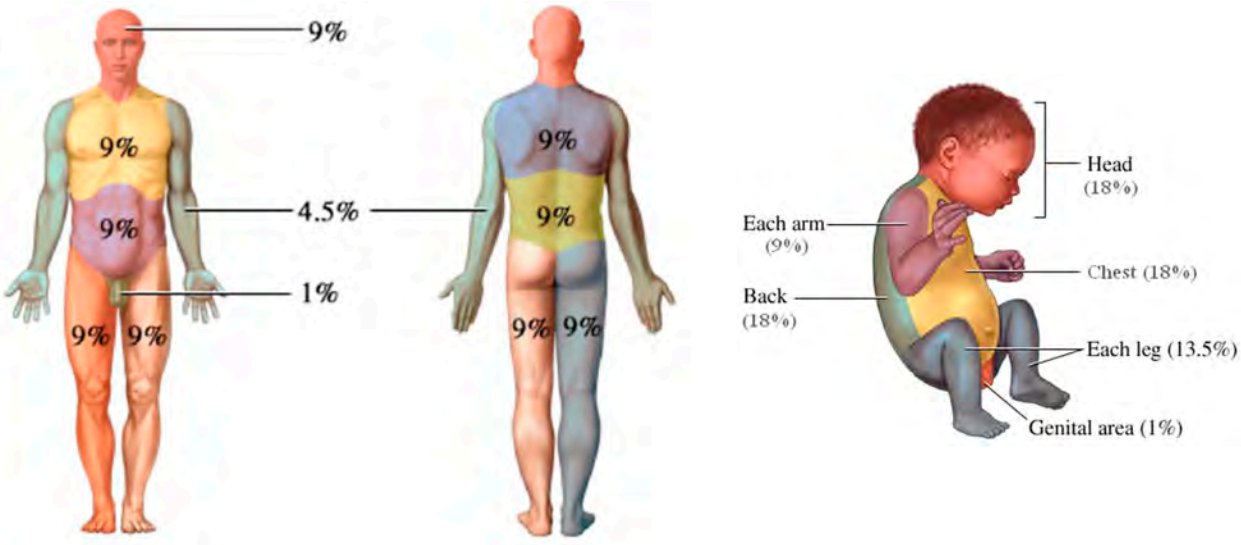
D. Maintaining the patient's core body temperature is a priority. EMS transport vehicles should be warmed and the patient should be covered to prevent hypothermia.

Burn Classifications



Classification	Depth	Anatomical Layer	Appearance
First Degree	Superficial	Epidermis only	Dry, red, painful, blanches
Second Degree Superficial	Partial superficial	Epidermis /papillary dermis	Blisters, moist, erythematous, weeping, blanches, severe pain to touch
Second Degree Deep	Partial Deep	Epidermis /reticular dermis	Blisters, wet or waxy, decreased pain present to deep pressure
Third Degree	Full	Epidermis, all dermal layers	Waxy, white to leathery, absent pain sensation, does not blanch
Fourth Degree	Involves fascia/ muscle and bone	Hypodermis/fascia Muscle Bone	Waxy, white to leathery, absent pain sensation, does not blanch

Rule of Nines:



Palm Method:

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

Cardiac Arrest

Do not delay management to obtain history

HX	PE	DDX
Preceding symptoms Witnessed arrest (yes or no) Down time Presence or absence of bystander CPR Medications/allergies History of cardiac disease or hypertension Evidence of drug ingestion Presence of Advance Directive or DNAR orders	Determine pulselessness and/or apnea Pupil size and reaction Lung sounds (document each time the patient is moved) If present, document: o Dependent lividity o Decomposition o Rigor mortis	Rhythm Asystole VF PEA Etiologies Primary Cardiac Hypovolemia Hypoxia Acidosis Hypoglycemia Hypothermia Toxins Tamponade Tension pneumothorax Thrombosis Trauma

See ***Death in the Field, Advance Directives*** and ***Do Not Attempt Resuscitation Orders*** protocols and follow if appropriate.

Treatment:

A. Initiate CPR (rate 100-120 compressions per minute). Interruptions in CPR should be minimal. When necessary, any interruption should be ideally < 5 seconds.

B. Check cardiac rhythm and follow appropriate ***Cardiac Arrest Algorithm***.

C. Defibrillate if VF or Pulseless VT.

D. Airway should be addressed with MINIMAL INTERRUPTIONS TO CPR. Ventilation rate should be administered as 30:2 (30 compressions to 2 breaths) for adult patients.

E. Use anterior-posterior placement for initial pads (i.e. first set). When available, the second set of defibrillation pads should be placed anterior-lateral.

F. Establish IV or IO access (proximal humerus strongly preferred).

G. Administer epinephrine as soon as feasible for non-shockable rhythms.

H. If 3 or more consecutive shocks have been performed, initiate ***Double Sequential External Defibrillation*** protocol.

I. Initiate ***Induced Hypothermia*** protocol.

J. For patients with suspected hyperkalemia:

- **a.** Administer 3 vials of 10% calcium gluconate to patients with suspected hyperkalemia (high potassium) who are in cardiac arrest. May repeat x2 in 5 min increments.

b. Administer 1 vial of calcium gluconate in patients with suspected hyperkalemia with a pulse. May repeat x2 in 5 min increments.

K. Use of sodium bicarbonate in cardiac arrest:

a. Sodium bicarbonate should be used early in cardiac arrest of sodium channel blocker overdose (e.g. tricyclic antidepressants, diphenhydramine, antiarrhythmics, beta blockers, some anti-epileptics).

b. Sodium bicarbonate is not recommended for routine cardiac arrest sequence but may be considered in a dose of 1 mEq/~~kg~~ after prolonged arrest. Half of the original dose may be repeated every 10 minutes, if it is used.

L. If patient is intubated, consider insertion of OG tube to alleviate gastric distention.

M. Regardless of cardiac arrest etiology or if ROSC is achieved, if patient is transported, transport to closest hospital with interventional cath lab capability.

N. OLMC must be contacted prior to discontinuing resuscitation efforts if patient has an organized rhythm and if $EtCO_2$ is > 10 mmHg with waveform without CPR.

Cardiac Arrest Algorithm

Emergency Medical Responder/EMT:

Flow of the algorithm presumes that the initial rhythm is continuing. If the rhythm changes, begin the appropriate care.

ALS backup must be requested, if not responding, for all cardiac arrests. If for any reason this protocol cannot be followed OLMC should be contacted.

ABCs

1. Press "analyze" and defibrillate, if recommended
2. CPR for 2 minutes
3. Check pulse
4. If no pulse, repeat sequence

NOTES:
Follow manufacturer recommendations for appropriate age and/or weight restrictions for AED/SAD.

Cardiac Arrest Algorithm

Paramedic/EMT-Intermediate:

Flow of algorithm presumes that the initial rhythm is continuing. If the rhythm changes, begin the appropriate algorithm. When necessary, any interruption should be ideally < 5 seconds.

Perform CPR until ready to defibrillate. Charge defibrillator prior to analyzing rhythm. Resume CPR IMMEDIATELY following defibrillation. Check rhythm after 2 minutes of CPR.

Ventricular Fibrillation and Pulseless Ventricular Tachycardia

Initiate CPR
Set up LUCAS, if available
Early defibrillation as below (if indicated)

↓

Shock #1

Check monitor for rhythm - if VF or VT (pulseless)
Defibrillate x 1 at 360 joules
Establish IV or IO access (proximal humerus preferred).
Do not stop CPR
Consider establishing advanced airway (if not witnessed VF)
Infuse 1 L chilled fluid (LR preferred)

↓

Shock #2

If VF/VT persists continue CPR
Defibrillate x 1 at 360 joules
1:10,000 Epinephrine 1 mg IV/IO **-AND- Amiodarone 300 mg** IV/IO
(after 2nd shock)
Consider establishing advanced airway (if not already established)

↓

Shock #3

If VF/VT persists continue CPR
Defibrillate x 1 at 360 joules
Amiodarone 150 mg IV/IO (after 3rd shock)

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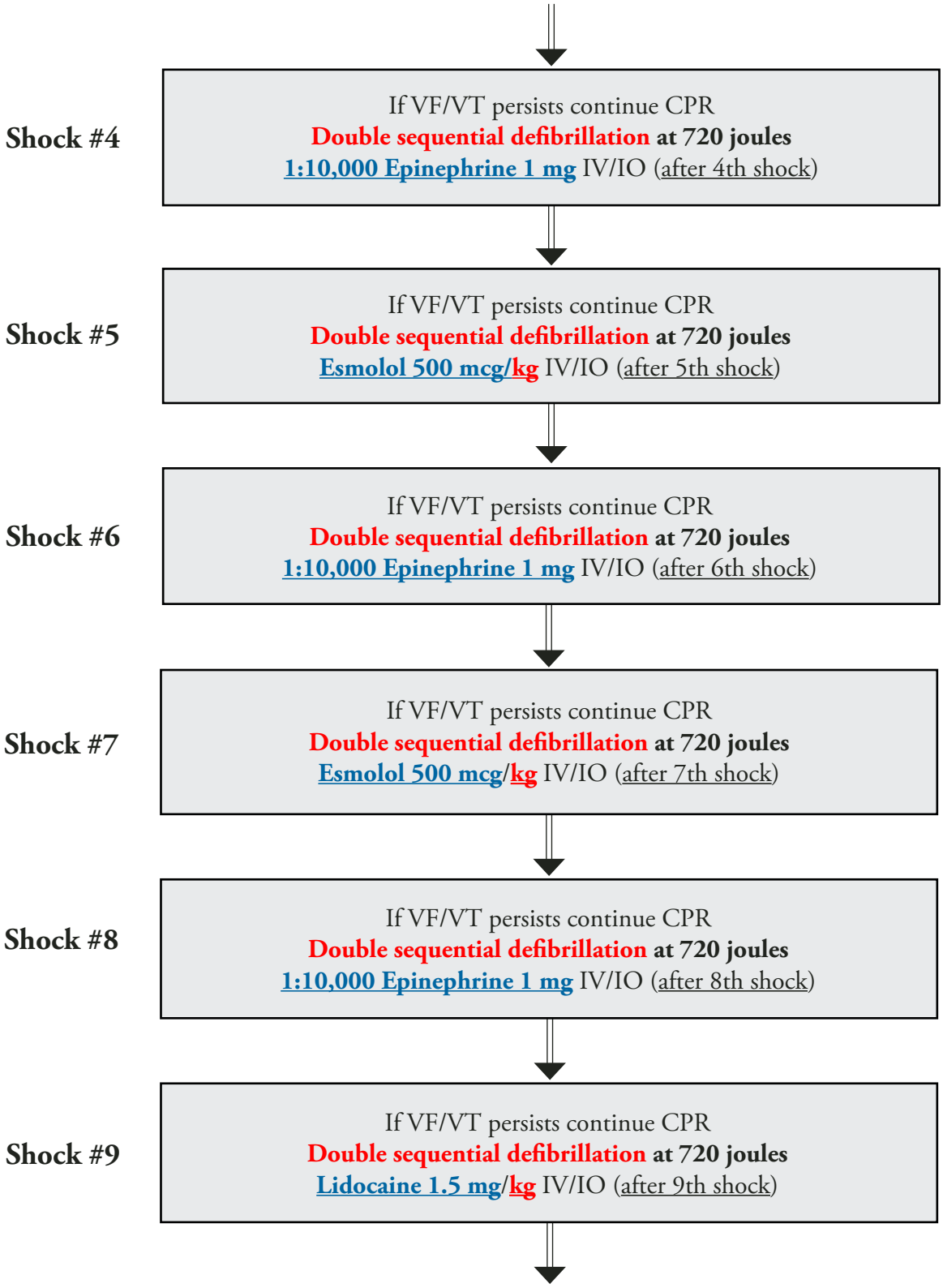
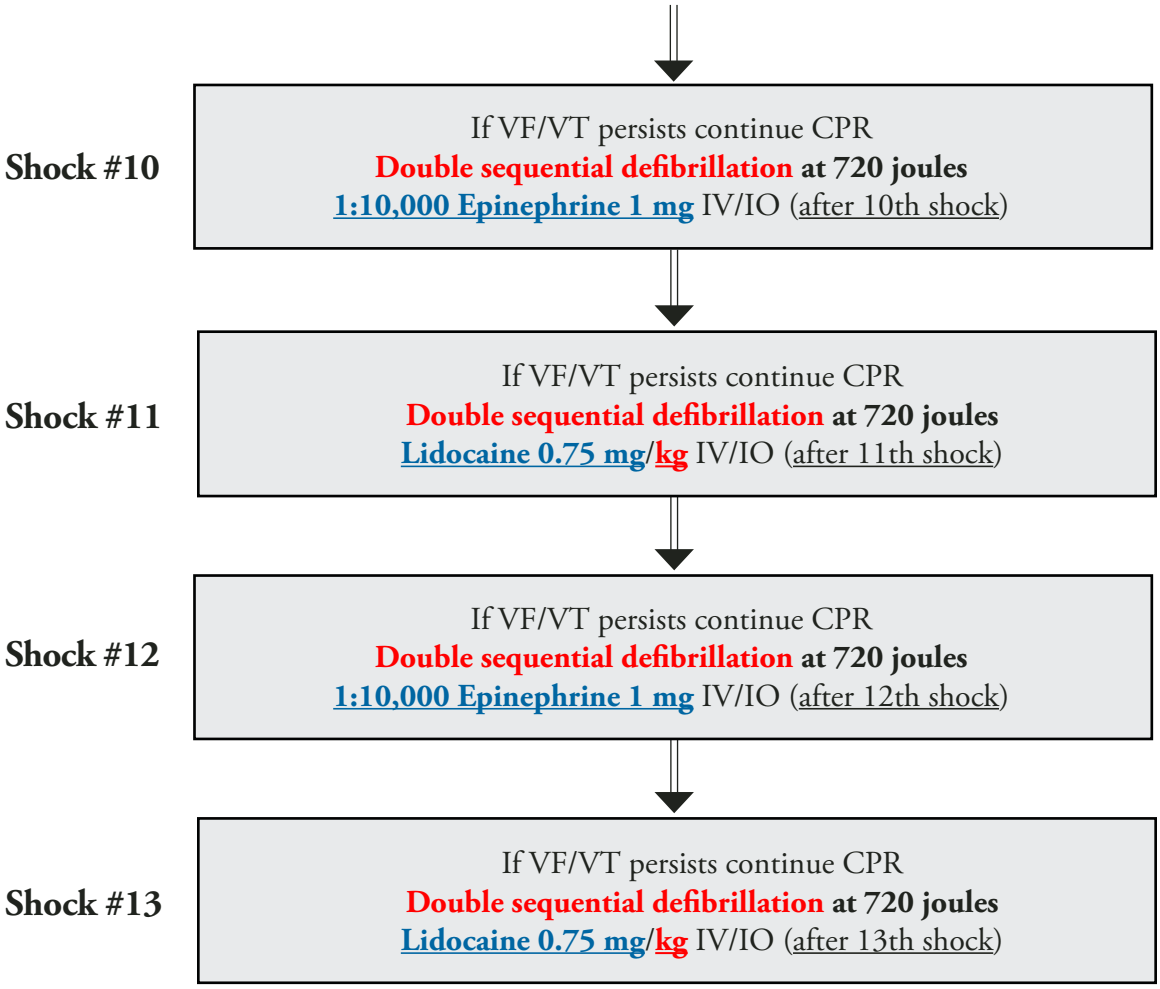

Shock #4
If VF/VT persists continue CPR
Double sequential defibrillation at 720 joules
1:10,000 Epinephrine 1 mg IV/IO (after 4th shock)
Shock #5
If VF/VT persists continue CPR
Double sequential defibrillation at 720 joules
Esmolol 500 mcg/kg IV/IO (after 5th shock)
Shock #6
If VF/VT persists continue CPR
Double sequential defibrillation at 720 joules
1:10,000 Epinephrine 1 mg IV/IO (after 6th shock)
Shock #7
If VF/VT persists continue CPR
Double sequential defibrillation at 720 joules
Esmolol 500 mcg/kg IV/IO (after 7th shock)
Shock #8
If VF/VT persists continue CPR
Double sequential defibrillation at 720 joules
1:10,000 Epinephrine 1 mg IV/IO (after 8th shock)
Shock #9
If VF/VT persists continue CPR
Double sequential defibrillation at 720 joules
Lidocaine 1.5 mg/kg IV/IO (after 9th shock)



NOTES:

A. Initial pad location should be anterior-posterior if feasible. Second pad location should be anterior-lateral.

B. If the rhythm is Torsades, administer magnesium sulfate 2 grams IV/IO as primary antiarrhythmic.

C. Second defibrillator should be attached to the patient as early as practical in anticipation of using double sequential after third single defibrillation.

D. Double sequential defibrillation is to be used only for patients > 12 years old or > 40 kg (> 58 in).

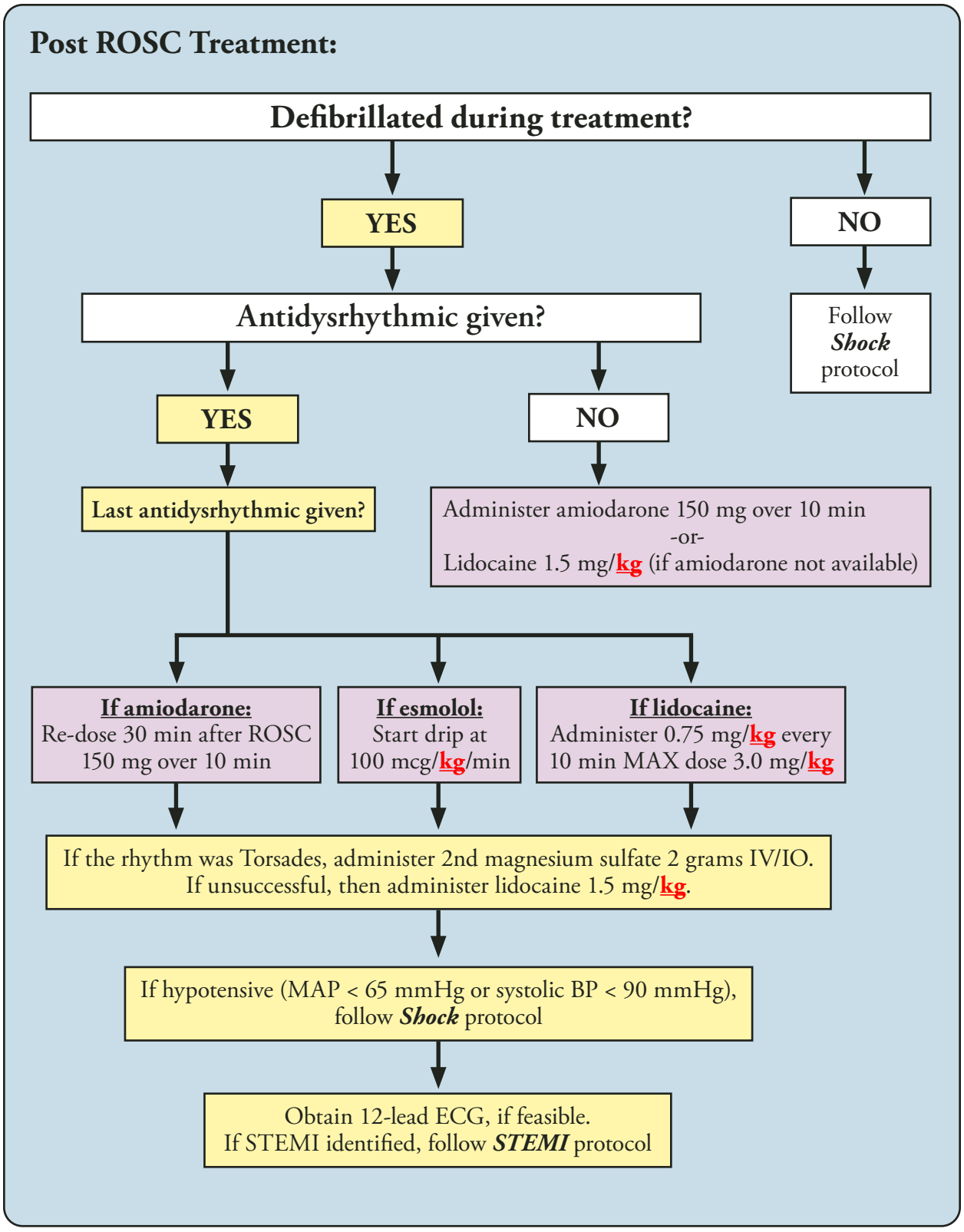
E. Esmolol drip may be substituted as second esmolol bolus (100 mcg/kg/min).

F. After successful resuscitation:

1. **If patient was not defibrillated or cardioverted, do not administer an antidysrhythmic.**
2. If patient was defibrillated or cardioverted with no antidysrhythmic: administer amiodarone 150 mg IV/IO over 10 min. If amiodarone is not available, administer lidocaine bolus (1.5 mg/kg) and re-bolus with 0.75 mg/kg every 10 minutes x2 if needed (cumulative MAX dose 3 mg/kg).
3. If amiodarone was the last antidysrhythmic given: Re-dose 30 minutes after ROSC with amiodarone 150 mg over 10 minutes.
4. If esmolol was the last antidysrhythmic given: start esmolol drip at 100 mcg/kg/min.
5. For Torsades, if first bolus of magnesium was effective, administer 2nd magnesium 2 grams bolus. If unsuccessful, administer lidocaine 1.5 mg/kg and re-bolus with 0.75 mg/kg every 10 minutes x2 if needed (cumulative MAX dose 3 mg/kg).

G. If ROSC is achieved, obtain a 12-lead ECG if feasible. If STEMI identified, follow STEMI protocol.

Post ROSC Treatment:



Cardiac Arrest Algorithm

Paramedic/EMT-Intermediate:

Asystole

(Confirm in two leads, increase gain to rule out fine VF; if rhythm is unclear and possibly Ventricular Fibrillation, defibrillate as for VF)

ABCs

Initiate CPR
Establish IV or IO access (proximal humerus preferred)
1:10,000 Epinephrine 1 mg IV/IO ASAP every 3 to 5 minutes
Consider establishing advanced airway.

↓

Infuse 1 L chilled fluid (LR preferred)

NOTES:

Consider and treat other possible causes:

- Acidosis — consider sodium bicarbonate 1 mEq/kg IV/IO
- Cardiac Tamponade - immediate transport
- Cyclic antidepressants - consider sodium bicarbonate 1 mEq/kg IV/IO
- Hyperkalemia- consider calcium gluconate 3 grams
- Hypothermia- see ***Hypothermia*** protocol
- Hypovolemia- fluid challenge
- Hypoxia- oxygenate and ventilate
- Pulmonary Embolism - immediate transport
- Tension Pneumothorax - needle decompression.

If unresponsive to **at least** epinephrine 3 mg consider termination of efforts if asystole is confirmed in all six limb leads (with full gain).

Administration of lidocaine or amiodarone is not indicated unless VF/PVT was present during resuscitation.

Pulseless Electrical Activity (PEA)

1. Electromechanical dissociation
2. Idioventricular rhythm
3. Ventricular escape rhythm
4. Pulseless bradycardic rhythm
5. Post defibrillation idioventricular rhythm

ABCs

Initiate CPR
Establish IV or IO access (proximal humerus preferred)
1:10,000 Epinephrine 1 mg IV/IO ASAP every 3 to 5 minutes
Consider establishing advanced airway

↓

Infuse 1 L chilled fluid (LR preferred)

NOTES:

If $EtCO_2 \geq 20$, with organized rhythm, initiate fluids per ***Shock*** protocol and consider norepinephrine (4-12 micrograms/min). Continue CPR until palpable pulse.

Consider and treat other possible causes:

Acidosis — consider sodium bicarbonate 1 mEq/kg IV/IO
Cardiac Tamponade - immediate transport
Cyclic antidepressants - consider sodium bicarbonate 1 mEq/kg IV/IO
Hyperkalemia- consider calcium gluconate 3 grams
Hypothermia- see ***Hypothermia*** protocol
Hypovolemia- fluid challenge
Hypoxia- oxygenate and ventilate
Pulmonary Embolism - immediate transport
Tension Pneumothorax - needle decompression.

Administration of lidocaine or amiodarone is not indicated unless VF/PVT was present during resuscitation.

Cardiac Arrest with Pregnancy (> 22 weeks)

Treatment:

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

↓

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

Ensure BVM ventilations are with high flow oxygen utilizing a two-handed technique to prevent gastric inflation. Suction should be readily available.

↓

Early transport is preferable regardless of ROSC status. The gravid uterus must remain displaced during transport. Continue the two-handed technique for uterine displacement (except in the presence of mechanical CPR when the patient can be attached to a board and the board is lifted 30 degrees in left lateral decubitus position). If patient is in cardiac arrest notify and transport to the closest facility.

↓

IV/IO access should be above the diaphragm (humeral IO or external jugular access is preferred).

↓

Intubation should be with an endotracheal tube if possible and be performed by the most experienced provider using VL if available. Consider using an endotracheal tube 1-2 sizes smaller than you would normally use.

Notes and Precautions (Pregnancy):

A. Early transport prior to achieving ROSC, especially if a mechanical CPR device is available.

B. Alert the receiving facility early in order to have an OB team present upon arrival in the emergency department. If you have not achieved ROSC go to the closest facility regardless of OB capabilities.

C. If ROSC has been achieved prior to, or during transport, bypass to an OB and NICU capable facility

D. Lidocaine is preferable (Class B in Pregnancy) to amiodarone (Class C in Pregnancy) in the setting of ventricular fibrillation or pulseless ventricular tachycardia.

E. In the setting of ventricular fibrillation or pulseless ventricular tachycardia, no adjustments need to be made to defibrillation energy settings. Immediately following defibrillation, resume the left lateral uterine displacement.

F. If mechanical CPR is in place, continue the left lateral uterine displacement by tilting the backboard 30° to the left or by continuing manual displacement.

G. If ROSC is achieved continue left lateral uterine displacement by placing the patient in the left lateral decubitus position or by manually displacing the gravid uterus.

H. High flow oxygen needs to be maintained in all peri-arrest patients.

I. Consider OG placement when possible.

Cardiac Arrest Algorithm

Paramedic/EMT-Intermediate:

Pediatric Considerations

Cardiac arrest in children is often secondary to respiratory failure. Ventilation may cause spontaneous return of cardiac function! CPR should be performed at a ratio of 15:2 (15 compressions to 2 breaths). Distal femur IO site is preferred for children <6 years old.

Ventricular Fibrillation and Pulseless Ventricular Tachycardia

Follow adult cardiac arrest algorithm except as noted.
Defibrillate at 4 joules/**kg**.
Substitute the following drug dosages.

1. Epinephrine 0.01 mg/**kg** IV/IO; MAX 1 mg (10 mL 1:10,000 IV/IO)
2. Amiodarone 5 mg/**kg** IV/IO repeat once with 2.5 mg/**kg**
3. Lidocaine 1.5 mg/**kg** IV/IO up to 3 mg/**kg**
4. Sodium bicarbonate 1 mEq/**kg** IV/IO then 0.5 mEq/**kg** for subsequent doses.
5. Magnesium sulfate 25 mg/**kg** IV/IO

Asystole

1. Epinephrine every 3-5 minutes

Pulseless Electrical Activity

1. Epinephrine every 3-5 minutes

Consider and treat other possible causes:
Acidosis — consider sodium bicarbonate 1 mEq/**kg** IV/IO
Cardiac Tamponade - immediate transport
Cyclic antidepressants - consider sodium bicarbonate 1 mEq/**kg** IV/IO
Hyperkalemia- consider sodium bicarbonate 1 mEq/**kg** IV/IO or calcium gluconate 0.5 mL/**kg** IV/IO
Hypothermia - see ***Hypothermia*** protocol
Hypovolemia - fluid challenge
Hypoxia - oxygenate and ventilate
Pulmonary Embolism - immediate transport
Tension Pneumothorax - needle decompression

Quick Reference to Pediatric Drugs - Resuscitation

Table 1: Neonates - Immediate Postnatal Resuscitation

Drug	Indication	Dose
Dextrose, 10% Dilution ratio: 1 part D50 to 4 parts NS.		5 mL/kg (0.5 gram/kg) MAX 250 mL
Epinephrine	Bradycardia, Cardiac Arrest	0.01 mg/kg Repeat every 3-5 minutes
Sodium Bicarbonate (Dilute by 1/2 with NS)	Metabolic Acidosis	1 mEq/kg

Table 2: Infants And Children

Drug	Indication	Dose
Adenosine	PSVT	0.1 mg/kg; 0.2 mg/kg
Amiodarone	V-fib/Pulseless V-tach V-tach with pulse	5 mg/kg IV/IO Repeat once with 2.5 mg/kg 2.5 mg/kg IV/IO Mix with 2 mL/kg of NS in Buretrol and infuse over 10 minutes. May repeat once.
Atropine	Bradycardia	0.02 mg/kg - May repeat dose once. Minimum dose: 0.1 (Do not exceed adult dose)
Calcium Gluconate	Antidote for calcium channel blocker OD, HF, iatrogenic magnesium intoxication	0.5 mL/kg IV/IO. May repeat twice then contact OLMC.
Dextrose, 10%	Hypoglycemia	5 mL/kg (0.5 gram/kg)
Epinephrine	V-fib, low cardiac output, Cardiac arrest, asystole, PEA	0.01 mg/kg Repeat every 3-5 minutes.
Lidocaine	Recurrent Ventricular Fibrillation, Stable VT	Bolus: 1.5 mg/kg (3 mg/kg MAX) Maintenance: 0.75 mg/kg q 10 min.
Midazolam	Pacing, Cardioversion, Seizures	IV or IO: 0.1 mg/kg IM or IN: 0.3 mg/kg
Magnesium Sulfate	V-fib/Pulseless V-tach	25 mg/kg IV/IO
Naloxone	Respiratory depression secondary to narcotics	0.1 mg/kg - MAX of 2 mg.
Norepinephrine	Low cardiac output	0.1 to 2 micrograms/kg/min
Sodium Bicarbonate (Dilute by 1/2 with NS)	Metabolic acidosis, Cyclic antidepressant OD, Hyperkalemia	1 mEq/kg/dose

Note: Pediatric doses should not exceed adult doses.

Cardiac Dysrhythmias

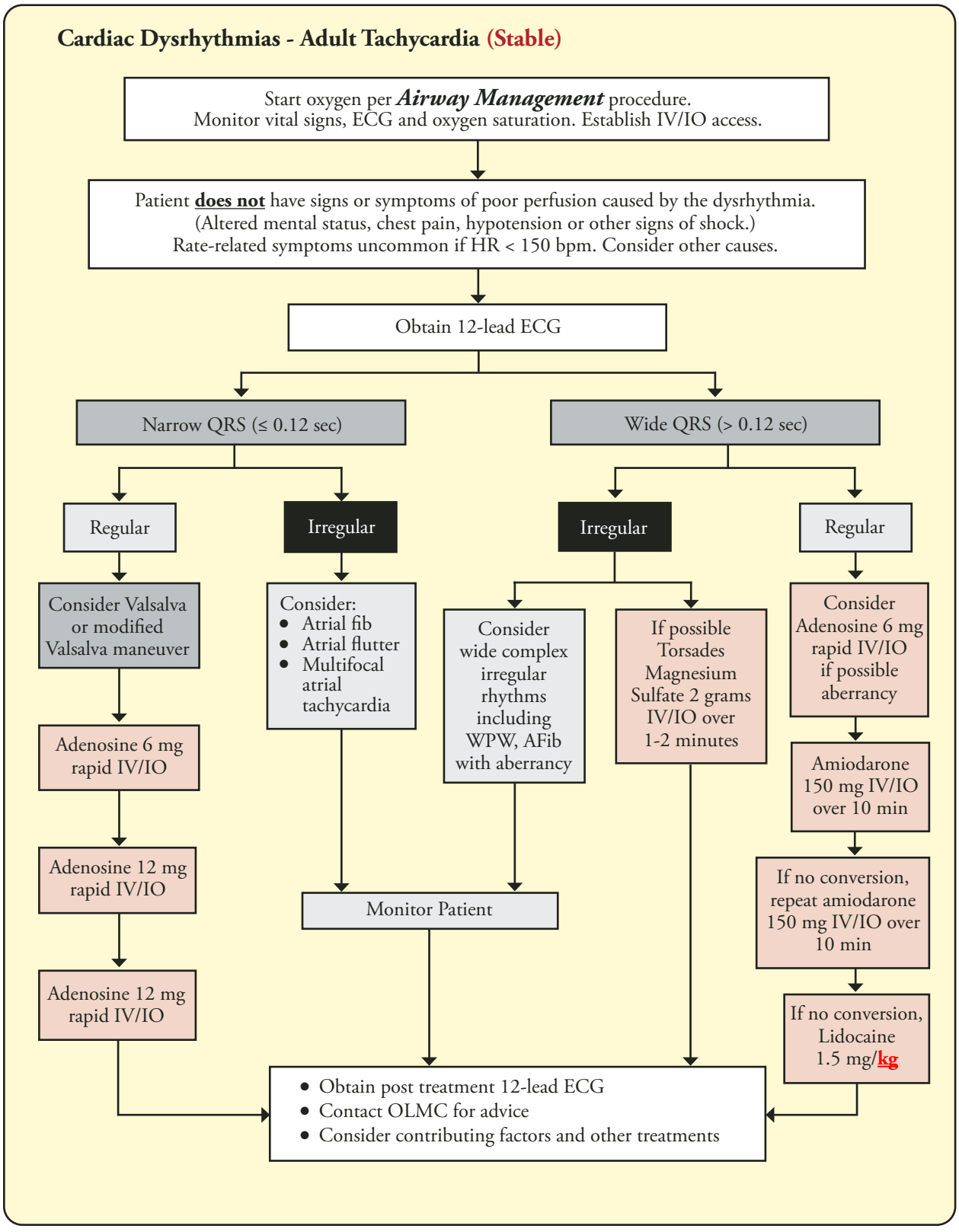
HX	PE	DDX
Past medical history Medications • Beta blockers • Calcium Channel blockers • Clonidine • Digitalis Pacemaker	AMS Respiratory distress Hypotension / shock Chest pain CHF Syncope Seizures	Sinus bradycardia AV blocks Acute MI Hypoxia Hypothermia Head injury (increased ICP) Spinal cord lesion Sick sinus Overdose

Treatment:

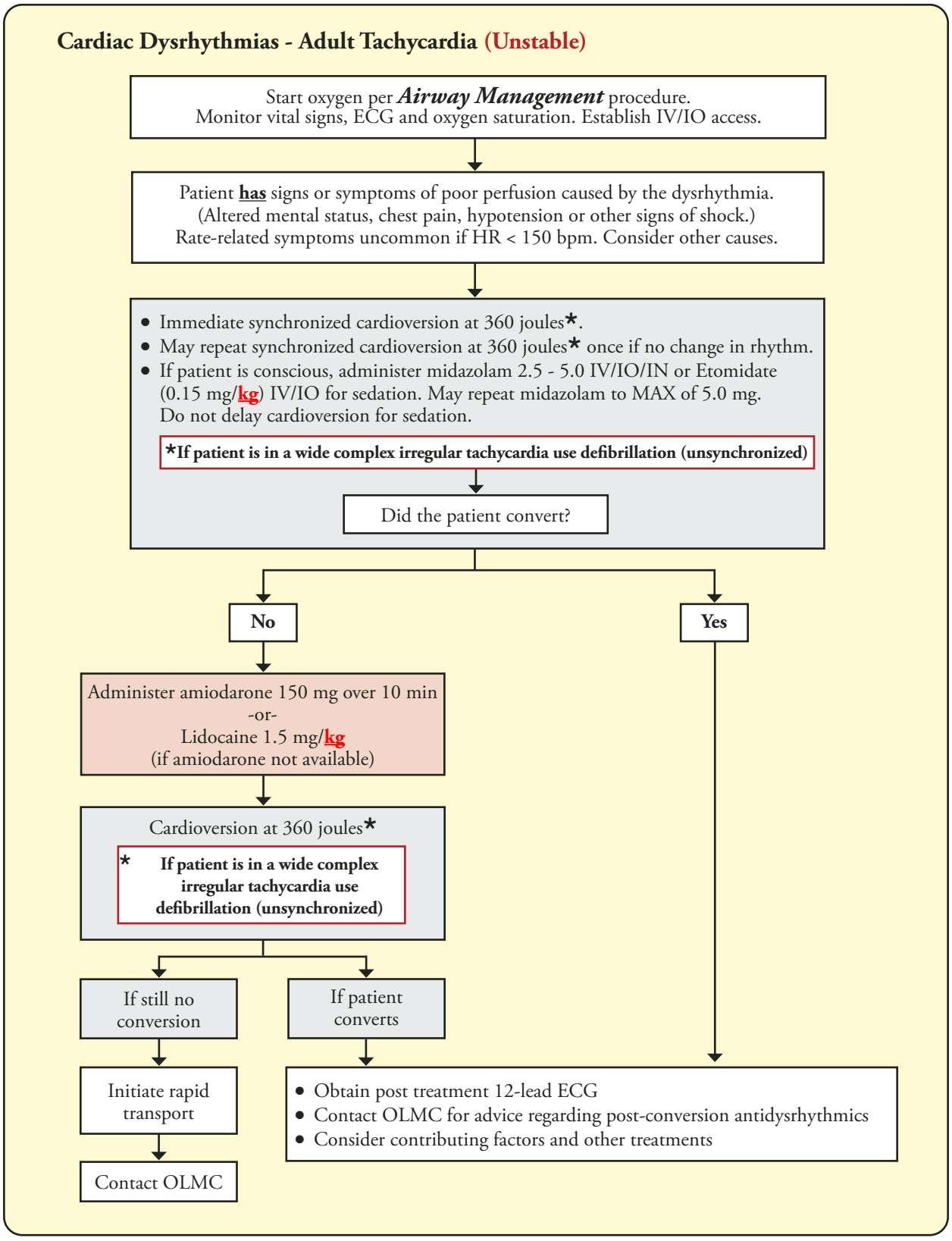
A. Start O_2, follow ***Airway Management*** procedure, and apply pulse oximeter.
B. Start IV/IO, NS and follow ***Shock*** protocol if indicated.
C. Monitor cardiac rhythm, see the following cardiac dysrhythmias on the next pages:

NOTES:
If the patient is asymptomatic, dysrhythmias may not require treatment in the field.

Cardiac Dysrhythmias - Adult Tachycardia (Stable)



Cardiac Dysrhythmias - Adult Tachycardia (Unstable)



Notes and Precautions: (Tachycardia):

A. In stable wide complex tachycardia which is monomorphic, consider adenosine if SVT with aberrancy is suspected.

B. If the patient is asymptomatic, tachycardia may not require treatment in the field. Continue to monitor the patient for changes during transport. The acceptable upper limit for heart rate for sinus tachycardia is 220 minus the patient's age.

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

D. If pulseless arrest develops, follow ***Cardiac Arrest*** protocol.

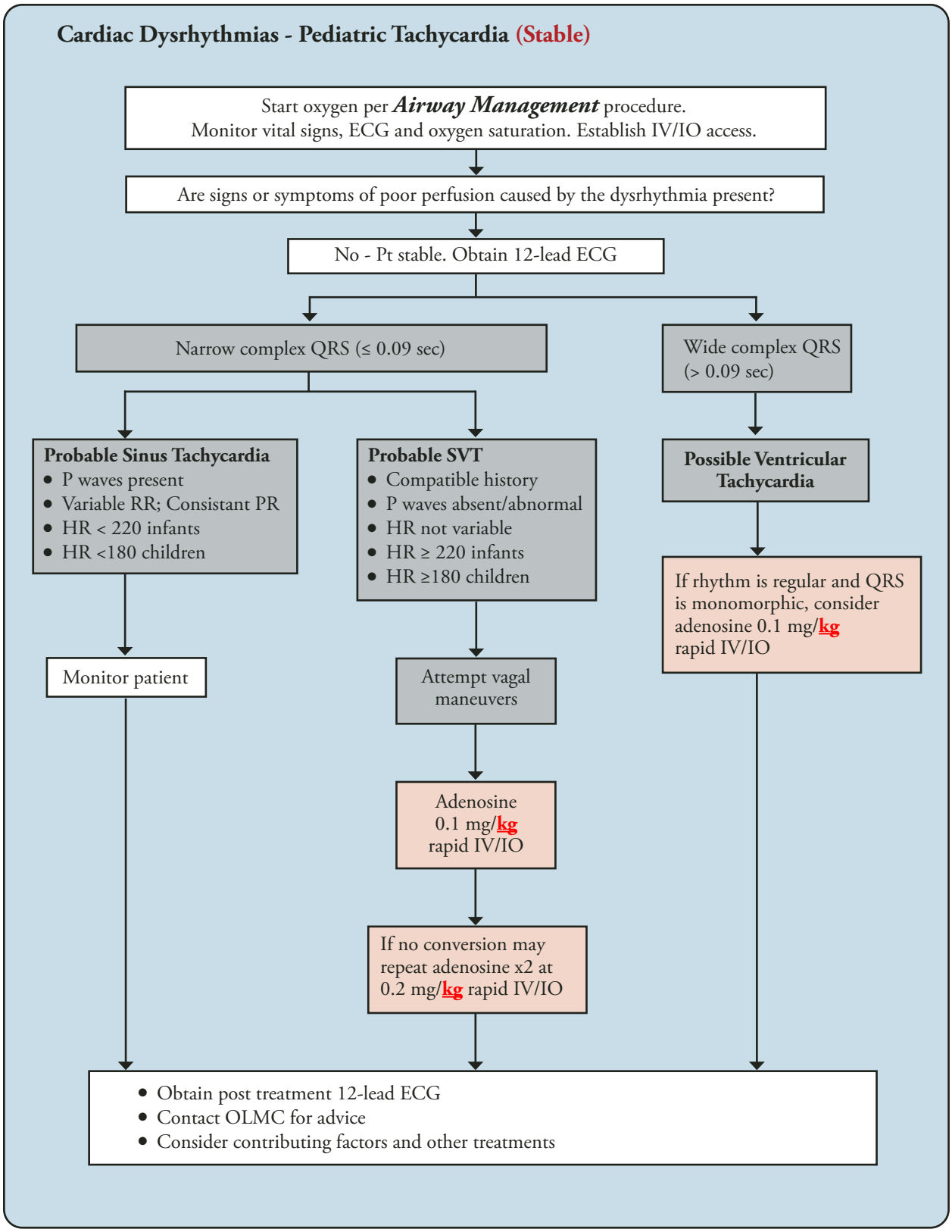
E. All doses of adenosine should be reduced to one-half (50%) in the following clinical settings:
- **1.** History of cardiac transplantation.
- **2.** Patients who are on carbamazepine (Tegretol) and dipyridamole (Persantine, Aggrenox).
- **3.** Administration through any central line (Porta Cath, Broviac, Hickman, etc).

F. Adenosine may initiate atrial fibrillation with rapid ventricular response in patients with Wolff-Parkinson-White syndrome.

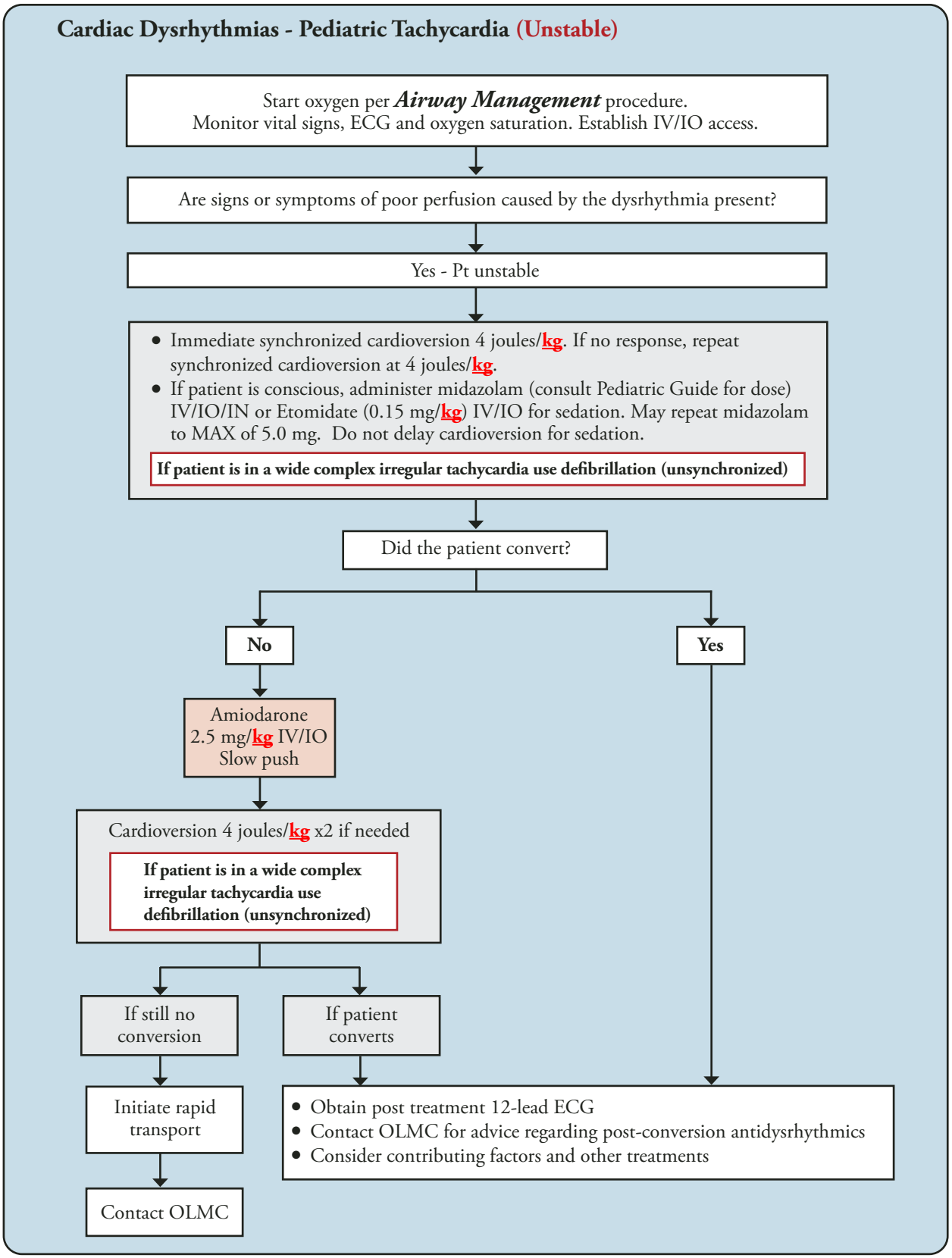
G. Adenosine should be used with caution in patients with asthma as it may cause a reactive airways response in some cases.

H. Modified Valsalva procedure is performed by having the patient sit in an upright position. With the assistance of a 10ml syringe, encourage the patient to strain for a full 15 seconds by forced expiration. After 15 seconds, lay the patient flat and elevate their legs to 90 degrees for 15 seconds. Then lie the patient's legs flat for 60 seconds. May be repeated x1.

Cardiac Dysrhythmias - Pediatric Tachycardia (Stable)



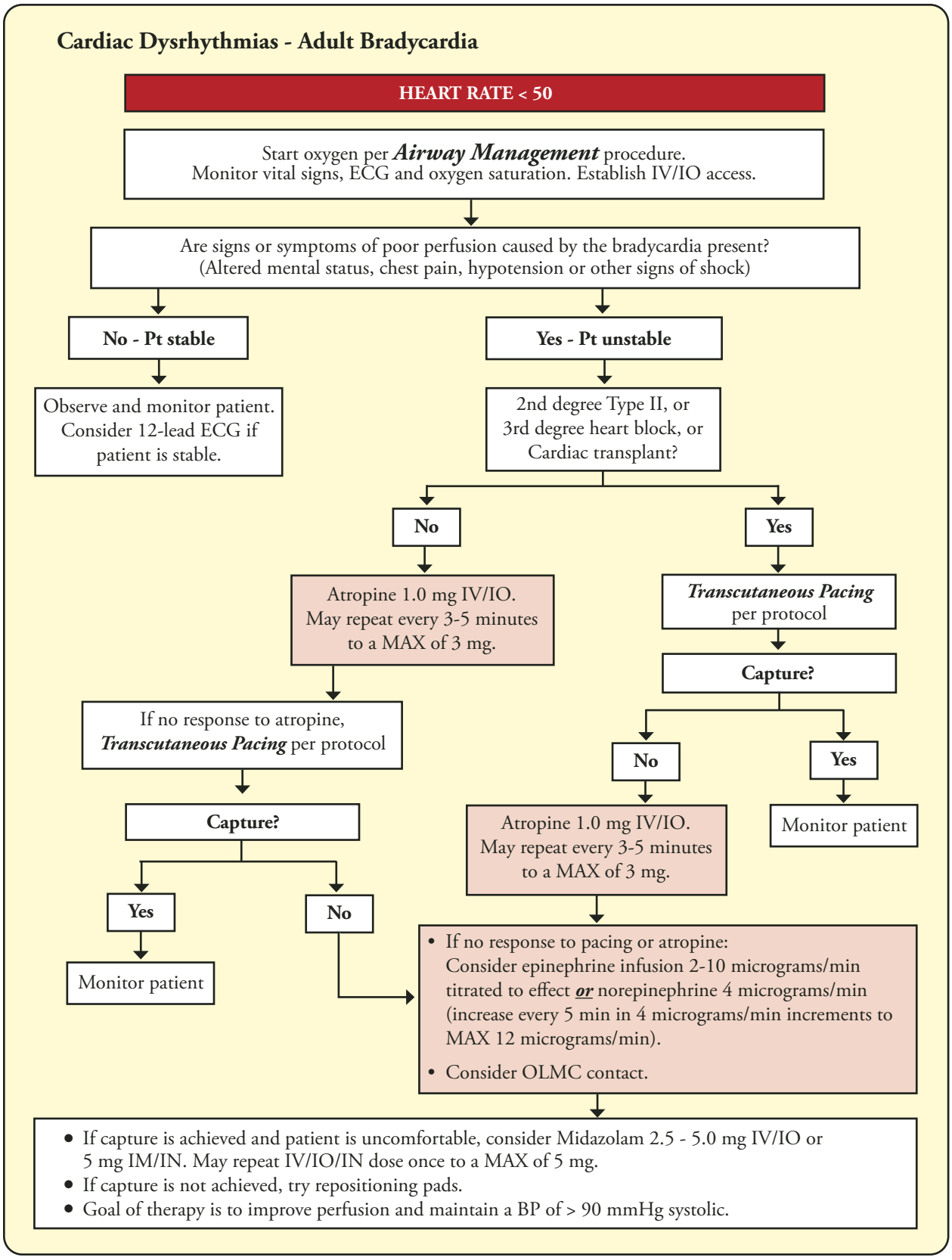
Cardiac Dysrhythmias - Pediatric Tachycardia (Unstable)



NOTES:

A. Use pediatric pads for cardioversion for children less than 15 kg.
B. Place on anterior chest in sternal-apical location.
C. If pediatric pads are not available, use adult pads placed anterior-posterior on the chest wall with firm contact.
D. If available defibrillator will not "dial down" to appropriate energy level, use lowest possible energy level available.

Cardiac Dysrhythmias - Adult Bradycardia



Notes and Precautions: (Bradycardia):

A. Hypoxia is a common cause of bradycardia.

B. Bradycardia may be protective in the setting of cardiac ischemia and should only be treated if associated with serious signs and symptoms of hypoperfusion. Increasing heart rate may worsen ischemia or increase infarct size.

C. Hyperkalemia may cause bradycardia. If the patient has a wide complex bradycardia with a history of renal failure, muscular dystrophy, paraplegia, crush injury or serious burn > 48 hours prior, consider treatment per Hyperkalemia protocol.

D. Immediate ***Transcutaneous Pacing*** can be considered in unstable patients when vascular access is not available.

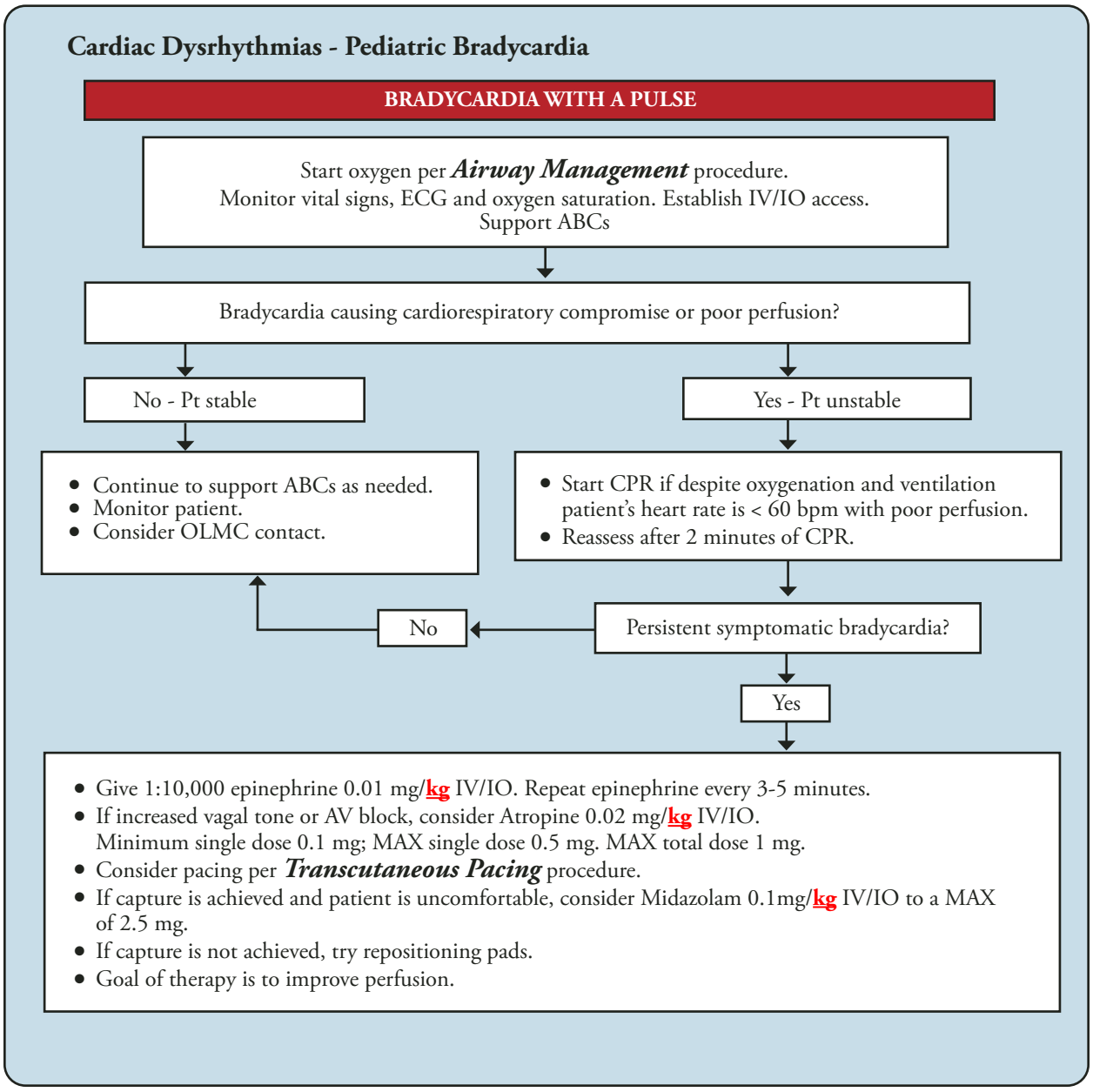
E. ***Transcutaneous Pacing*** is at best a temporizing measure and is not useful in asystole.

F. If ***Transcutaneous Pacing*** capture is not achieved, try repositioning pads.

G. If capture is achieved with ***Transcutaneous Pacing*** and patient is experiencing discomfort administer midazolam 2.5 - 5.0 mg IV/IO or 5 mg IM. May repeat IV/IO dose once to a MAX of 5 mg.

H. Atropine will likely be ineffective in heart transplant recipients because they lack vagal innervation.

I. 3rd degree heart blocks with a wide complex QRS (>0.12 sec) are less likely to respond to atropine than those with a narrow complex.



Specific Precautions:

A. Most pediatric bradycardia is due to hypoxia. Oxygenate and ventilate aggressively.

Premature Ventricular Complexes (PVCs):

A. Treat only in the setting of a suspected ischemic event (i.e. angina chest pain).
B. If PVCs are associated with bradydysrhythmia, see section on bradydysrhythmias.
C. Amiodarone for PVCs (multi-focal, runs of VT, etc.):
  1. Initial bolus of 150 mg over 10 minutes.
  2. Amiodarone should not be used without OLMC direction, if:
    a. BP is less than 90 mm/Hg.
    b. Heart rate is less than 50 beats per minute.
    c. Periods of sinus arrest.
    d. Presence of second or third degree AV block.

Wide Complex Arrhythmia with suspected Hyperkalemia (e.g. renal failure, crush injury, rhabdomyolysis)

A. All the above conditions may elevate blood potassium levels (hyperkalemia) causing bradycardia, hypotension, weakness, weak pulse and shallow respiration
B. Typical ECG changes include peaked T-waves, lowered P-wave amplitude or the loss of the P-wave altogether, prolonged PR interval, second or third degree AV block, and a widened QRS
C. For individuals with a pulse (in order of priority):
  1. Administer 10 mL calcium gluconate 10% solution slow IV/IO over 30-60 seconds. Repeat dose approximately every 5 minutes until QRS ≤ 0.12 ms.
  2. High dose albuterol (10 mg in saline) via nebulizer.
  3. Sodium bicarbonate, one amp (50 mL) IV/IO.
D. For individuals without a pulse:
  1. Administer a minimum of 30 mL calcium gluconate 10% IV push (total of 3 vials).
  2. Sodium bicarbonate, one amp (50 mL) IV/IO.

NOTES:
Do not mix sodium bicarbonate with calcium preparations. Administer calcium gluconate at a site proximal to the IV catheter. Slowly flush remaining calcium gluconate from the catheter prior to administering sodium bicarbonate.

Chest Pain / Acute Coronary Syndrome

HX	PE	DDX
Pain (onset, duration, severity, location, radiation, aggravation) (N/V, SOB, diaphoresis, arm pain) Previous MI, angina, HTN, diabetes, COPD Previous cardiac surgeries, stents Medications	Breath sounds Peripheral edema	Acute MI Unstable angina Pulmonary embolus Pneumothorax Aortic dissection Esophageal rupture

Treatment:

A. Start O_2, follow ***Airway Management*** procedure.

B. Monitor vital signs, cardiac rhythm and oxygen saturation. Attempt to maintain O_2 saturation above 95%.

C. If ischemic event suspected, obtain 12-lead ECG if available. This may be done concurrently with other treatment and should not delay treatment or transport. See below for interpretation.

D. Start IV/IO prior to administration of nitroglycerin for patients who have never taken nitroglycerin; follow ***Shock*** protocol if indicated.

E. Drugs:

1. Administer chewable aspirin PO (approximately 324 mg) unless contraindicated.

2. After 12-lead is obtained, nitroglycerin 0.4 mg SL (spray, tablet or powder) every 5 min, if systolic BP is equal to or greater than 100 mm/Hg, or until chest pain is relieved.

3. For pain unrelieved after 3 nitroglycerin, and if the BP is greater than 100 mm/Hg systolic, administer fentanyl 25-100 micrograms IV/IO/IN; may repeat every 3-5 minutes as needed to a MAX of 400 micrograms. Or, fentanyl 25-100 IM; may repeat every 15 minutes to a MAX of 400 micrograms. Nitroglycerin may be continued for strong suspicion of acute coronary syndrome.

Specific Precautions

A. DO NOT DELAY ADMINISTRATION OF ASPIRIN TO OBTAIN 12 LEAD.

B. NTG administration to patients with an acute inferior wall myocardial infarction should be performed with close monitoring of vital signs and rhythm. NTG in these patients may result in symptomatic hypotension and/or shock which should be treated with usual measures (fluids, changes in position, medications if necessary).

C. Do not administer nitroglycerin without OLMC if patient has taken Viagra® or other similar drugs in the last 24 hours or Cialis® (tadalafil) within last 48 hours.

D. Contraindications to administration of aspirin:

1. Allergy to aspirin or aspirin induced asthma.

2. History of active bleeding disorder, (i.e., hemophilia).

3. Current ulcer or GI bleeding.

4. Suspected aortic dissection.

E. If 12-Lead ECG is obtained, use biological sex as assigned at birth. If patient does not disclose, use default setting (male).

Field Identified ST-Elevation MI (STEMI)

Indication

12-lead ECG with:

- Paramedic interpretation of probable STEMI: 1 mm elevation in 2 contiguous limb leads or 2 mm elevation in 2 contiguous chest leads.

Action

A. As soon as STEMI is recognized, prompt and early notification of the receiving facility of "STEMI patient" or "STEMI alert" should be performed.

B. Apply defibrillation pads on patient (Anterior-Posterior placement, if feasible).

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

D. Non-diagnostic ECGs with potential "imitators" of ACS or ECGs that are clinically concerning should be described to the receiving hospital or OLMC.
These may include:

- LBBB or RBBB
- LVH
- SVT with aberrancy
- Paced rhythms
- Pericarditis
- Benign early repolarization
- Digitalis effect

NOTES:

- New ST-segment elevation at the J point in 2 contiguous leads with the cutoff point as greater than 1 mm in all leads other than V2 or V3.
- In leads V2-V3 the cutoff point is greater than 2 mm in men > 40 years old and greater than 2.5 mm in men < 40 years old, or > 1.5 mm in women.

Field Identified Occlusive Myocardial Infarction (OMI)

Indication

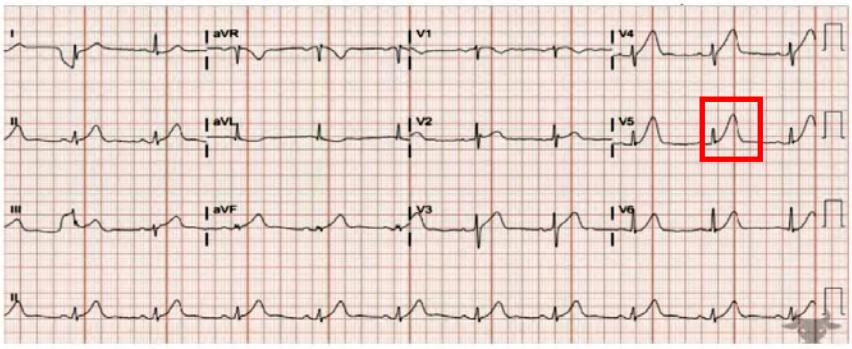
12-lead ECG with:

A. Paramedic interpretation of probable OMI.

1. Hyperacute T waves (Figure 1).

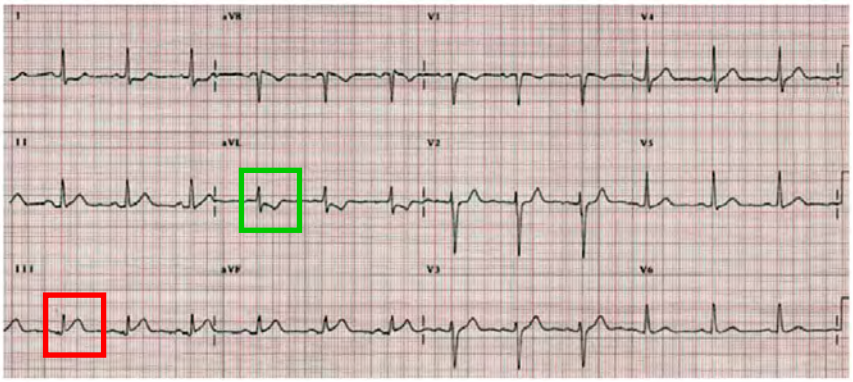
a. Broad asymmetric peaked T waves.

b. T wave relatively larger compared to the QRS complex.



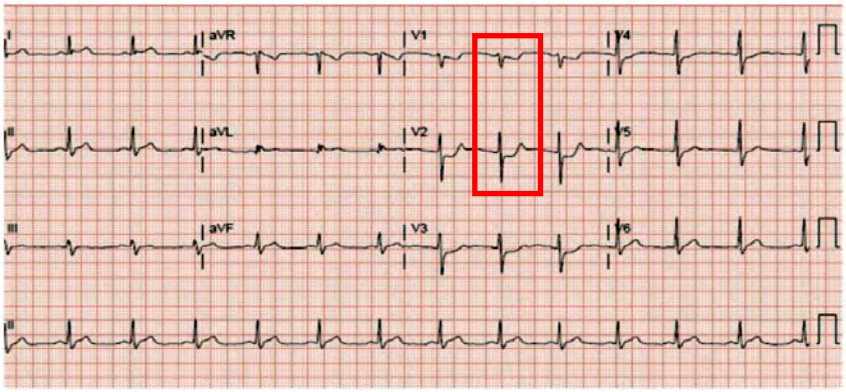
2. Inferior wall MI (Figure 2)

a. Elevation of any degree in two contiguous inferior leads (II, III, aVF) with any amount of ST depression in aVL.



3. Posterior wall MI (Figure 3)

a. ST depression maximal in leads V1-V4, without progression to V5-V6.



4. DeWinter MI (Figure 4)
   - **a.** De Winter T waves are tall, prominent, symmetrical T waves arising from upsloping ST-segment depression >1 mm in the precordial leads.
   - **b.** 0.5 to 1 mm ST segment elevation in aVR.

5. Wellens syndrome (Figure 5)
   - **a.** Biphasic or deeply inverted and symmetric T waves in V2 and V3 (may extend to V6).

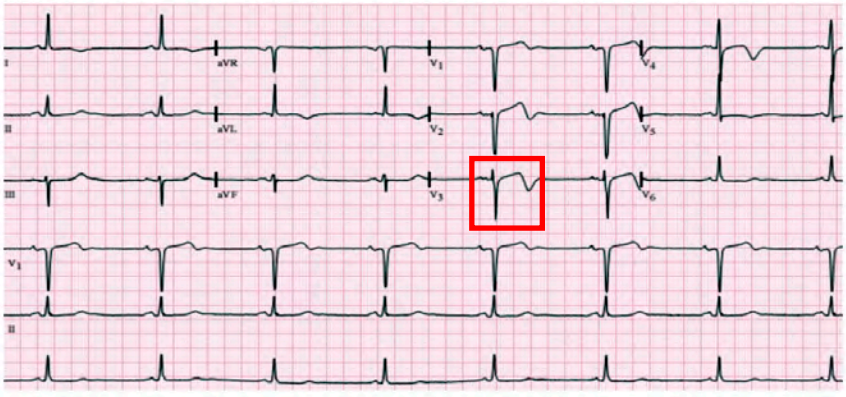


Figure 1

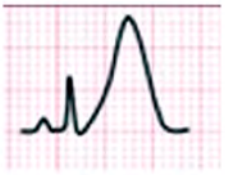


Figure 2

Figure 3

Figure 4

Figure 5

Action

- **A.** As soon as OMI is recognized, transmit the 12-lead ECG, if feasible, to the receiving hospital and transport to destination hospital ED with interventional capability. (Inform ED of emergency Code-3 transport).
- **B.** Apply defibrillation pads on patient (Anterior-Posterior placement, if feasible).

Crush Injury

HX	PE	DDX
Body part entrapped Mechanism of entrapment Length of time entrapped Function of body part (e.g. able to feel, move extremity)	LOC Airway Extremity pulses, neurologic function	Respiratory distress Dehydration Pain Hypo and/or hyperthermia

Treatment:

A. Control/stop hemorrhage.
B. Airway Management procedure if indicated.
C. Spinal immobilization if indicated.
D. Monitor cardiac rhythm for signs of hyperkalemia. (Widening QRS > .08ms, peaked T-waves, sine wave, etc).
E. Start IV/IO if feasible.
F. Consider pain management.
G. Wound care.
  1. Remove all restrictive dressings (clothing, jewelry, etc).
  2. Continually monitor distal pulse, motor and sensation in involved extremity.
  3. Bandage all open wounds. (Irrigate if needed.)
  4. Stabilize all protruding foreign bodies (impaled objects).
  5. Splint/immobilize injured areas.
  6. For suspected pelvic crushing injuries, follow the ***Pelvic Wrap*** procedure if indicated.
H. If severe crushing injury/compartment syndrome:
  1. If cardiac monitor is available, treat for hyperkalemia if present.
  2. If feasible, administer 1000 – 2000 mL (pediatric: 10 to 20 mL/**kg**) of isotonic fluid prior to extrication and maintain IV/IO infusion at 500 mL (peds 5 mL/**kg** per hour).
  3. Perform extrication.
  4. Reassess patient and monitor for signs of hyperkalemia.
I. If hyperkalemia is suspected or present, then:
  1. Administer 10mL calcium gluconate 10% solution slow IV over 30 – 60 seconds.
  2. High dose albuterol (10mg in saline by nebulizer).
  3. Sodium bicarbonate, one amp (50mL) IV/IO.

Precautions:

- If circumstances warrant, begin warming procedures to prevent hypothermia.
- If patient is trapped in a heavy dust environment, consider methods to provide nebulized oxygen. Consider the use of nebulized albuterol.
- If patient is severely trapped and requires prolonged extrication or potential amputation, contact OLMC for Trauma Surgeon advice and ensure that a technical rescue team is activated.
- During extrication, continually monitor patient condition, if possible.

Notes:

- Renal failure may elevate blood potassium levels (hyperkalemia) causing bradycardia, hypotension, weakness, weak pulse and shallow respiration. Typical ECG changes include peaked T-waves, lowered P-wave amplitude or the loss of the P-wave altogether, prolonged PR interval, second degree AV block, and a widened QRS.

Diabetic Emergencies

HX	PE	DDX
Polyuria Polydipsia Fatigue/weakness Thirst Muscle cramps Nausea and vomiting Coma Abdominal pain Confusion Fruity odor breath Blurred vision Headache	LOC CBG Vitals signs Capnography Neuro exam -altered mental status -coma Poor skin turgor Weak rapid pulse Temperature	CVA Drug/toxin Psychiatric and Behavior disorders Sepsis MI/ACS Pneumonia CO poisoning Seizure Head trauma

Clinical presentation:

- **A. Hypoglycemia**
- **B. Hyperglycemia (symptomatic)**
  1. **Suspected diabetic ketoacidosis (DKA)**
  2. **Hyperosmolar nonketotic coma (HNC)**

Hypoglycemia Treatment:

Determine capillary blood glucose level using blood glucose meter. If the blood glucose reading is less than 60 mg% or glucose less than 80 mg% in a known diabetic:

A. Administer glucose:

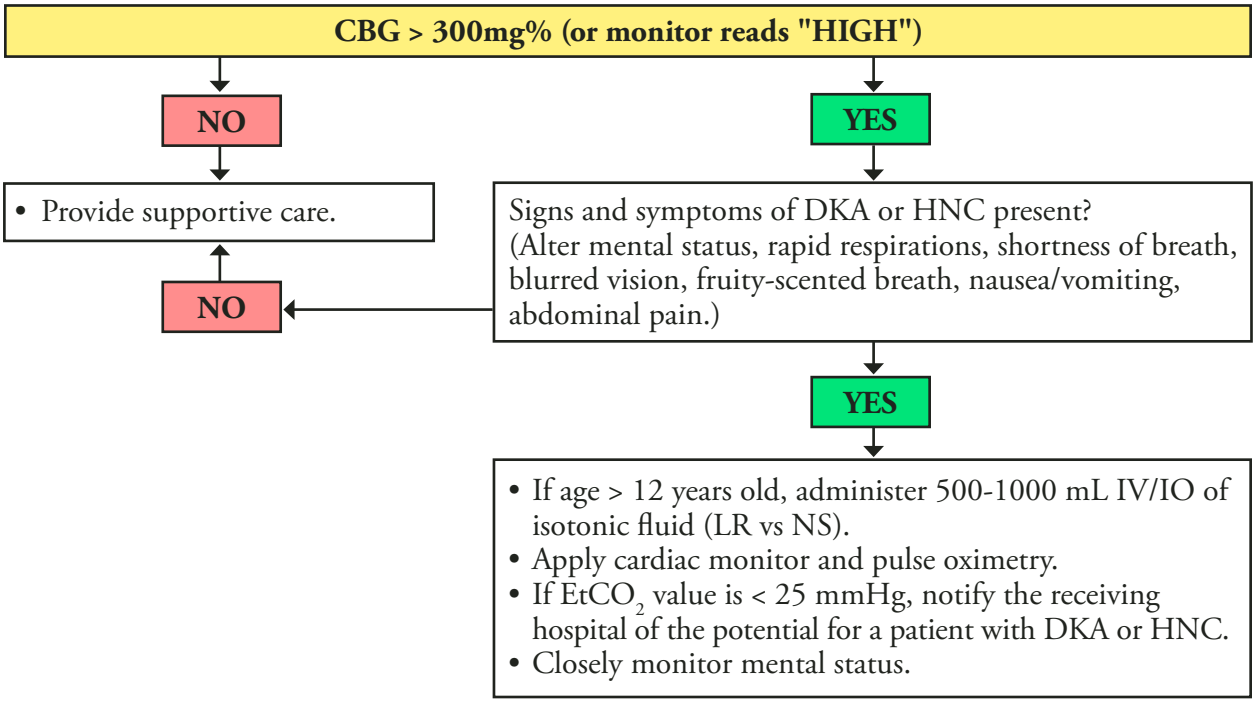
1. Do not administer oral glucose to patients without a gag reflex or with a rapidly diminishing level of consciousness.
2. If patient is unable to take sugar orally, administer dextrose 50%, 25-50 mL (in large vein) or dextrose 10%, 125-250 mL.

B. Repeat capillary blood glucose level after 10 minutes and treat if it remains low.

C. If unable to administer oral glucose or establish IV/IO, give glucagon 1 mg IM.

Hyperglycemia Treatment:

A. Determine capillary blood glucose level.
B. If CBG > 300 mg% (most above 400 mg%) with symptoms or glucometer reads "HIGH":
  1. Establish vascular access.
  2. Place patient on cardiac monitor and pulse oximetry.
  3. Apply and continuously monitor $EtCO_2$.
  4. If age >12 years old, administer 500-1000 mL of Normal Saline or Lactated Ringers during transport if no evidence of pulmonary edema or volume overload.
  5. If $EtCO_2$ value is < 25 mmHg, notify the receiving hospital of the potential for a patient with DKA or HNC.
  6. Closely monitor mental status in patients with suspected DKA or HNC.



Pediatric

1. Follow adult algorithm.
2. If patient is < 40 kgs or 88 lbs or 58 inches, consider administration of 10 mL/**kg** of Normal Saline or Lactated Ringers during transport if no evidence of pulmonary edema or volume overload.

Notes & Precautions:

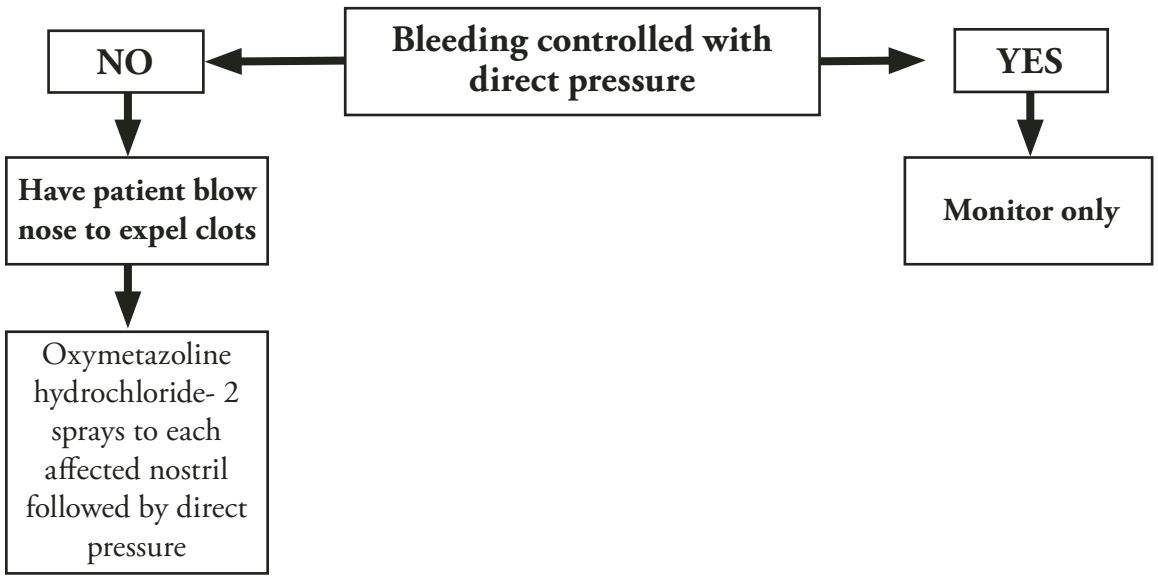
A. If concern for DKA or HNC, avoid intubation unless the patient cannot protect their airway or there is evidence of extreme fatigue with an inability to ventilate or oxygenate.
B. Monitor patient for signs of hyperkalemia.
C. Proceed with caution in patients with history of CHF.
D. If feasible, check temperature; signs of hyperglycemia may be caused from infections.

Epistaxis

HX	PE	DDX
Prior history of epistaxis Severity Frequency Duration Potential causes: • Trauma • Medications (e.g. anticoagulation, currently on chemotherapy) • Underlying diseases such as hematological malignancy (e.g. leukemia, liver disease) • Bleeding disorder (e.g. hemophilia, Von Willebrand Disease)	Estimate blood loss Bilateral bleeding Blood in posterior pharynx Vital signs Signs of severe liver disease (ascites, icterus)	Chronic sinusitis Foreign body Trauma Medications Bleeding disorders Hypertensive crisis

Treatment:

A. Place patient in position of comfort and have them tilt head forward.
B. Compress nose with direct pressure or approved nose clip device.
C. If Mean Arterial Pressure (MAP) < 65 mmHg, follow ***Shock Protocol***.



Pediatric

1. Follow adult algorithm.
2. Oxymetazoline hydrochloride should be avoided if child cannot follow instructions to blow their nose or are unable to tolerate the administration of a nasal medication.

Specific Precautions

A. It is difficult to quantify blood loss with epistaxis.

B. Bleeding may also occur posteriorly. A posterior nasal bleed will continue to bleed in spite of direct pressure. In many cases, examining the back of the throat or asking the patient if bleeding "has slowed or stopped" is also helpful.

C. Posterior epistaxis is a true emergency and may require advanced ED techniques such as balloon tamponade or interventional radiology. Do not delay transport. Be prepared for potential airway issues.

D. Detailed medication history should be obtained to include Coumadin and newer anticoagulation agents (direct oral anticoagulants (DOAC's) such as apixaban, rivaroxaban, dabigatran), aspirin, NSAIDS, antiplatelet agents that may contribute to bleeding.

E. For patients on home oxygen via nasal cannula, place the cannula in the patient's mouth while the nares are compressed for active bleeding.

Eye Emergencies

HX	PE	DDX
Mechanism of injury Timing of the injury Current vision (can t hey see?) Status of vision prior to injury (e.g. eyeglasses, contacts, glaucoma etc) Eye protection First aid rendered If chemical burn, what was the material or product.	Visual Acuity (each eye separately) External Exam (upper and lower eyelids) Extraocular movements Eye Sclera (obvious penetration) Cornea (blood, cloudy) Blood in anterior chamber Pupils	Penetrating Corneal burns Corneal abrasion / foreign body Blow out fracture to eye

Treatment:

A. In order to decrease intraocular pressure, patients should be transported sitting at least a 30 degree angle unless contraindicated.
B. Monitor vital signs.
C. Treat specific injuries as follows:
  1. Chemical Exposure.
    a. Administer proparacaine.
    b. Irrigate from the center of the eye towards the eyelid with lactated ringer's (preferred), isotonic saline or tap water for at least 30 minutes.
    c. Do not attempt to neutralize acids or bases.
  2. Direct Trauma to Eye (Suspected Rupture/Penetration of Globe)
    a. Protect affected eye with a hard shield or similar device and cover the other eye.
    b. Follow ***Pain Management*** Protocol, as indicated and consider ondansetron per ***Nausea and Vomiting*** Protocol.
  3. Superficial Foreign Body Sensation.
    a. Do not wipe eye.
    b. Administer proparacaine.
    c. Consider irrigation with Lactated Ringer's, isotonic saline or tap water for 30 minutes, or until foreign body is removed.

Hyperthermia/Heat-Related Emergencies

HX	PE	DDX
Onset of symptoms Environmental temperature / humidity Physical activity Muscle cramps Weakness Headache / syncope Drugs Medications	LOC Sweating (present or absent) Skin Neuro	Heat stroke Drugs (cocaine etc) Sepsis CVA Primary seizure disorder Encephalitis / meningitis Malignant hyperthermia See below for heat illness DDX

Differentiate between heat cramps, heat exhaustion, and heat stroke

Heat Cramps
- Awake / oriented
- Localized muscle cramping
- Normal or slightly elevated body temperature
- Warm, moist skin
- Mild tachycardia
- BP normal

Heat Exhaustion
- Awake or very mildly confused
- Generalized weakness, N/V, headache
- Core (rectal) temperature < 40.5°C (104.9°F)
- Cool, profuse sweating
- Mild to moderate tachycardia
- BP normal or slightly low

Heat Stroke
- Confusion, AMS, Seizure
- Dry hot or wet skin
- Core (rectal) temperature > 40.5°C (104.9°F)
- Severe tachycardia
- Hypotension

- Remove from source
- Remove clothing
- Begin cooling measures (e.g. spray bottle, cool wipes and fans)
- Place ice packs to groin and axilla if available
- IV LR bolus (ideally with cold saline)
- Initiate transport

If these methods are not available and/or feasible.

Prioritize treatment over transport:
- Initiate immediate cooling measures.
- Rectal temperature if available; monitor rectal temperature continuously. Stop active cooling at 38.9°C (102°F).
- Rectal temperature if not available, initiate treatment on scene for up to 30 minutes or until improvement of symptoms (e.g. mental status) or until shivering occurs.
- IV LR bolus (chilled LR if available).
- There is no role for antipyretics (e.g., acetaminophen, ketorolac).

Cooling methods if available and feasible (in order of preference):

1. Cold-Water Immersion (CWI) – Immerse the patient in a tub/basin of cold water. Agitate water continuously until the core temperature reaches 38.9°C (102°F).
2. Tarp-Assisted Cooling with Oscillation (TACO) – Wrap the patient in a tarp or bag, add ice water, and oscillate to enhance skin contact.
3. Continual deluge/dousing with cold water from hose or other cold-water source.
4. Rotating ice water-soaked towels or sheets.

NOTES & PRECAUTIONS:

- **Heat stroke is a life-threatening emergency**. Immediate cooling on scene is critical to prevent further brain damage. Be aware that heat exhaustion can progress to heat stroke.
- Athletic trainers are familiar with rectal temperature monitoring and can provide assistance.
- Wet sheets over a patient without good airflow will increase temperature and should be avoided.
- Suspect hyperthermia in patients with altered mental status or seizure on a hot, humid day.
- Vecuronium and Rocuronium is strongly preferred given the risk of malignant hyperthermia with succinylcholine administration.

Feature	Heat Cramps	Heat Exhaustion	Heat Stroke
Estimated Temperature	Normal to < 38.9°C (102°F)	38°–40°C (100.4°–104°F)	> 40°C (104°F)
Mental Status	Normal	Mild confusion, dizziness, headache	Altered mental status: confusion, agitation, delirium, seizures, coma
Heart Rate	Elevated (mild)	Tachycardia	Markedly elevated, possibly arrhythmic
Blood Pressure	Normal	Orthostatic hypotension common	Hot, flushed, dry (but may be moist early on)
Skin Appearance	Moist, sweaty	Cool, pale, clammy	Hot, flushed, dry (but may be moist early on)
Sweating	Present	Profuse	Absent or decreased (late)
Other Symptoms	Muscle cramps (esp. legs/abdomen), thirst	Weakness, nausea, vomiting, fatigue	Anhidrosis, seizures, ataxia, collapse
Primary Cause	Electrolyte loss and dehydration	Volume depletion and vasodilation	Thermoregulatory failure of CNS
Management	Rest, oral fluids with electrolytes	Rest, cool environment, oral/IV hydration	Medical emergency: rapid cooling, ICU-level care
Risk of Death	None	Low, unless progresses	High without immediate treatment

Hypothermia

HX	PE	DDX
Environmental Exposure (submersion, cold environmental) Underlying medical conditions Elderly Infants, neonates Sepsis Shock Starvation Endocrine (diabetes, hypothyroid) Medications Spinal cord injury Burns	LOC Presence or absence of spontaneous respiration, oxygen saturation (if obtainable) Pulse (rate) ECG (underlying rhythm wide/ narrow QRS)	Etiology: Increased heat loss (environment, burns, prolonged extrication etc) OR Decrease heat production (starvation, age extremes etc) Severity of hypothermia best assessed by: Mental status Orientated: Mild Confused, disorientated: Moderate Comatose: Severe ECG QRS duration Narrow: Mild Sinus brady: Moderate Severe bradycardia (<40) Wide QRS: Severe Consider underlying medical conditions if no environmental factors.

Treatment:

A. Start O_2, follow ***Airway Management*** procedure with the following exception:
  1. Manage airway with BVM.
  2. If oral intubation is necessary, proceed carefully.
    a. If jaw is difficult to open, use BVM.
    b. Paralytics should not be used in these patients.

B. Remove all wet clothing as soon as possible and provide patient with warm blankets. Place patient in a heated environment as soon as possible.

C. Start IV/IO as needed, if possible infuse warmed IV/IO fluids (99° to 113° F).

D. Patients who are profoundly hypothermic, (Patient "A"), may require pump rewarming; call OLMC for direction.

E. Apply AED or cardiac monitor, if available, and use the following guidelines.
  1. Patient "A" — Disorganized ECG rhythm, no pulses, follow appropriate ***Cardiac Arrest*** algorithm:
    a. CPR is advised for these patients.
    b. Call OLMC for direction regarding resuscitation and before administering any medications.
  2. Patient "B" — Organized ECG, with or without palpable pulses, handle gently.

F. No CPR or pacing if patient is bradycardic, call OLMC for direction regarding resuscitation and before administering any medications.

Specific Precautions:

A. In the profoundly hypothermic patient, medications may not be effective until circulation is adequately restored. Repeat dosages of medications commonly given during a standard arrest sequence may not be advised.

B. Search and Rescue teams may use protocols that apply to the wilderness environment. It is recognized that they may not be able to contact OLMC for direction when so stated in the protocol.

Musculoskeletal Injuries

HX	PE	DDX
Mechanism of injury (location, time) Area of greatest pain Loss of consciousness Restriction on normal function (i.e. able to walk, move arm etc)	LOC Neck/ spine pain Extremity exam (lacerations, swelling, discoloration, deformity, crepitus, angulation, amputation, restriction on range of motion) Pulse Capillary refill Neuro deficit	Strain Minimal swelling, mild tenderness Sprain Moderate to severe swelling, severe tenderness, inability to bear weight (weight bearing joints) Possible fracture All above + Deformity

Spinal Immobilization

Treatment:

A. Provide initial cervical spine immobilization using manual in-line stabilization.

B. Immobilize using a **Full Spinal Immobilization** or **Spinal Motion Restriction** (see ***Selective Spinal Immobilization*** protocol) if the patient has a mechanism with the potential for causing spinal injury and meets ANY of the following clinical criteria:

1. Altered mental status.
2. Evidence of intoxication.
3. Distracting pain/injury (extremity fracture, drowning, etc.).
4. Neurological deficit (numbness, tingling, paralysis).
5. Spinal pain or tenderness.
6. Distracting situation (communication barrier, emotional distress, etc.).

C. Complete a secondary exam to include serial neurological status after immobilization.

D. Treat pain per ***Pain Management*** protocol.

Specific Precautions:

A. If any immobilization techniques cause an increase in pain or neurological deficits, immobilize patient in the position found or position of greatest comfort.
B. Carefully assess the patient's respiratory status during transport. Loosen straps as needed to avoid respiratory compromise.
C. Comorbid age factors (< 12 or > 65 yrs) may impact the EMS Provider's ability to assess the patient's perception and communication of pain. A conservative approach to immobilizing these patients is strongly recommended.
D. Patients in the third trimester of pregnancy should have the right side of the backboard elevated six inches.
E. Pad backboards for all inter-facility transports. Consider padding backboards for prolonged scene transports.
F. If sports injury, immobilize patient per the ***Sports Equipment Removal*** procedure.

Amputation:

A. If amputation is above the wrist or ankle, enter the patient into the **Trauma System.**
B. Cover stump or partial amputation with sterile dressing, saturate with sterile Normal Saline and cover with dry dressing.
  1. Partial amputations should be splinted in anatomical position to avoid torsion and angulation.
  2. Control bleeding by direct pressure, indirect pressure and/or elevation, hemostatic dressings and/or tourniquet.
C. Wrap severed part in sterile dressing, place in plastic bag or wrap in plastic and keep dry.
  1. Place bag in ice water combination without salt, if available.
  2. Time is of the greatest importance to assure viability, if the transport time will be prolonged due to extrication or other circumstances, consider sending the amputated part ahead to be surgically prepared for reimplantation.

Sprains, Possible Fractures and Dislocations:

A. Check for pulses, movement and sensation (PMS) in the extremity distal to the injury site both before and after immobilization.
B. If pulses are absent distal to fracture/dislocation, apply axial traction to bring extremity into a more normal anatomical position. Once pulse is restored, immobilize extremity.
C. For suspected pelvic fracture, follow ***Pelvic Wrap*** procedure if indicated.
D. Elevate and apply ice or cold packs if time and extent of other injuries allow.

Open Fractures:

A. Control bleeding by direct pressure, indirect pressure and/or elevation, hemostatic dressings and/or tourniquet.
B. Apply sterile dressing.
C. Saturate with sterile Normal Saline.
D. Cover with dry dressing.
E. If the fracture/dislocation is open or involves a joint, splint in place unless neurovascular compromise is present distal to the fracture site.

Femur Shaft Fracture:

Apply traction splint for immobilization.

Pain Control for Isolated Extremity Injuries:

A. Consider fentanyl 25-100 micrograms IV/IO/IN; may repeat every 3-5 minutes as needed to a MAX of 400 micrograms. Or, fentanyl 25-100 IM; may repeat every 15 minutes to a MAX of 400 micrograms.

Pediatric Considerations:

1. Small children may require extra padding under the shoulders.
  a. Children require extra padding behind the T-spine and shoulders and are best immobilized on a pediatric backboard.
  b. If using an adult backboard:
    i. Since the pediatric patient is at risk of sliding from side to side on a backboard, it is recommended that the EMS Provider place rolled up blankets or other dense, soft support material on both sides of the pediatric patient prior to securing the chest and hip straps.
    ii. The location of the straps on the backboard may have to be adjusted so they securely hold the pediatric patient in place and do not compress the abdomen.
2. Fentanyl dose for children < 40 kg: 1 microgram/**kg** IV, IO. May repeat with 0.5-1 microgram/**kg** every 3-5 minutes as needed to a MAX total dose of 4 micrograms/**kg**. Or, fentanyl 2 micrograms/**kg** IM/IN; may repeat every 15 minutes to a MAX total dose of 4 micrograms/**kg**.
If ≥ 40 kg follow adult dosing.

Note:

- If an improvised tourniquet is present before medical provider arrival, place a commercial tourniquet per protocol and remove improvised tourniquet if operationally feasible.

Nausea and Vomiting

HX	PE	DDX
Onset, duration, total number Blood, bile? Associated symptoms (abdominal pain, headache, dizziness, pain, neuro symptoms) Pregnancy Medications, allergies	LOC Neuro deficits Abdominal exam Ataxia	CNS (migraine, CVA) Vestibular (vertigo, dizziness, middle ear) Cardiac: Acute MI Eye (blurred vision) GI (gastroenteritis) Pregnancy Severe pain (MI, renal stone, fracture, trauma) Medication

Treatment:

A. Start O_2, follow ***Airway Management*** procedure, as indicated.
B. Start IV if needed; if shock syndrome is present follow ***Shock*** protocol.
C. Consider fluid challenge in patients exhibiting signs of dehydration.
D. Consider offering patient an isopropyl alcohol swab and allowing the patient to self-administer the swab by inhalation. Emphasize slow deep inhalation. May be repeated up to 2 times (total of 3 administrations) but should not delay the administration of ondansetron.
E. Administer 8 mg ondansetron orally dissolving tablets (Zofran ODT) or 8 mg ondansetron slow IV push over 2 minutes or IM.
  1. If nausea and/or vomiting are inadequately controlled after 10 minutes, may repeat ondansetron for a total of 2 doses.
  2. If ondansetron unavailable or patient has a known allergy to ondansetron, consider prochlorperazine (Compazine) 5-10 mg slow IV push over 2 minutes or IM (pediatric 2.5 mg IM ONLY). If extrapyramidal reactions are observed, administer diphenhydramine 25-50 mg IV/IM (1 mg/**kg** pediatric).
  3. If ondansetron and prochlorperazine (Compazine) unavailable or if the patient has a known allergy to ondansetron and prochlorperazine, administer diphenhydramine 25-50 mg IV/IM (1 mg/**kg** pediatric).
F. If patient continues to vomit administer fluid challenge and consider other causes.

Priority of medications for control of nausea and vomiting*

Priority	Medication	Dose (Adult)	Dose (Pediatric)
1st	Isopropyl alcohol swab	Self-administered, inhalation	Self-administered, inhalation
2nd	Ondansetron (Zofran)	8 mg (may repeat x1) IV, IM or ODT	0.1 mg/kg IV, IM to MAX of 4 mg or 4 mg ODT
3rd	Prochlorperazine (Compazine)	5 - 10 mg IV, IM	2.5 mg IM ONLY
4th	Diphenhydramine	25 - 50 mg IV, IM	1 mg/kg to MAX of 50 mg

* If allergic to medication, go to next medication in priority list.

Specific Precautions

A. Do not administer ondansetron (Zofran®) to patients with a hypersensitivity to the drug or other 5-HT3 type serotonin receptor antagonists (i.e., dolasetron [Anzemet®] and granisetron [Kytril®])
B. Do not administer with alkaline medications or preparations, which may cause precipitation.
C. Ondansetron may result in QT prolongation. Use with extreme caution in patients with prolonged QT-interval. If this is known, cardiac monitor must be applied.

Pediatric Considerations

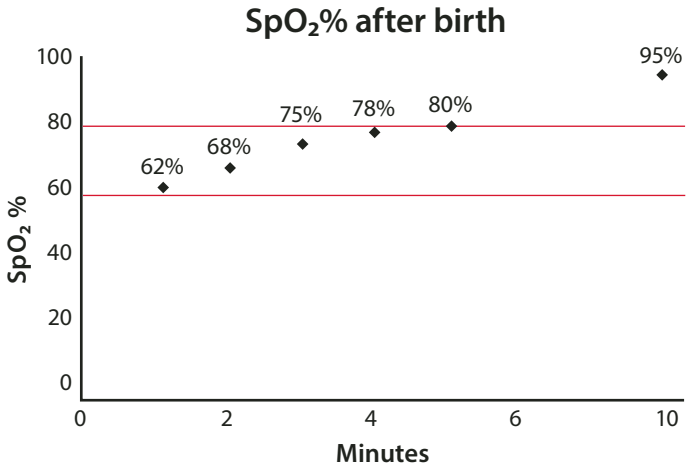
1. Ondansetron use in patients under 2 years of age requires OLMC consultation except for children in spinal immobilization or children receiving chemotherapy.

2. For children 2-12 years of age, administer one (1) 4 mg ondansetron orally dissolving tablet (Zofran® ODT) or administer 0.1 mg/kg IV/IO to a MAX of 4 mg.
Consider IM at same dose if unable to start IV and ODT tablet is contraindicated.

Neonatal Resuscitation

HX	PE	DDX
Painful bleeding in mother (Abruptio Placentae) Prolonged rupture of membranes Maternal fever, hypertension, edema, seizures	Meconium-stained fluid Prolapsed cord APGAR score	Initial questions: • Amniotic fluid clear of meconium? • Breathing or crying? • Good muscle tone? • Pink color? • Term infant? Management priorities: • Provide warmth • Clear, open airway • Dry, stimulate infant • Oxygen

Expected oxygen saturation of full term newborn



Target Oxygen Saturation Table

1 minute	60% - 65%
2 minute	65% - 70%
3 minute	70% - 75%
4 minute	75% - 80%
5 minute	80% - 85%
10 minute	85% - 95%

3:1

BIRTH

30 seconds

- Is this a term gestation?
- Is the infant breathing or crying?
- Does the infant have good muscle tone?

Yes → **Routine Care**
- Warm and dry infant
- Clear airway if needed
- Assess APGAR
- Follow Normal Childbirth protocol

No

- Warm and dry/stimulate infant
- Position airway and suction as needed

30 seconds

Evaluate respirations, heart rate, color

Breathing HR > 100 Pink →
- Observe
- Assess APGAR
- Follow Normal Childbirth protocol

Apneic, gasping or HR < 100

Breathing HR > 100 central cyanosis

Monitor for central cyanosis

Patient pink →

Continue to assess and support ABCs

Persistant Cyanosis after 2 min

Provide positive pressure ventilation - 40-60 breaths per minute for 30 seconds

Effective ventilation HR > 100 and Pink

HR < 60

HR > 60

2 Minutes

- Begin chest compressions and ventilations with a 3:1 ratio respectively (90 compressions and 30 ventilations per minute).
- Provide positive pressure ventilations with 100% oxygen.*

HR < 60

- Establish vascular access.
- Administer 1:10,000 Epinephrine 0.01 mg/**kg** IV, IO. Repeat every 3-5 minutes.
- Establish advanced airway with 100% oxygen.
- If amniotic fluid is meconium stained AND no chest rise with BVM, consider tracheal suction.
- Administer fluid challenge with normal saline/LR 10 mL/**kg** if acute blood loss or hypotension.
- Check Capillary Blood Glucose. For glucose less than 40 mg% follow the ***Altered Mental Status*** protocol **as excerpted below:**
  - **a.** *If IV, IO established, give D10; 5 mL/**kg** (0.5 gram/**kg**) for neonates, infants, and children. May repeat once.*

* **Consider endotracheal intubation.**

Notes and Precautions

A. Do not use atropine in neonatal resuscitation.

B. If meconium is lightly stained and infant is vigorous (strong respiratory effort, good muscle tone, heart rate > 100 bpm) endotracheal suctioning should not be performed.

C. 100% oxygen should not be used to initiate resuscitation. Begin resuscitation with room air and add supplemental oxygen if infant remains cyanotic or oxygen saturation less than 70% after 2 minutes. Expected oxygen saturation immediately after full newborn birth ranges between 70% to 85% within the first 5 minutes. Most full or near term infants will have oxygen saturation of 90% by 5 minutes. If supplemental oxygen is needed after 5 minutes, attempt to keep oxygen saturation between 90% to 95%.

D. An infant may need resuscitation if intrapartum risk factors for asphyxia are present (prolapsed cord, painful bleeding, prolonged rupture of membranes, maternal fever, multiple births, abnormal presentation, maternal hypo-hypertension or seizure).

E. To monitor HR, either auscultate heart tones or use 4-lead ECG. Palpation of HR is unreliable and intermittent.

F. Check blood glucose and follow ***Altered Mental Status and Coma*** protocol.

Meconium Aspiration:

The presence of meconium-stained amniotic fluid may indicate fetal distress and increases the risk the baby will require resuscitation after birth. Routine laryngoscopy with or without intubation for tracheal suction is not recommended.

Meconium-Stained Fluid and Vigorous Newborn:

If the baby is vigorous with good respiratory effort and muscle tone, the baby may stay with the mother to receive the initial steps of newborn care.

Meconium-Stained Fluid and a Non-vigorous Newborn:

If the baby is born through meconium-stained amniotic fluid and has depressed respiration or poor muscle tone, resuscitative efforts should be initiated.

A. If the baby is not breathing or heart rate is less than 100 bpm after initial assessment, then proceed with bag valve mask (BVM), assuring a good seal around the mouth and nose.

B. If BVM does not inflate the lungs and airway obstruction is suspected, then intubation with tracheal suctioning is indicated.

Procedure of Meconium Tracheal Suctioning:

A. Suction the mouth, nose and posterior pharynx, using a 10 French or larger catheter hooked to machine suction, after the infant has been delivered.

B. Secure protected airway, intubate the infant with the appropriately sized endotracheal tube and suction with a meconium suction adapter or use a specially designed meconium aspiration catheter/endotracheal tube (such as a Neovac™ type device).

1. Suction should not last more than 3 to 5 seconds.

a. Do not suction with your own mouth!

b. Use the portable suction or wall suction if available at 80-100 mmHg.

Procedure for Suctioning the Mouth and Nose of the Newborn:

A. Vigorous newborns that are breathing or crying and have good muscle tone do not need to have their mouth and nose suctioned. Gentle suction should be reserved for babies who have difficulty in clearing their secretions, who are not breathing or crying, have poor muscle tone, have suspected airway obstruction or require BVM.

B. Use a bulb syringe to clear the secretions from mouth (first) and then nose (second).

OB/GYN Emergencies

HX	PE	DDX
Last menstrual period Pregnancy • Single or multiple • Due date • Abdominal pain/ contractions (timing/ duration) • Ruptured membranes Seizures Hypertension Vaginal bleeding Past medical /OB Hx	Hypertension Edema Abdominal exam Vaginal bleeding If possibility of delivery exists, inspect perineum for bleeding, fluid (not color), crowning or abnormal presentation Do not perform a digital exam	Vaginal bleeding Early pregnancy Ectopic pregnancy Spontaneous abortion Late pregnancy Abruptio placenta Placenta previa HTN/headache/edema/seizures Eclampsia/pre-eclampsia

General Treatment:

A. If multiple, or abnormal birth, consider second transport unit.
B. Start O_2 in all abnormal deliveries. Follow ***Airway Management*** procedure.
C. If in third trimester, transport on left side (pillow under right hip, or, if on backboard, tilt right side of board up 6 inches) to keep uterine pressure off inferior vena cava unless delivery is imminent.
D. Start IV/IO as needed. Vital signs may not be a reliable indicator of shock or respiratory distress in the pregnant patient.
E. If mother confirms single pregnancy by prenatal ultrasound, administer oxytocin 10 units IM or IV/IO over 5 minutes.
F. Administer TXA 2 gm IV/IO if shock is present.
G. Acute onset severe hypertension in pregnant and postpartum women.
1. Includes all pregnant women and up to 6 weeks postpartum with symptoms.
2. Symptoms include headache, visual disturbances, chest discomfort, shortness of breath, confusion, abdominal pain.
3. Notify receiving hospital of patients with a sustained elevation in BP ≥ 140 mmHg systolic and/or ≥ 100 mmHg diastolic are present for at least 15 minutes or more.
4. Initiate treatment (if feasible) if sustained elevation in BP > 160 mmHg systolic and/or ≥ 110 mmHg diastolic (either one or both) persists for at least 15 minutes or more.

Treatment options:
Labetalol (if available)
1. Administer Labetalol 10 mg slow IV push over 1-2 minutes.
2. Target systolic BP 140-150 mmHg and diastolic BP 90-100 mmHg.
3. Labetalol may be repeated twice (up to 3 total doses) every 15 minutes (doubling doses if needed depending on effect of preceding dose; e.g. 1st dose - 10mg, 2nd dose - 20mg, 3rd dose - 40mg).
4. Stop administration if HR < 60 bpm or other adverse effects.
5. Maximum dose of Labetalol is 70 mg.

6. Formulation 4 mL (5 mg/mL total 20 mg) Carpuject Sterile cartridge.

H. Seizures (eclampsia) follow ***Seizure*** protocol.

1. Consult OLMC for administration of magnesium sulfate.

Childbirth:

A. Normal child birth

1. Use sterile or clean technique.

2. Guide and control – but do not retard or hurry – delivery.

3. Check for cord around baby's neck and gently remove if found.

4. After delivery, assess infant per ***Neonatal Resuscitation*** protocol. Assess infant using APGAR at time of birth and five minutes later. Documentation should describe the infant using criteria rather than giving a numerical score. If no resuscitation is needed (term infant, breathing or crying, good muscle tone), proceed as below.

5. Do not suction infant's nose and mouth unless there is meconium present and the infant is depressed; or there is a need to clear the airway.

6. Briefly dry infant and place on mother's chest, in skin-to-skin contact. Cover both with a clean, dry blanket.

7. At 1 to 3 minutes after delivery, clamp and cut the umbilical cord about 6 inches from infant. If resuscitation is needed, cord may be clamped and cut after 1 minute.

8. If mother confirms single pregnancy by prenatal ultrasound, administer oxytocin 10 units IM or IV/IO over 5 minutes.

9. Do not delay transport to deliver the placenta. After the placenta has delivered, gently externally massage uterus to encourage contraction and prevent bleeding.

10. If mother has significant postpartum hemorrhage (> 500 mL), continue uterine massage, treat for shock, administer TXA 2 gm IV/IO slow push, and update receiving facility.

11. Unless infant needs treatment, keep on mother's chest for transport. Monitor vital signs of mother and infant during transport.

B. Abnormal Childbirth

1. General:

a. Transport to nearest appropriate hospital.

b. Give receiving hospital earliest possible notification.

c. Contact OLMC for advice.

d. Transport position as in General Treatment #3 above.

2. Breech Presentation (buttocks first):

a. If delivery is imminent, prepare the mother as usual and allow the buttocks and trunk to deliver spontaneously, then support the body while the head is delivered.

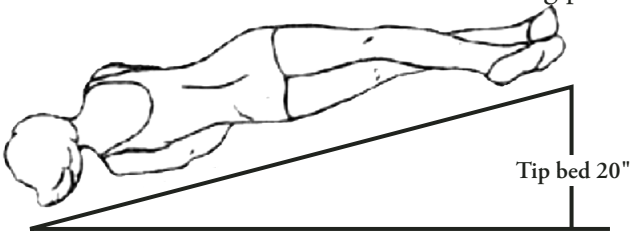
b. If the head is not delivered within 3 minutes, suffocation can occur:

i. Place your gloved hand in the vagina, with your palm toward the baby's face.

ii. Form a "V" with your fingers on either side of the baby's nose and push the vaginal wall away from the baby's face to create airspace for breathing.

c. Assess for presence of pulse in umbilical cord, if presenting.

3. **Prolapsed cord:**
   - **a.** With a gloved hand, gently attempt to push the baby up the vagina several inches.
   - **b.** Do not attempt to push the cord back.
   - **c.** Place the mother in left lateral Trendelenburg position.



   - **d.** If the cord is visible, gently displace presenting part of baby off cord and maintain displacement. DO NOT pull or over-handle cord in order to prevent cord compression and spasm.

4. **Limb presentation:**
   - **a.** The presentation of an arm or leg through the vagina is an indication for immediate transport to the hospital.
   - **b.** Assess for presence of pulse in umbilical cord, if presenting.
5. **Abruptio Placentae:** occurs in the third trimester of pregnancy when the placenta prematurely separates from the uterine wall leading to intrauterine bleeding.
   - **a.** The patient experiences lower abdominal pain and the uterus becomes rigid.
   - **b.** Shock may develop without significant vaginal bleeding.
6. **Placenta previa:** occurs when the placenta covers the cervical opening and can result in vaginal bleeding and prevents delivery of the infant through the vagina. The infant needs to be delivered via C-section.

Notes and Precautions:

A. Always consider the possibility of ectopic pregnancy in a woman of child-bearing age with abdominal pain or vaginal bleeding. The patient may decompensate quickly due to internal blood loss.

B. APGAR Criteria:

Sign	0	1	2
Appearance:	Blue, pale	Body pink, extremities blue	Completely pink
Pulse:	Absent	Slow (less than l00)	Greater than or equal to 100
Grimace:	No response	Grimace	Cough or sneeze
Activity:	Limp	Some flexion	Active motion of extremities
Respirations:	Absent	Slow, irregular	Good, crying

Pain Management

ACUTE	CHRONIC	PRINCIPLES OF MANAGEMENT
Is a symptom of illness or injury Serves a biological purpose Is associated with identifiable pathology Is present for less than 6 months	Is the problem Has no biological function May or may not be associated with identifiable pathology Is present for more than 6 months	Pain is best treated early Untreated or under treated pain produces more pain Analgesia and a search for the cause of the pain should happen simultaneously Pain scales should be used routinely

Treatment:

For acute pain and uncontrolled chronic pain:

A. Consider oxygen per ***Airway Management*** protocol.

B. Monitor vital signs and level of consciousness, consider ECG monitor.

C. Establish venous access if indicated. Determine location of pain and severity using numeric scale (1-10) or Faces scale.

D. Consider and treat underlying cause of pain.

E. Use non-pharmacological pain management (i.e., position of comfort, hot/cold pack, elevation, splinting, padding, wound care, therapeutic calming and communication).

Recommendations for the administration of pain management.

1. Ketorolac or fentanyl should be used as first line agents for severe pain. Do not administer ketorolac to trauma system entry patients.
2. Ketamine can be used as a first line agent for patients who are:
   - **a.** Prescribed opiates for chronic pain.
   - **b.** Use illicit opiates on a continued basis.
   - **c.** Are prescribed methadone, buprenorphine (Suboxone, Zubsolv, Bunavail), naltrexone.

F. Administer pain medication:

1. **Mild to moderate pain** (Ex: 1-4 on Pain scale)
   - **a.** Acetaminophen 1000 mg PO or slow IV push (over 60 seconds) or
   - **b.** Ibuprofen 600 mg.
2. **Moderate to severe pain** (Ex: 5-8 on Pain scale)
   - **a.** Ketorolac 15 mg IV or 30 mg IM (2-64 years old)
3. **Severe pain** (Ex: 9-10 on Pain scale)
   - **a.** Ketorolac 15 mg IV or 30 mg IM

-OR-

b. Fentanyl 25-100 micrograms IV/IO/IN; may repeat every 3-5 minutes as needed to a MAX of 400 micrograms. Or, fentanyl 25-100 IM; may repeat every 15 minutes to a MAX of 400 micrograms.

-OR-

c. Sufentanil 5-10 micrograms IV/IO; may repeat every 3-5 minutes as needed to a MAX of 40 micrograms. Or, sufentanil 5-10 micrograms IM; may repeat every 15 minutes as needed to a MAX of 40 micrograms.

-OR-

d. Morphine 2-8 mg IV/IO every 3-5 minutes to a MAX of 20 mg. Or, morphine 5-10 mg IM; may repeat 5 mg every 10-15 minutes to a MAX of 20 mg

-OR-

e. Ketamine 15 mg IV/IO/IM (Administer one time dose of midazolam 2.5 mg IV/IO/IM in adults to prevent/treat negative emergence reaction.)

Do not administer pain medications if any of the following are present:

a. Respiratory distress or O_2 saturation of < 90%
b. Known allergy to pain medications
c. Altered mental status
d. Systolic blood pressure of < 100 mm/Hg

G. Obtain a full set of vital signs and pain scale rating prior to and after each administration of pain medication.

Pediatric Considerations:

1. **Mild to Moderate pain:**
   a. If no contraindication to oral medication, consider acetaminophen 15 mg/**kg** PO to a MAX of 1000 mg or ibuprofen 10 mg/**kg** PO to a MAX of 600 mg, if available.
2. **Mild to Moderate pain:**
   a. Ketorolac dose for pediatrics (<40 kg) is 0.5 mg/**kg** IV (MAX dose of 15 mg) or 1 mg/**kg** IM (MAX dose of 30 mg). Do not exceed adult dose. Do not repeat.
3. **Severe pain:**
   a. Fentanyl 2 micrograms/**kg** IM/IN; may repeat every 15 minutes to a MAX total dose of 4 micrograms/**kg**. Do not exceed adult dosing.

   -OR-

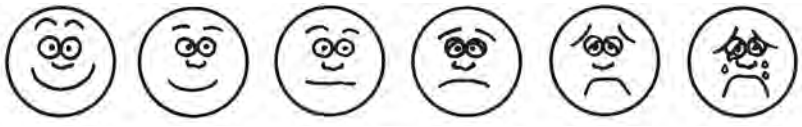
   b. Sufentanil 0.1 micrograms/**kg** IV/IO/IM; may repeat every 3-5 minutes as needed to a MAX of 10 micrograms. Do not exceed adult dosing.

   -OR-

   c. For children under 20 kg, morphine 0.1 mg/**kg** IV or IM. May repeat every 3-5 minutes. Do not exceed adult dosing.
4. Contact OLMC if MAX dose of either medication is reached without adequate pain management.

Pain	Pain Scale	Medication Dose (Adult)	Medication Dose (Pediatric)
Mild to Moderate	1 - 4	Acetaminophen 1000 mg PO/ slow IV push (over 60 seconds) **-OR-** Ibuprofen 600 mg PO	Acetaminophen 15 mg/**kg** PO (MAX of 1000 mg) **-OR-** Ibuprofen 10 mg/**kg** PO (MAX 600 mg)
Moderate to Severe	5 - 8	Ketorolac 15 mg IV or 30 mg IM	Ketorolac 0.5 mg/**kg** IV or 1 mg/**kg** IM (MAX of 30 mg)
Severe	9 - 10	Ketorolac 15 mg IV or 30 mg IM **-OR-** Fentanyl 25-100 micrograms IV/IO/IM (MAX of 400 micrograms) **-OR-** Sufentanil 5-10 micrograms IV/IO/IM (MAX of 40 micrograms) **-OR-** Morphine 2-8 mg IV/IO/IM (MAX of 20 mg) **-OR-** Ketamine 15 mg IV/IO/IM (with midazolam 2.5 mg)	Fentanyl 2 micrograms/**kg** IM/IN (MAX of 4 micrograms/**kg**) **-OR-** Sufentanil 0.1 micrograms/**kg** IV/IO/IM (MAX of 10 micrograms) **-OR-** If <20 kg, Morphine 0.1 mg/**kg** IV/IO/IM

Faces Pain Scale



0 No Hurt | **2** Hurts Little Bit | **4** Hurts Little More | **6** Hurts Even More | **8** Hurts Whole Lot | **10** Hurts Worst

Poisons and Overdoses

HX	PE	DDX
Type of ingestion or exposure What, when, how much Multiple patients with similar symptoms Reason for ingestion (accidental or intentional) Action by bystanders Previous similar events or known exposure with MSDS sheets	LOC Pupils Breath (odor) Temperature (hyper/hypothermic) Neuro status ECG (rate, rhythm, QRS duration)	See toxidromes

Treatment: **[Consider HAZMAT Response]**

A. Consider use of any of the following protocols:
1. ***Hazardous Materials -- Multiple Toxic Exposure***
2. ***Hazardous Materials Treatment,*** if trained and authorized
3. ***Mass Casualty Incident***
4. ***Staging for High Risk Response***

B. External Contamination:
1. Protect medical personnel with proper PPE.
2. Remove contaminated clothing.
3. Brush off any solid material from the skin.
4. Flush contaminated skin and eyes with copious amounts of water.

C. Internal Ingestion:
1. Assess and support ABCs.
2. Start O_2 follow ***Airway Management*** procedure.
3. Start IV/IO if needed and follow ***Shock*** protocol.
4. If patient is poorly responsive or has depressed respirations:
   - **a.** Determine blood glucose and follow ***Altered Mental Status and Coma*** protocol.
   - **b.** If no IV/IO has been established, administer naloxone 2 mg IM/IN.
   - **c.** If IV/IO already established, administer naloxone 0.5 mg IV/IO and observe for improved ventilations, IV/IO dose may be repeated every 2 minutes up to 2 mg.
   - **d.** In most instances, a total dose of 2 mg IM/IN or IV/IO will be sufficient to reverse opioid intoxication. In some cases (methadone or designer drugs), larger doses of naloxone may be necessary. In these cases, additional doses of naloxone (2 mg IM/IN or IV/IO every 3-5 minutes) up to a MAX of 8 mg of naloxone may be administered to reverse opioid intoxication.
5. Monitor cardiac rhythm and follow ***Cardiac Dysrhythmia*** protocol.

D. Specific Poisonings:

1. See table D.1 Toxidomes below.

2. Treat specific **symptomatic** poisoning/overdose patients as outlined below:

Aspirin or acetaminophen:

1. If it is less than two hours since ingestion, administer 1 gram/**kg** of activated charcoal PO/NG to a max of 50 grams.

2. If ingestion involves more than just aspirin and/or acetaminophen contact OLMC for use of activated charcoal.

3. Avoid intubating aspirin overdoses unless absolutely necessary. If intubation becomes necessary, the ventilation goal should be to maintain pre-intubation $EtCO_2$ levels.

Beta blockers:

Treat symptomatic bradycardia and/or hypotension with push dose epinephrine. Consider epinephrine drip at 2 – 10 mcg/min. Titrate to MAP of >65 or HR >50 bpm.

Calcium channel blocker:

Calcium gluconate, 1-3 g slow IV/IO over 30-60 seconds.

Carbon Monoxide:

1. Measure patient CO level with SpCO monitor when possible.

2. Place all symptomatic CO poisoning patients on CPAP with high flow O_2.

3. Recommend NRB with nasal cannula if contraindications or if patient does not tolerate CPAP.

4. All suspected carbon monoxide exposure patients with a SpCO level ≥ 15 (RAD-57) **and** exhibit severe symptoms of CO poisoning symptoms (e.g. chest pain, confusion, lethargy, coma, syncope, seizures, loss of consciousness, new neurological deficits -OR- pregnancy) should be transported to the designated hyperbaric chamber(s) if available, or nearest facility, for stabilization.

5. All other mildly symptomatic patients (e.g. headache, dizziness, nausea) should be transported to the closest emergency department.

	Clinical presentation	**Clinical presentation**	**Clinical presentation**	**Clinical presentation**
Carbon Monoxide	Yes	Yes	Yes	Yes
Burns	No	Yes	No	Yes
Trauma	No	No	Yes	Yes
Destination	Hyperbaric Chamber	Burn Center	Trauma Center	Trauma Center

Carbon Monoxide = Yes (≥ 15)
Burns = Meets Burn Center criteria
Trauma = Meets Trauma system criteria

6. If cyanide poisoning is also suspected, consider obtaining SpCO, if possible, before administration of Cyanokit® since the latter will interfere with the carboxyhemoglobin monitor.

***If RAD-57 monitor not available, transport suspected CO poisoning patients based on signs and symptoms.

***See ***Hydrogen Cyanide* 70.020** protocol for further details.

Chlorine inhalation:

Treat symptomatic patients with:

1. Albuterol - 2.5 mg nebulized.
2. Dexamethasone - 10 mg IV/IO/IM/PO.
3. Sodium bicarbonate 8.4% - 2.5 ml via nebulizer.

Cyanide:

Hydroxocobalamin (Cyanokit™) 5 g IV/IO over 15 minutes. Repeat once if needed. For cardiac arrest, hydroxocobalamin should be administered as a rapid fluid bolus. Consider Sodium Thiosulfate 50 mL of 25% solution over 10 minutes if Hydroxocobalamin (Cyanokit™) not available.

Hydrofluoric Acid:

1. Take proper PPE precautions prior to treatment of patient with suspected Hydrofluoric Acid.
2. See ***Hydrogen Fluoride* 70.030** protocol for treatment.

Sodium Channel Blockade:

- Tricyclic Antidepressants - imipramine (Tofranil), amitriptyline (Elavil)
- Diphenhydramine (Benadryl)
- Anti-arrhythmics:
  - Type 1a - quinidine, disopyramide
  - Type 1b - lidocaine, mexiletine, phenytoin
  - Type 1c - Flecainide, encainide, propafenone
- Seizure medications (carbamazepine (Tegretol), lamotrigine (Lamictal)

1. If patient exhibits arrhythmias or a widening QRS complex, administer sodium bicarbonate 1 mEq/**kg** IV/IO.
2. Treat hypotension per ***Shock*** protocol.

Pediatric Considerations: [Consider HAZMAT Response]

1. Consider possibility of neglect or abuse.
2. Determine blood glucose and follow ***Altered Mental Status & Coma*** protocol.
3. Activated charcoal dose is 1 gram/**kg** (MAX dose of 100 grams).
4. Naloxone dose is 0.1 mg/**kg**, MAX 2 mg per dose.
5. IV/IO Atropine dose, per OLMC, may be very high in children that have orally ingested organophosphate poisons.

Specific Precautions:

A. Inhalation poisoning, **SLUDGE** symptoms (salivation, lacrimation, urination, defecation, gastrointestinal symptoms and emesis), or acid/alkali exposure may be dangerous to rescuers.
B. Do not neutralize acids or alkalis.
C. SpCO levels may be elevated in smokers. Levels can range from 3-20% depending on the number of packs smoked.
D. Pulse oximeter may provide a false reading in patients with elevated SpCO levels.
E. If the patient exhibits extrapyramidal symptoms/dystonia's with a history of phenothiazine use, consider diphenhydramine.

Table D.1. - Toxidromes

Toxidrome	***Examples***	***Clinical Features***	***Antidotes***
Sympathomimetic	Cocaine Methamphetamine	Agitation Diaphoresis Hypertension Hyperthermia Dilated pupils Tachycardia	Benzodiazepine (OLMC)
Opioid	Heroin Fentanyl Hydromorphone Methadone Oxycodone	Depressed Mental Status Hypoventilation Constricted pupils	Naloxone
Cholinergic (Anti-cholinesterase)	Pesticides • Carbamates • Organophosphates Nerve agents	Muscarinic^{+} Nicotinic^{++} Central^{+++}	Atropine Pralidoxime (HAZMAT, OLMC)
Sedative-Hypnotic	Barbiturates Benzodiazepines GHB	Depressed Mental Status Hypotension Hypothermia	Supportive Therapy (No antidote)
Cardiotoxic Drugs	Beta-blockers Calcium Channel Blockers	Bradycardia Conduction Disturbances Hypotension	Glucagon Calcium
Anticholinergic	Atropine Jimson Weed Scopolamine Diphenhydramine	Delirium Hyperthermia Tachycardia Warm Dry Skin	Physostigmine (ED)
Sodium Channel Blockade	Tricyclic Antidepressants Anti-arrhythmics • Type IA agents (quinidine, procainamide) • Type IC agents (flecanide, propafenone) • Diphenhydramine	Altered Mental Status Hypotension Seizures Wide-Complex Tachycardia	Sodium Bicarbonate (OLMC)
Methemoglobinemia (nitrate/nitrite poisoning)	Contaminated well water (nitrates) Inhalation injuries Topical anesthetics (benzocaine, lidocaine)	Cyanosis SpO_2 75-85% despite supp. O_2 Headache Weakness Seizures/Coma Dysrhythmias Chocolate brown blood	Supportive Care O2 administration Methylene blue (ED)

+Muscarinic:
Diarrhea, Urination, Miosis, Bradycardia, Bronchospasm, Bronchorrhea, Emesis, Lacrimation, Salivation, Secretions, Sweating

++Nicotinic:
Mydriasis, Tachycardia, Weakness, Hypertension, Hyperglycemia, Fasciculations

+++Central:
Confusion, Convulsions, Coma

Psychiatric and Behavioral Disorders

HX	PE	DDX
Recent crises Behavioral change Suicide/homicidal ideation Past medical, psych history Medications Drugs ETOH	Pupils Orientation Mental status exam appearance, behavior orientation affect/ mood, thought (delusions, illogical etc), hallucinations (visual/auditory) memory (recent/past)	Confusion Metabolic (electrolyte) Infectious (encephalitis, sepsis) Neurologic (CVA, tumor) Medication Drug abuse Psych

Treatment:

A. Immediate danger to medical personnel or patient:

1. Follow ***Staging for High Risk Response*** protocol.
2. Protect yourself and others.
3. Summon law enforcement.

B. No evidence of immediate danger to medical personnel or patient:

1. Assess ABCs. Follow ***Airway Management*** procedure, if needed.
2. Assess orientation and level of consciousness, follow ***Altered Mental Status and Coma*** protocol if indicated.

C. General approach to the patient:

1. Show self-confidence and convey concern for the patient.
2. One EMS Provider should establish rapport and interact with the patient.
3. Do not stay alone with the patient. Have enough help to restrain the violent patient. See ***Patient Restraint*** protocol.

Initial Procedure:

A. Assess and assure scene safety.

B. If police or Crisis Intervention Team (CIT) is on scene, EMS assessment and intervention should not be delayed, however, police or the CIT may need to diffuse the situation in order to allow for EMS to safely assess the patient. EMS crews should get an initial report from the officer before approaching the patient. If EMS is first on scene, give an initial report to officer.

C. Approach the patient in a calm, slow, reassuring and honest manner. Multiple people attempting to intervene may increase the patient's confusion and agitation.

D. Perform Broset Violence Assessment checklist (see below).

E. Consider offering alprazolam (Xanax) 0.25 mg or olanazapine (Zyprexa) ODT 10 mg for severe agitation or anxiety.

F. If severe agitation present and agitation poses harm to responders, bystanders or patient, and patient is not willing to take PO medications, administer sedation per Pharmacological Sedation Guidelines (see below)

G. Protect the patient, bystanders and rescuers from injury. Consider physical restraint and follow ***Physical Restraint 30.136*** protocol, if indicated.

H. Obtain history, physical and mental status examination.

I. Assess and treat any medical conditions per EMS protocol and then determine if patient is eligible for transport to UBHH.

J. All patients will be assessed and evaluated by EMS regardless of transport status.

Choice of Destination

A. Voluntary patient:
1. Hospital destination is determined by patient preference.
2. If the patient has no preference, transport to Unity Hospital or Portland Providence (See ***Unity Center for Behavioral Health Emergencies 30.190***).

B. Involuntary patient, patients on Directors Hold or Police Officer Mental Hold:
1. Patients of 9-1-1 incidents, transported by ambulance, must be evaluated at a licensed hospital Emergency Department.

Pharmacological Sedation Guidelines:

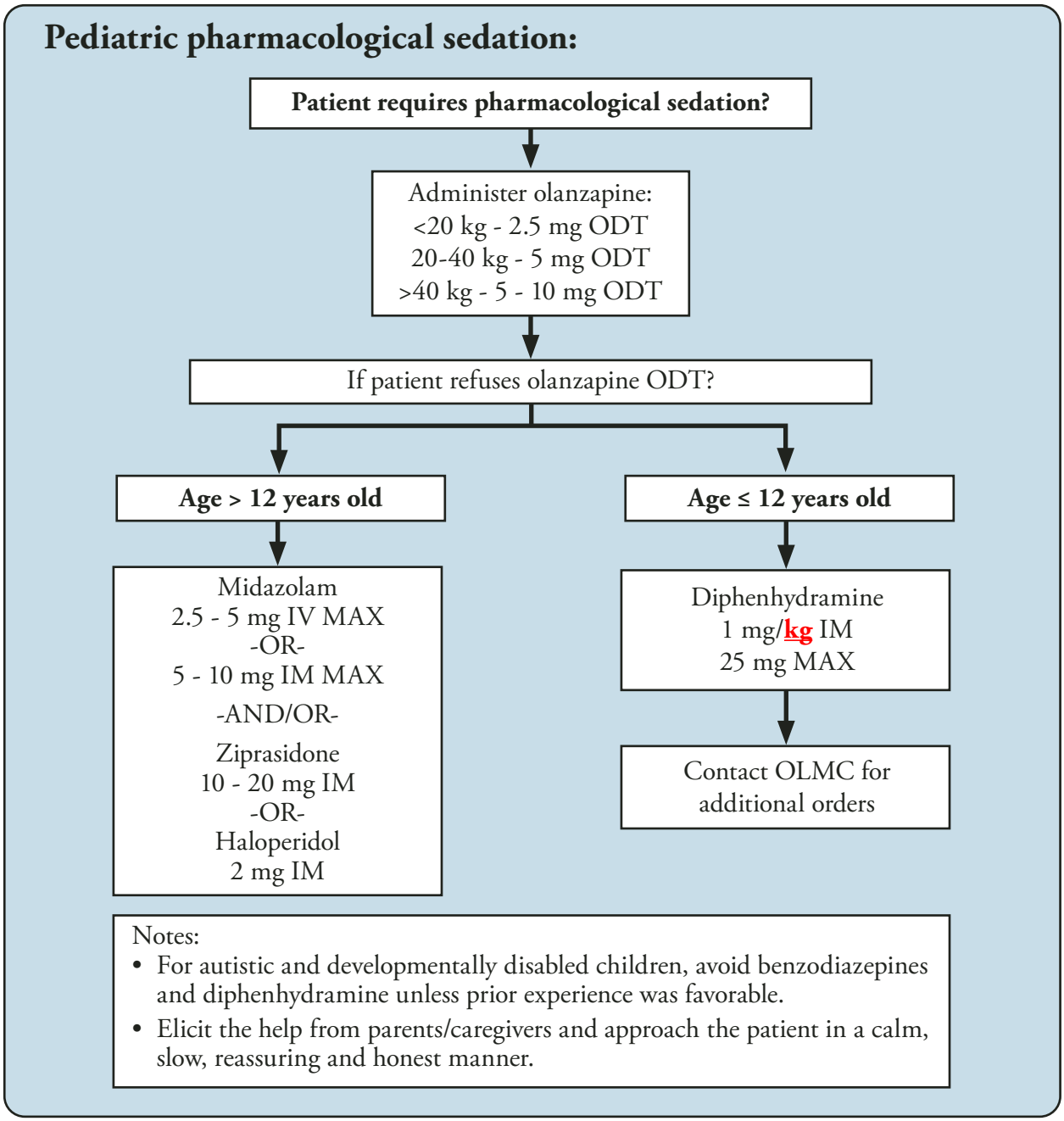
1. All patients who receive IV, IO, IM pharmacological sedation must be fully monitored (if possible) with cardiac monitor, SpO_2 and $EtCO_2$.
2. **If Broset is greater than 3 or verbal, physical threats or attacks on objects, then physical restraint procedure MUST be initiated unless sedated to RASS of +1 or less.** ***See Physical Restraint protocol 30.136***
3. Evaluate the patient's respiratory and cardiac status to ensure that no airway compromise exists. Monitor SpO_2 if possible.
4. DO NOT tighten chest straps to the point that they restrict breathing.

Pharmacological Sedation Treatment:

Obtain initial Richmond Agitation Sedation Score (RASS) (see below)

1. Evaluate the personnel needed to safely restrain the patient.
2. If RASS score is ≥+2, attempt to determine cause of agitation (i.e. drug or alcohol intoxication or withdrawal, medical or psychiatric problem) and consider oral benzodiazepine or oral antipsychotic.
3. If RASS score is ≥+3, patient is an immediate threat to responders, bystanders or patient:
   a. Administer midazolam (2.5-5 mg IV, IO or 5-10 mg IM/IN) PLUS ziprasidone (10-20 mg IM) or haloperidol (5-10 mg IV, IO, IM).
   b. Titrate midazolam 2.5-5 mg IV, IO or 5 mg IM/IN as needed every 5 minutes to control agitation.
4. Cause unknown or likely psychiatric:
   a. Administer ziprasidone (10-20 mg IM) or haloperidol (5-10 mg IV, IO, IM to a MAX dose of 10 mg). If initial dose of haloperidol has no effect after 10 minutes, repeat haloperidol (MAX dose of haloperidol is 10 mg IV, IO, IM).
   b. If 10 minutes after administration patient remains agitated, administer midazolam (2.5 mg IV/IO or 5mg IM/IN). May repeat once.
5. Cause likely drug ingestion (especially stimulants), withdrawal or postictal state:
   a. Administer midazolam (2.5-5 mg IV/IO or 5-10 mg IM/IN).
   b. If initial 2.5 mg IV or 5 mg IM/IN dose has no effect after 10 minutes, give an additional dose. (MAX dose is 5 mg IV/IO or 10 mg IM/IN).
   c. Consider and treat hypoxia, head injury or hypoglycemia.
   d. If 10 minutes after administration of the second dose, the patient remains combative, administer either ziprasidone or haloperidol as described above.
6. Assess vital signs within the first 5 minutes, if possible and thereafter as appropriate (at least every 10 minutes and before additional medication).
7. After administration of haloperidol, consider diphenhydramine 25 mg IV or IM if the patient shows signs of acute dystonic reaction. May repeat once.
8. Monitor patients ECG, obtain 12-lead and start IV, if possible.
9. Repeat RASS score every 10 minutes and at patient hand off to hospital. Goal is RASS score of 0 to -1.

Pediatric pharmacological sedation:



Precautions:

A. Haloperidol may cause postural hypotension, tachycardia, and acute dystonic reactions.

B. Ziprasidone or haloperidol may induce Torsades de Pointes in patients with history of prolonged QT or patients taking QT-prolonging drugs.

C. Ziprasidone or haloperidol is preferred for patients with known psychiatric disorders. Midazolam is preferred for patients who are known or suspected to be under the influence of stimulants or other intoxicants, who are in withdrawal, or who are postictal.

D. **Call OLMC for pediatric patients < 12 years old.**

Special Note

A. If ziprasidone (Geodon) is unavailable, use haloperidol per Drug Protocol 20.142.

B. Pediatric patients ≥ 12 years old may receive oral alprazolam (Xanax) 0.25 mg or olanazapine (Zyprexa) ODT 10 mg or parenteral midazolam or ziprasidone in the prescribed per above protocols

Broset Violence Assessment checklist

Score 0 = Low risk of violence

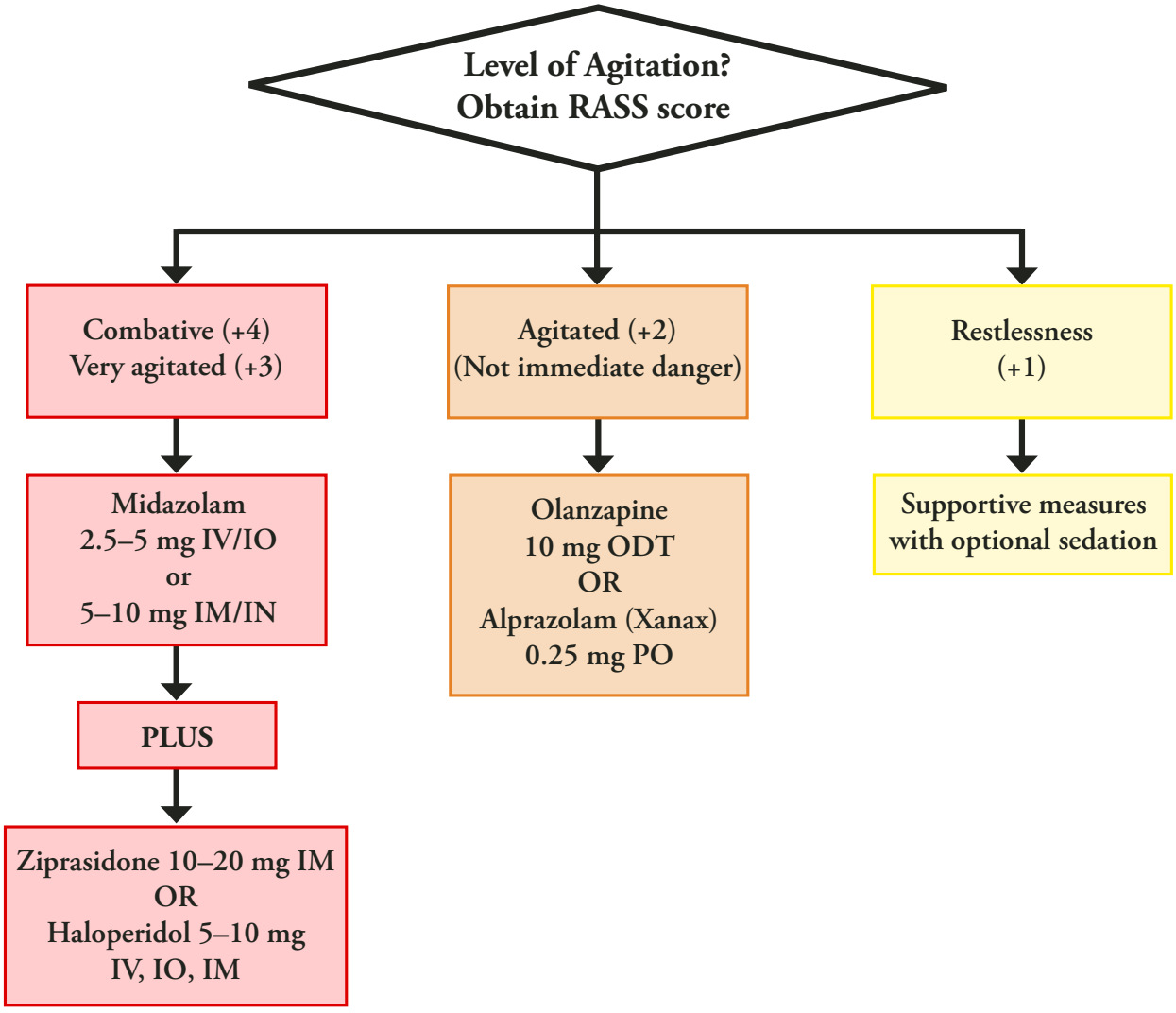
Score 1-2 = Moderate risk of violence
(preventative measures should be taken)

Score ≥ 3 = High risk of violence
(preventative measuresare required)

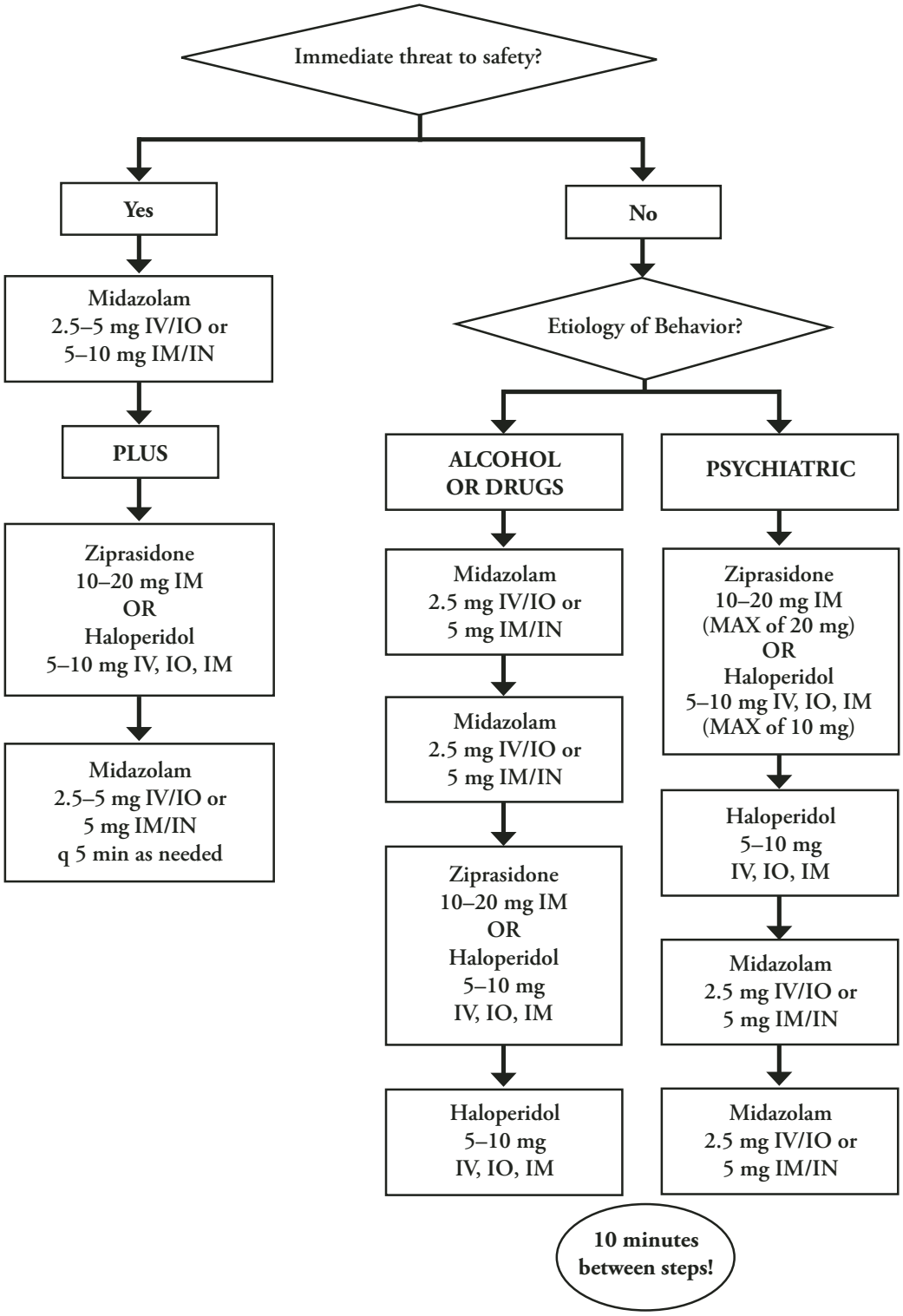
Attacks on objects	0 point 1 point
Physical Threats	0 point 1 point
Verbal Threats	0 point 1 point
Boisterousness	0 point 1 point
Irritability	0 point 1 point
Confusion	0 point 1 point

Richmond Agitation Sedation Scale (RASS)

Score	Term	Description
+4	Combative	Overtly combative and violent; immediate danger to EMS.
+3	Very agitated	Aggressive; verbally and physically uncooperative towards EMS.
+2	Agitated	Frequent non-purposeful movement; agitated when touched or moved.
+1	Restless	Anxious but movements not aggressive or dangerous to EMS or self.
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained awakening (eye opening/eye contact) to voice (> 10 seconds).
-2	Light Sedation	Briefly awakens with eye contact to voice (< 10 seconds).
-3	Moderate sedation	Movement or eye opening to voice (but no eye contact).
-4	Deep sedation	No response to voice but movement or eye opening to physical stimulation.
-5	Unarousable	No response to voice or physical stimulation.


Level of Agitation?
Obtain RASS score
Combative (+4)
Very agitated (+3)
Agitated (+2)
(Not immediate danger)
Restlessness
(+1)
Midazolam
2.5–5 mg IV/IO
or
5–10 mg IM/IN
PLUS
Ziprasidone 10–20 mg IM
OR
Haloperidol 5–10 mg
IV, IO, IM
Olanzapine
10 mg ODT
OR
Alprazolam (Xanax)
0.25 mg PO
Supportive measures
with optional sedation

Patient Restraint Flow Chart



Respiratory Distress

HX	PE	DDX
Recent illness Fever, chills Cough Chest pain PMH (Asthma/CHF/ COPD)	LOC Skin color Stridor Distended neck veins Breath sounds Peripheral edema	Upper airway obstruction Lung • Bronchitis • Asthma • COPD • Pneumonia • PE CHF/MI / Tamponade Trauma (pneumothorax / flail chest) Toxins (carbon monoxide, cyanide etc) Metabolic acidosis (diabetic ketoacidosis etc) Sepsis

Breath Sounds in Respiratory Distress

Characteristics	Possible Causes
Clear, symmetric	Hyperventilation, MI, metabolic, pulmonary embolus
Crackles, symmetric	Pulmonary edema, extensive pneumonia
Wheezing, symmetric	Asthma, pulmonary edema, COPD
Clear, asymmetric or absent	Pneumothorax, pulmonary embolus, COPD
Crackles, asymmetric	Pneumonia, pulmonary edema
Wheezing, asymmetric	Foreign body, pulmonary embolus, COPD
Stridor	Croup, epiglottitis, foreign body

Treatment:

A. Start O_2, follow ***Airway Management*** procedure, as indicated. Use pulse oximeter.
B. Start IV/IO as needed.
C. Monitor cardiac rhythm and follow ***Cardiac Dysrhythmia*** protocol.
D. Treat underlying cause as follows:
- **1.** Upper Airway (croup, epiglottitis, anaphylaxis, foreign body):
  - **a.** Obstructed airway procedures for complete obstruction.
  - **b.** Treat anaphylaxis per ***Anaphylaxis and Allergic Reaction*** protocol.
  - **c.** **Foreign body:** Remove using laryngoscopy if complete obstruction.
  - **d.** **Complete Obstruction:** If you cannot effectively ventilate the patient and they are deteriorating, consider cricothyrotomy.
- **2.** Respiratory Distress Unknown Etiology:
  - **a.** Consider nebulized albuterol (1 unit dose), may repeat as needed.
  - **b.** If a second and/or third treatment is needed, add ipratropium (1 unit dose) to albuterol treatment.
- **3.** Pulmonary Edema:
  - **a.** Sit patient upright.
  - **b.** If BP less than 100 mm/Hg: Treat possible cardiogenic shock. See ***Shock*** protocol.
  - **c.** If BP greater than 100 mm/Hg:
    - **i.** Nitroglycerine 0.4 mg SL (spray, tablet or powder), repeat nitroglycerine every 3-5 minutes.

NOTES:
Do not administer nitroglycerine without OLMC if patient has taken Viagra® or other similar drugs in the last 24 hours or Cialis® (tadalafil) within last 48 hours.

    - **ii.** If the patient remains in severe respiratory distress (e.g., unable to speak more than one or two words, low O_2 saturation [< 90 %], RR > 40) start CPAP if available.
    - **iii.** Consider albuterol 2.5 mg by nebulizer. May repeat as needed.
    - **iv.** Furosemide (if SBP > 100 mmHg and fluid overload state [JVD, rales, peripheral edema, hypertension]).
      - **a.** If patient is not currently taking furosemide, administer 20 mg IV/IO.
      - **b.** If patient is taking furosemide, administer 40 mg IV/IO.
  - **d.** If severe respiratory distress and patient not tolerating CPAP, administer IV/IO nitroglycerine 1 mg. May repeat once in 5 minutes.
    - **i.** If patient is tolerating CPAP but still with severe respiratory distress, continue CPAP and administer IV/IO nitroglycerine 1 mg. May repeat once in 5 min.

4. COPD / Asthma
   - **a.** DuoNeb (albuterol and ipratropium) by nebulizer. May repeat albuterol as needed.
   - **b.** If patient has severe respiratory distress administer dexamethasone (Decadron®) 10 mg IV, IO, IM, or PO.
   - **c.** If patient is deteriorating, administer 1:1,000 epinephrine 0.3 to 0.5 mg IM.
   - **d.** If patient condition does not improve, consider magnesium sulfate (2 grams over 20 minutes).
   - **e.** If clinically indicated, administer continuous nebulized albuterol treatment.
   - **f.** If the patient remains in moderate to severe respiratory distress (e.g., unable to speak more than one or two words, low O_2 saturation (< 90%), RR > 40) administer **CPAP** if available.

Asthma Severity Assessment:

ASTHMA SEVERITY ASSESSMENT GUIDE			
	MILD	**MODERATE**	**SEVERE**
Short of breath	Walking	Talking	At rest
Able to speak	In sentences	In phrases	In words
Heart rate	< 100	100 - 120	> 120
Respiratory rate	Elevated	Elevated	> 30
Lung sound	End expiratory wheezing	Full expiratory wheezes	Wheezes both phases
Accessory muscle use	Not usually	Common	Usually
Alertness	Possible agitated	Usually agitated	Usually agitated
$EtCO_2$	20 - 30	30 - 40	> 40

Pediatric Patients:

1. **Upper Airway Obstruction**
   - **a.** In patients 6 months to 6 years of age with audible stridor at rest, administer 1 mL epinephrine 1:1,000 diluted in 4 mL normal saline -or- racemic epinephrine 11.25 mg (0.5 mL) diluted in 2.5 mL normal saline, nebulized. May repeat once. Contact OLMC for additional dosing.
   - **b.** Suspected anaphylaxis or foreign body:
     - **i.** Treat anaphylaxis and foreign body obstruction per adult guidelines.
   - **c.** Suspected croup, epiglottis, or laryngeal edema:
     The usual cause of respiratory arrest in children with croup, epiglottitis or laryngeal edema is exhaustion, not complete obstruction.
     - **i.** If suspected croup, administer dexamethasone per peds guide.
     - **ii.** If the child deteriorates, perform BVM.
     - **iii.** If unable to ventilate with BVM, perform intubation.
     - **iv.** If intubation unsuccessful and unable to ventilate effectively, perform needle cricothyrotomy.
2. **Asthma**
   - **a.** Consider asthma in the following setting:
     - **i.** Prior history of wheezing.
     - **ii.** Patient's history of eczema and allergies
     - **iii.** Family history of asthma
     - **iv.** Home use of bronchodilator
   - **b.** Administer albuterol and ipratropium per adult guidelines.
   - **c.** If patient is deteriorating administer 1:1,000 epinephrine 0.01 mg/**kg** IM (MAX dose 0.5 mg). Contact OLMC for additional doses.
   - **d.** If patient has Moderate to Severe asthma based on *Asthma Severity Assessment Guide* and is not improving with treatment, consider dexamethasone 0.6 mg/**kg** IV/IO/IM/PO up to 10 mg.
   - **e.** If patient condition does not improve, consider magnesium sulfate (50 mg/**kg** over 20 minutes).
3. **Acute Bronchiolitis (< 2 years old)**
   Mild-moderate respiratory distress (see *Infant Respiratory Distress Guide* below)
   - **a.** Administer oxygen via blow-by, nasal cannula or mask to keep SpO_2 > 92%. Monitor $EtCO_2$ if available.
   - **b.** If nasal secretions and/or congestion, use nasal suction with adapter if available. If secretions are thick, may use normal saline to loosen.
   - **c.** If still wheezing, administer albuterol 2.5 mg via nebulizer. If improvement, may use every 10 minutes and follow asthma guidelines. Discontinue if patient's heart rate is >200.
   - **d.** If patient worsens and is still wheezing, consider alternative diagnosis such as asthma (croup if stridor). If suspected croup, administer epinephrine 1 mL of 1:1,000 diluted in 4 mL of normal saline via nebulizer.
     If improvement, may use every 10 minutes. Discontinue if patient's heart rate is > 200.
   - **e.** If unable to keep SpO_2 > 92% with oxygen or patient has continued significant work of breathing despite treatment:
     - **i.** 1 LPM/**kg** up to 15 LPM as starting setting (MAX at 2 LPM/kg or 20 LPM) by High Flow Nasal Cannula (pediatric) Oxygen (HFNCO).

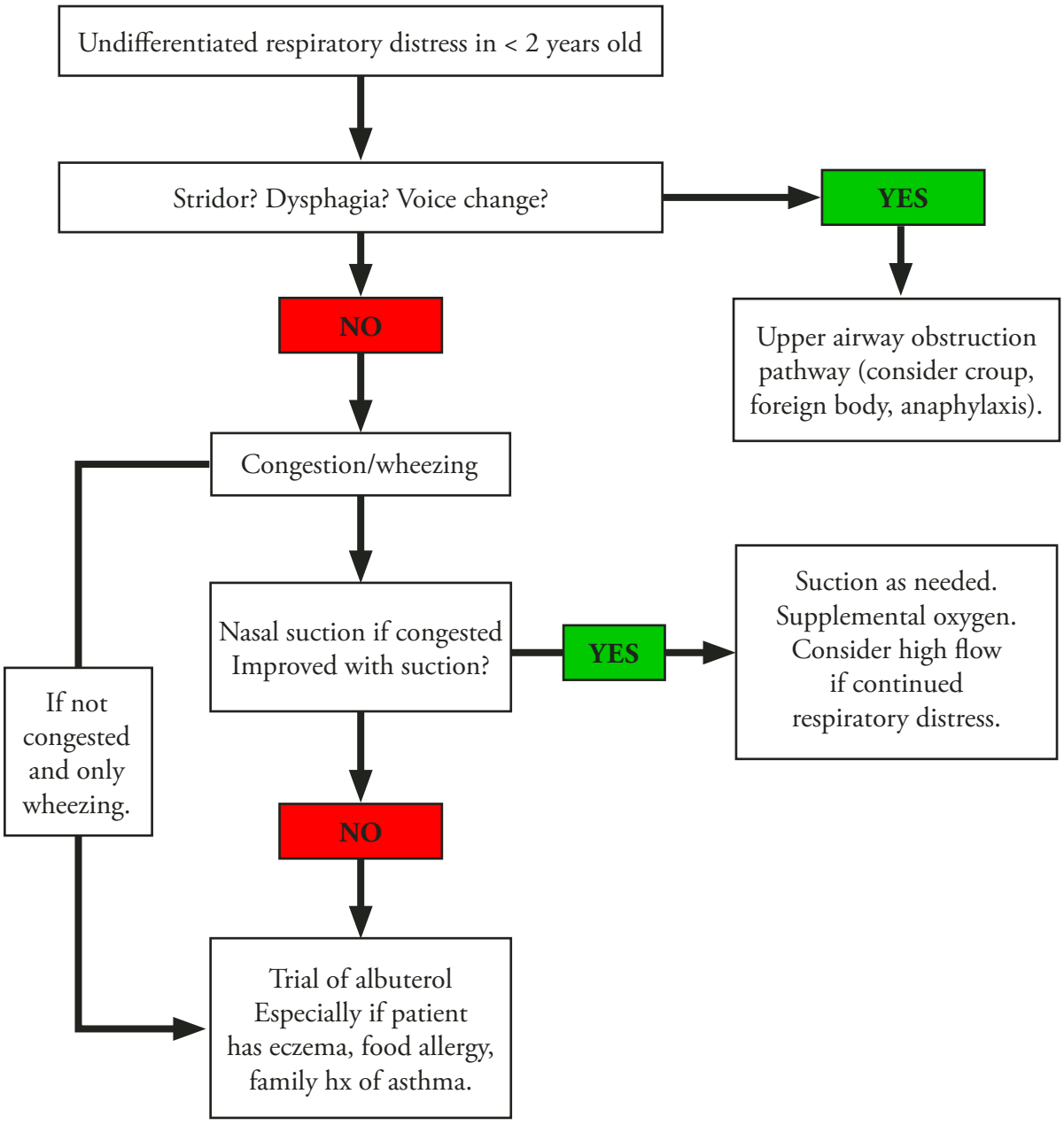
4. **Severe respiratory distress (see *Infant Respiratory Distress Assessment Guide* below)**
   - **a.** Suction nares as described above.
   - **b.** Initiate high flow nasal cannula oxygen as described above with $EtCO_2$ monitoring.
   - **c.** If wheezing, administer 1 mL epinephrine 1:1,000 diluted in 4 mL normal saline via nebulizer. If improvement may use every 10 minutes. Discontinue if patients heart rate is > 200."
   - **d.** Prepare for positive pressure ventilation with BVM and intubation for apnea, $EtCO_2$ > 55 or inability to maintain SpO_2 > 85%.
5. **BRUE (Brief Resolved Unexplained Event)**
   An episode that is frightening to the observer and is characterized by some combination of apnea, color change (cyanosis or pallor) change in muscle tone (flaccid or rigid), and choking or gagging.
   - **a.** BRUE is a group of symptoms, not a disease process.
   - **b.** BRUEs are most common in infants under one year of age, but may occur up to two years of age. They are more frequent in premature infants and infants with other health conditions such as cystic fibrosis, bronchiolitis and congenital heart disease.
   - **c.** Serious underlying causes can include pneumonia, bronchiolitis, seizure, sepsis, intracranial hemorrhage, and meningitis.
   - **d.** Many infants will have returned to normal by the time EMS arrives.
   - **e.** Consider non-accidental trauma.
   - **f.** Transport via ALS to an ED capable of treating critically ill infants even if the infant currently appears in no distress.

INFANT RESPIRATORY DISTRESS ASSESSMENT GUIDE			
	MILD	**MODERATE**	**SEVERE**
Respiratory Rate ≤ 2 months 2-12 months 1-2 years	 ≤ 60 ≤ 50 ≤ 40	 61-69 51-59 41-44	 ≥ 70 ≥ 60 ≥ 45
Retractions	Subcostal or intercostal	2 of: subcostal, intercostal, substernal retractions, OR nasal flaring	3 of: subcostal, intercostal, substernal, suprasternal, supraclavicular retractions, OR nasal flaring OR head bobbing
Dyspnea	1 of: difficulty feeding, decreased vocalization, or agitation	2 of: difficulty feeding, decreased vocalization, or agitation	Stops feeding, no vocalization OR drowsy and confused
Auscultation	End-expiratory wheeze only	Expiratory wheeze only	Inspiratory and expiratory wheezing OR diminished breath sounds OR both

Key Considerations:

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

Treatment of Acute Bronchiolitis (<2 years old)



Seizures

HX	PE	DDX
Seizure • Onset, duration • Type (grand mal, focal etc.) • Fever • Urine/fecal incontinence History • Diabetes • Head trauma • Pregnancy • Previous seizure • Current medications (including compliance) • Other (drug/ETOH, fever) • Toxic exposure	LOC O_2 saturation Active seizure (focal/ grand mal) Neuro deficits Evidence of trauma	Hypoxia Hypoglycemia Febrile Trauma CNS (CVA, meningitis, tumor) Drugs/OD Idiopathic ETOH withdrawal Electrolyte disturbance Cardiac arrest Eclampsia Shock

Treatment:

A. History of seizure with current altered mental status (postictal) or witnessed seizure.
1. Move hazardous objects away from patient and protect head; restrain only if necessary.
2. Start O_2; follow ***Airway Management*** procedure.
3. Place patient on left side for transport.
4. Continue assessment and document level of consciousness every 5 minutes.
5. Monitor cardiac rhythm and follow ***Cardiac Dysrhythmias*** protocol.

B. If patient is in status seizure (continuous seizure or repetitive seizures without regaining consciousness): Proceed as in "A" above, and do the following:
1. If no IV/IO access, administer midazolam 10 mg IM/IN. If seizure continues, may repeat in 3-5 minutes with an additional 10 mg midazolam IM/IN dose.
2. If still seizing, establish IV/IO access. Administer midazolam 5.0 mg IV/IO. If seizure continues, in 2-3 minutes administer 10 mg midazolam IV/IO. If still in status seizures, contact OLMC for possible midazolam infusion.
3. If IV/IO is immediately available, administer midazolam 2.5-5.0 mg IV/IO. If seizure continues, in 2-3 minutes administer 5-10 mg midazolam IV/IO. If still in status seizures, contact OLMC for possible midazolam infusion.

CAUTION: All of these dosages may cause apnea and hypoventilation in a large proportion of patients. Please apply oximeter, $EtCO_2$ and cardiac monitor when feasible.

4. Monitor patient's respiratory status closely after midazolam administration.
5. Check blood glucose and treat per ***Altered Mental Status and Coma*** protocol.

C. Transport may be unnecessary if the patient:
   1. Clears completely and is fully oriented within 20 minutes after arrival of EMS responders, and
   2. Is taking prescribed medications, and
   3. Has a physician, and
   4. Is experiencing the usual frequency of seizures.

D. If patient is not transported, have the patient (or guardian) sign an **Information Form** and document the patient's mental status (see ***Non-Transport*** procedure).

E. The patient should always be encouraged to contact a physician as soon as possible.

F. All first-time seizure patients require medical evaluation by a physician. Contact OLMC if patient refuses transport.

Pediatric Considerations:

1. If patient is in status seizure (continuous seizure or repetitive seizures without regaining consciousness):
   a. **If no IV/IO access**, administer midazolam 0.3 mg/**kg** IM/IN to a single MAX dose of 10 mg.
   b. If still seizing, in 3-5 minutes repeat midazolam using same IM/IN dose as above. If patient continues seizing in 3-5 minutes, establish IV/IO.
   c. Administer 0.1 mg/**kg** IV/IO (single MAX dose of 5 mg IV/IO). If patient continues seizing in 2-3 minutes, repeat using double the initial IV/IO dose (**single MAX dose of 10 mg on second dose**). If patient in recurrent seizure, consult OLMC and consider midazolam infusion.
   d. If IV/IO already established, administer 0.1 mg/**kg** IV/IO (single MAX dose of 5 mg IV/IO). If patient continues seizing in 2-3 minutes, repeat using double the initial IV/IO dose. If patient in recurrent seizure, consult OLMC and consider midazolam infusion.

CAUTION: All of these dosages may cause apnea and hypoventilation in a large proportion of patients. Please apply oximeter, $EtCO_2$ and cardiac monitor when feasible.

2. Febrile seizures is a seizure accompanied by a fever and are generally found between the ages of 6 months through 5 years of age. They are usually short in duration. Febrile seizures occur in 2-5% of all children and make up the most common convulsive event in children younger than 5 years. Simple febrile seizures are defined as primary generalized seizures that last for less than 15 minutes and do not recur within 24 hours. Complex febrile seizures are defined as focal, prolonged (15 minutes), and/or recurrent within 24 hours.

3. If, on arrival, the patient is not actively seizing (postictal) an IV is not required.

4. Check blood glucose and treat per ***Altered Mental Status and Coma*** protocol.

5. All hypoglycemic or first-time pediatric seizure patients should be transported.

6. If the seizure activity continues after the second midazolam dose (i.e. patient in status seizure), transport to nearest pediatric specialty hospital if less than 30 minutes away. If greater than 30 minutes, transport to nearest emergency department for additional seizure medications.

Specific Precautions:

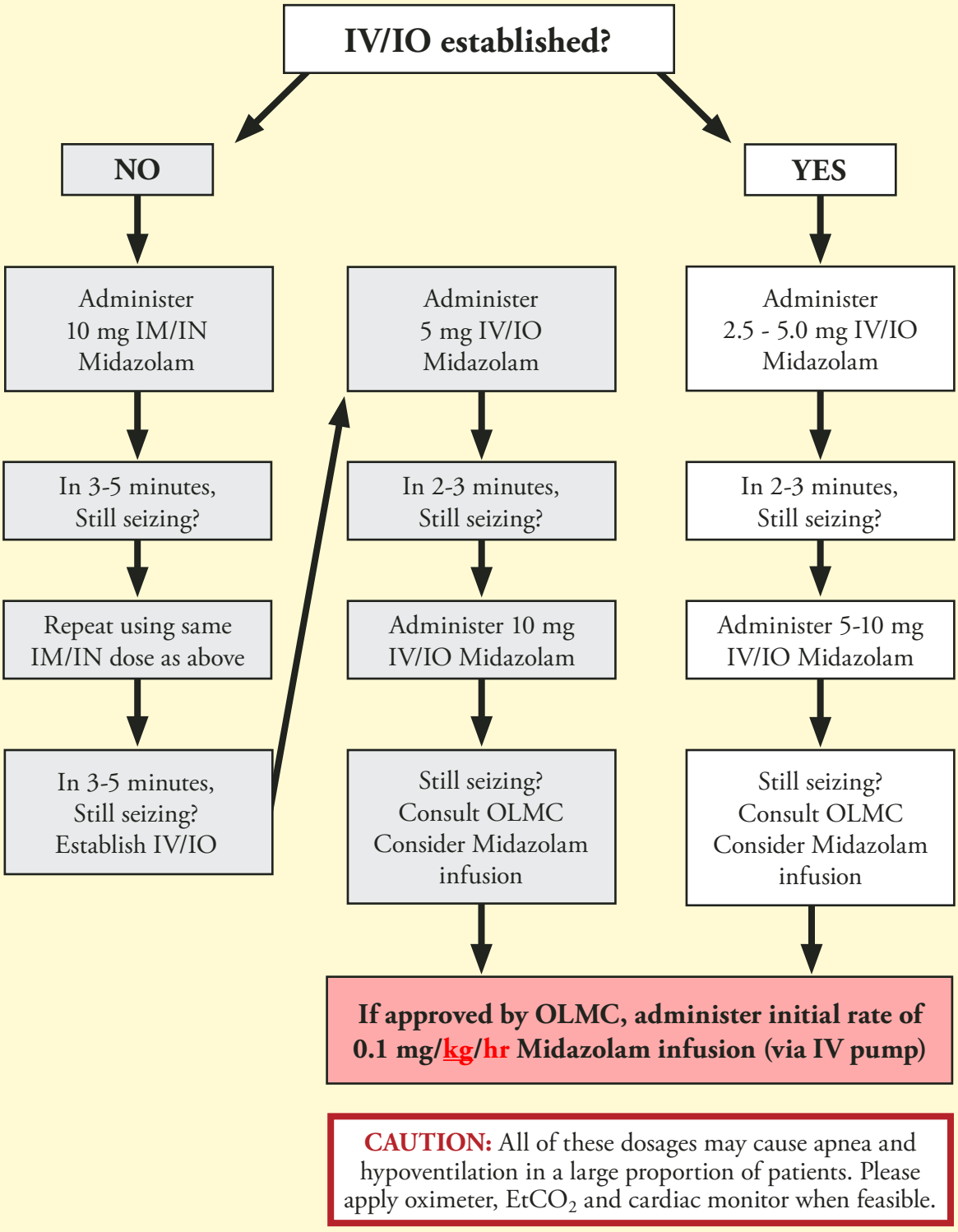
A. Remember to check for a pulse once a seizure terminates. Seizure activity may be the first sign of cerebral hypoxia or dysrhythmia.

B. New onset seizures in a pregnant woman, especially in the third trimester, may indicate toxemia of pregnancy that is life threatening to the mother and fetus.

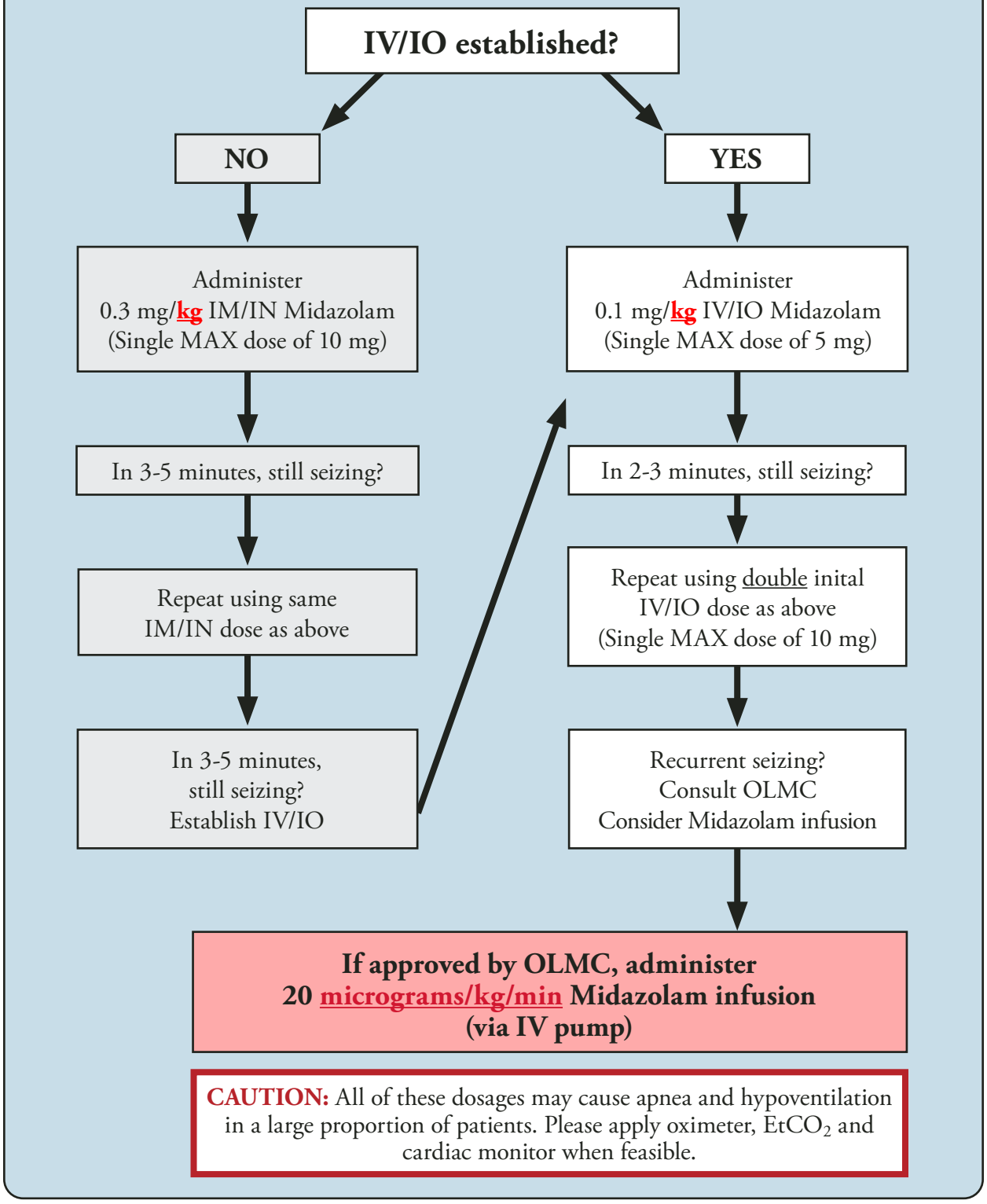
C. Avoid administering vecuronium or rocuronium to patient with status seizures as these may mask continuing seizure activity.

D. New onset seizures in any patient need medical evaluation.

Midazolam for Seizures (Adult)



Midazolam for Seizures (Pediatric)



Sepsis

HX	PE	DDX
Known or suspected infection Weak immune system Malnutrition Recent surgery Current indwelling catheter	Altered LOC Hypotension Hyperthermia Tachycardia Increased respiratory rate	Hypovolemia Cardiogenic shock Pulmonary embolus Anaphylaxis Adverse effect of medication Adrenal Insufficiency

Treatment:

A. Perform primary and secondary exam.
B. Monitor $EtCO_2$ and maintain SpO_2 above 95%.
C. Establish large bore vascular access, if possible
D. If MAP is >65 mmHg (SBP >90 mmHg) and septicemia is suspected, initiate 500-1000mL fluid bolus (10-20 ml/**kg** for pediatrics).
E. If MAP is <65 mmHg (SBP < 90 mmHg), treat per ***SHOCK*** protocol:
  1. Target is MAP > 65 mmHg
F. Check blood glucose.
G. Notify the receiving hospital with **"Sepsis Alert"** if **all** items below are present:
  1. Suspected infection
  +
  2. $EtCO_2$ is < 25mmHg
  AND
  3. Two or more SIRS criteria

Notes and Precautions:

A. Sepsis is a rapidly progressing, life threatening condition due to systemic infection. Sepsis must be recognized early and treated aggressively to prevent progression to shock and death.
B. The purpose of a "Sepsis Alert" is to provide pre-arrival emergency department notification in order to facilitate rapid assessment and treatment of a suspected severe sepsis patient.
C. For age appropriate pediatric vital signs, refer to Pediatric Guide.

Modified SIRS Criteria	
Physical Exam	**Score**
Temperature > 38 C or 100.4 F < 36 C or 98.6 F	1
Heart rate > 90/min	1
Respiratory rate > 20/min as confirmed by $EtCO_2$	1

Shock

HX	PE	DDX
Trauma	Fever	Hypovolemic
Hemorrhage (external / internal)	LOC	Cardiac
Chest pain / SOB	Capillary refill	Septic
Fever / sepsis	Skin appearance (rash, swelling, trauma)	Anaphylactic
Allergy / anaphylaxis	Neck veins	Obstructive (PE/pneumothorax/ pericardial tamponade)
Environmental (e.g. heat)	Lung sounds	Spinal
Dehydration	Abdominal tenderness	
	Pelvis	
	Extremity fracture	
	Neuro	

Treatment:

A. **Do not delay transport.**
B. Start O_2, follow ***Airway Management*** procedure.
C. Start IV/IO.
D. Determine type of shock and treat as follows:
- **1.** Hypovolemic Shock:
  - **a.** Control external bleeding with direct pressure, elevation, tourniquet, and/or hemostatic dressings.
  - **b.** Administer 250-500 mL fluid challenge to maintain a MAP > 65 mmHg (SBP > 90 mmHg).
    Repeat fluid boluses if continued signs of shock and no pulmonary edema.
  - **c.** For shock secondary to trauma or suspected AAA, do not over resuscitate. Goal is MAP 55-65 mmHg (SBP 70-90 mmHg) for trauma patients <u>without</u> head trauma. For patients <u>with isolated</u> head trauma, target MAP > 75 mmHg (SBP 110 mmHg)
  - **d.** Consider administration of whole blood, if available, if patient meets traumatic blunt or penetrating shock criteria.
- **2.** Cardiogenic Shock:
  - **a.** If suspected cardiac event follow ***Chest Pain*** protocol.
  - **b.** Monitor cardiac rhythm and follow ***Cardiac Dysrhythmia*** protocol.
  - **c.** Administer 250-500 mL fluid challenge to maintain a MAP > 65 mmHg (SBP of > 90 mmHg).
    Repeat once if continued signs of shock and no pulmonary edema.
    MAX of 1000 mL.

d. Consider push dose epinephrine until norepinephrine infusion is administered.
e. If MAP < 50 mmHg (SBP < 60 mmHg), administer norepinephrine infusion at 4 micrograms/min and titrate to effect. If no response, increase every 5 minutes in 4 micrograms/min increments to MAX of 24 micrograms/minute. Goal is a MAP > 65 mmHg (SBP > 90 mmHg).

3. Distributive Shock, including anaphylaxis, sepsis, and neurogenic shock.
a. If anaphylaxis is suspected, follow ***Anaphylaxis and Allergic Reaction*** protocol.
b. Administer 250-500 mL fluid challenge to maintain a MAP > 65 mmHg (SBP > 90 mmHg). Repeat fluid boluses if continued signs of shock and no pulmonary edema.
c. If MAP < 50 mmHg (SBP < 60 mmHg), administer norepinephrine infusion at 4 micrograms/minute. If no response, increase every 5 minutes in 4 micrograms/min increments to MAX of 24 micrograms/minute. Goal is a MAP > 65 mmHg (SBP > 90 mmHg) in medical patients.
d. Consider push dose epinephrine until norepinephrine infusion is administered.

4. Obstructive Shock, including suspected cardiac tamponade, tension pneumothorax, dissecting aneurysm, and massive pulmonary embolism.
a. Administer 250-500 mL fluid challenge to maintain a MAP > 65 mmHg (SBP > 90 mmHg). Repeat fluid boluses if continued signs of shock and no pulmonary edema.
b. Tension Pneumothorax — needle decompression.
c. If not responding to fluid administration **and** MAP < 50 mmHg (SBP < 60 mmHg), administer norepinephrine infusion at 4 micrograms/minute and titrate to effect. If no response, increase every 5 minutes in 4 micrograms/min increments to MAX of 24 micrograms/minute. Goal is a MAP > 65 mmHg (SBP > 90 mmHg) in medical patients.
d. Consider push dose epinephrine until norepinephrine infusion is administered.

Pediatric Considerations:

Treatment:

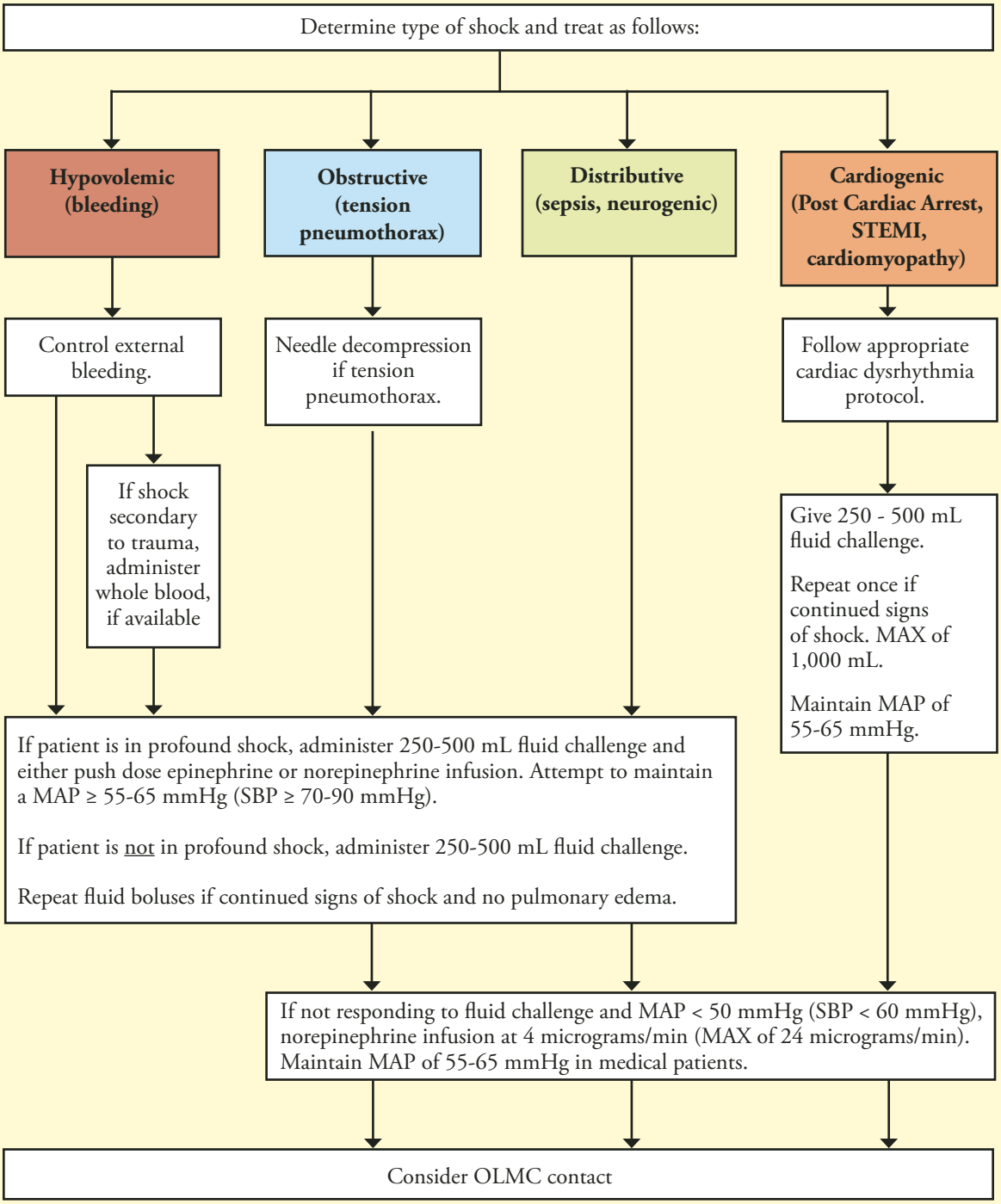
1. **Do not delay transport.**
2. Start O_2, follow ***Airway Management*** procedure.
3. Start IV/IO.
4. Determine type of shock and treat as follows:
   - **a.** Hypovolemic Shock:
     - **i.** Control external bleeding with direct pressure, elevation, tourniquet, and/or hemostatic dressings.
     - **ii.** Administer 20 mL/**kg** fluid challenge (10 mL/**kg** in neonates) to maintain age appropriate systolic pressure. Repeat twice if continued signs of shock and no pulmonary edema to a MAX of 60 mL/**kg** (30 mL/**kg** in neonates).
     - **iii.** Consider administration of whole blood, if available, if patient meets traumatic blunt or penetrating shock criteria.
   - **b.** Cardiogenic Shock:
     - **i.** If suspected cardiac event follow ***Chest Pain*** protocol.
     - **ii.** Monitor cardiac rhythm and follow ***Cardiac Dysrhythmia*** protocol.
     - **iii.** Administer 20 mL/**kg** fluid challenge (10 mL/**kg** in neonates) to maintain age appropriate systolic pressure. Repeat twice if continued signs of shock and no pulmonary edema to a MAX of 60 mL/**kg** (30 mL/**kg** in neonates).
     - **iv.** If blood pressure remains low administer norepinephrine infusion at 0.1 micrograms/**kg**/minute and titrate to effect. If no response in 5 minutes, increase to 0.2 micrograms/**kg**/minute. If still no response after 5 more minutes, may increase dose by 0.2 micrograms/**kg**/minute every 5 minutes to MAX of 1.2 micrograms/**kg**/min.
   - **c.** Distributive Shock, including anaphylaxis, sepsis, and neurogenic shock.
     - **i.** If anaphylaxis is suspected, follow ***Anaphylaxis and Allergic Reaction*** protocol.
     - **ii.** Administer 20 mL/**kg** fluid challenge to maintain age appropriate systolic pressure. Repeat twice if continued signs of shock and no pulmonary edema.
     - **iii.** If blood pressure remains low administer norepinephrine infusion at 0.1 micrograms/**kg**/minute and titrate to effect. If no response in 5 minutes, increase to 0.2 micrograms/**kg**/minute. If still no response after 5 more minutes, may increase dose by 0.2 micrograms/**kg**/minute every 5 minutes to MAX of 1.2 micrograms/**kg**/min.
   - **d.** Obstructive Shock, including suspected cardiac tamponade, tension pneumothorax, dissecting aneurysm, and massive pulmonary embolism.
     - **i.** Administer 20 mL/**kg** fluid challenge (10 mL/**kg** in neonates) to maintain age

appropriate systolic pressure. Repeat twice if continued signs of shock and no pulmonary edema to a MAX of 60 mL/**kg** (30 mL/**kg** in neonates).

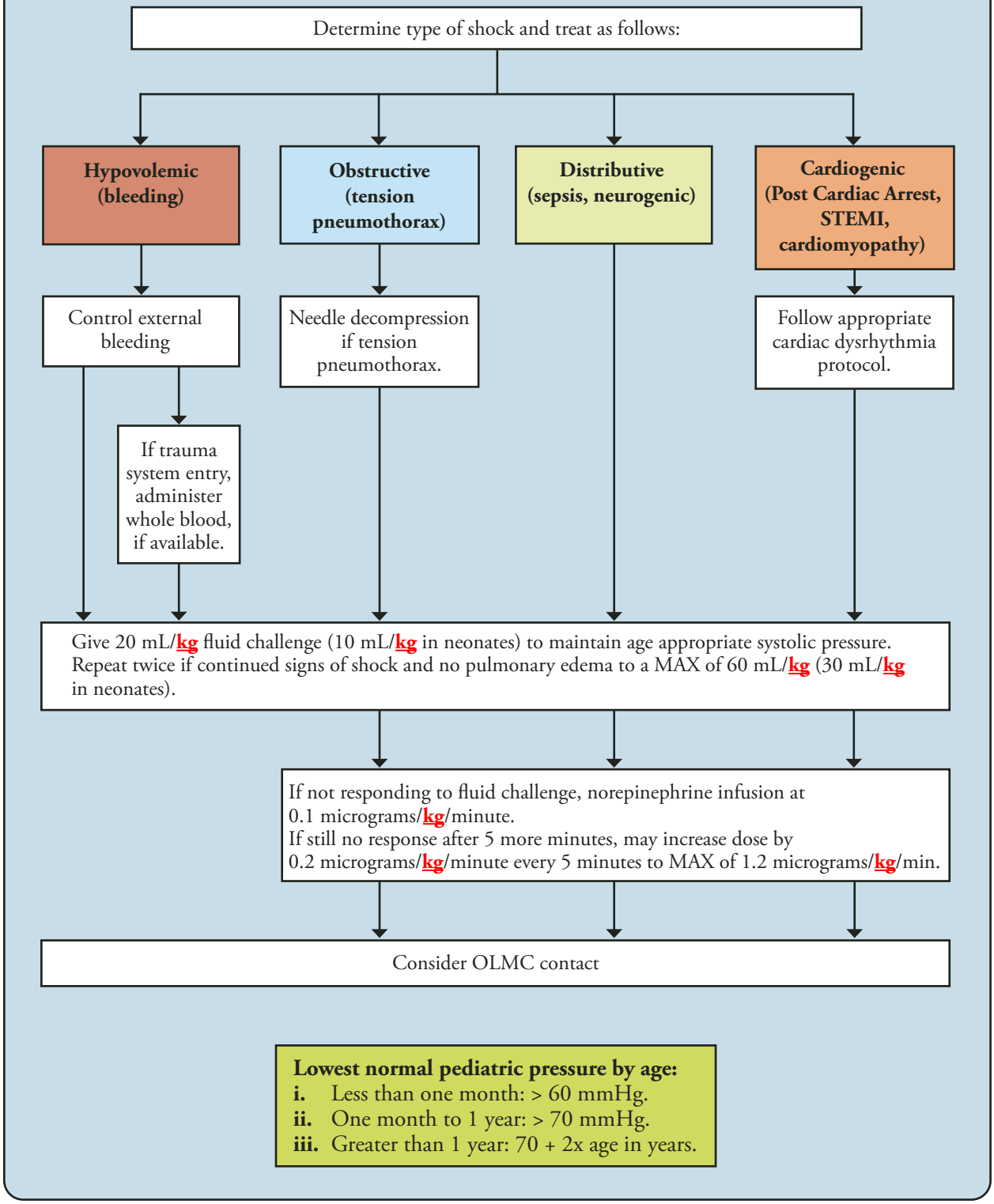
ii. Tension Pneumothorax — needle decompression.

iii. If obstructive shock and not responding to fluid administration administer norepinephrine infusion at 0.1 micrograms/**kg**/minute and titrate to effect. If no response in 5 minutes, increase to 0.2 micrograms/**kg**/minute. If still no response after 5 more minutes, may increase dose by 0.2 micrograms/**kg**/minute every 5 minutes to MAX of 1.2 micrograms/**kg**/min.

Shock (Adult)


Determine type of shock and treat as follows:
Hypovolemic (bleeding)
Obstructive (tension pneumothorax)
Distributive (sepsis, neurogenic)
Cardiogenic (Post Cardiac Arrest, STEMI, cardiomyopathy)
Control external bleeding.
Needle decompression if tension pneumothorax.
Follow appropriate cardiac dysrhythmia protocol.
If shock secondary to trauma, administer whole blood, if available
Give 250 - 500 mL fluid challenge.
Repeat once if continued signs of shock. MAX of 1,000 mL.
Maintain MAP of 55-65 mmHg.
If patient is in profound shock, administer 250-500 mL fluid challenge and either push dose epinephrine or norepinephrine infusion. Attempt to maintain a MAP ≥ 55-65 mmHg (SBP ≥ 70-90 mmHg).
If patient is not in profound shock, administer 250-500 mL fluid challenge.
Repeat fluid boluses if continued signs of shock and no pulmonary edema.
If not responding to fluid challenge and MAP < 50 mmHg (SBP < 60 mmHg), norepinephrine infusion at 4 micrograms/min (MAX of 24 micrograms/min). Maintain MAP of 55-65 mmHg in medical patients.
Consider OLMC contact

Shock (Pediatric)



Lowest normal pediatric pressure by age:

i. Less than one month: > 60 mmHg.
ii. One month to 1 year: > 70 mmHg.
iii. Greater than 1 year: 70 + 2x age in years.

Notes and Precautions:

A. For shock secondary to trauma or suspected AAA, do not over resuscitate.

B. Goal is MAP 55-65 mmHg (SBP 70-90 mmHg) for trauma patients without head trauma. For patients with isolated head trauma, target MAP > 75 mmHg (SBP 110 mmHg).

C. Closely monitor patient's respiratory status and vital signs. Avoid fluid overload.

D. For sepsis, neurogenic, and cardiogenic shock, goal is to maintain MAP > 65 mmHg (SBP > 90 mmHg).

E. For patients in shock with known or suspected adrenal insufficiency, consider administration of dexamethasone (10 mg adults or 0.6 mg/~~kg~~ pediatrics) in addition to fluids and/or norepinephrine.

F. If an improvised tourniquet is present before medical provider arrival, place a commercial tourniquet per protocol and remove improvised tourniquet if operationally feasible.

Key Considerations:

A. Mechanism of injury, medications, recent illness, medical history.

Stroke/CVA

HX	PE	DDX
Time last known normal (LKN) New onset of the following: weakness, speech, inability to walk, coordination, double vision or vision loss History of A-Fib Trauma or surgery in last 3 months Recent seizure Medications (Coumadin, Heparin DOAC medications, antiplatelet, aspirin) GI Bleeding Previous stroke / TIA Diabetes Hypertension	LOC Cardiac rhythm Signs of trauma Pupils Neuro exam (see stroke scale) Vital signs	Hypo/Hyperglycemia Drugs /OD CVA TIA Trauma Seizure (postictal) Hypo/Hyperthermia

Treatment:

A. Start Oxygen per ***Airway Management*** protocol.
B. Monitor vital signs and oxygen saturation.
C. If feasible, apply cardiac monitor and continuously assess rhythm.
D. Check CBG and treat per ***Altered Mental Status and Coma*** protocol.
E. Complete **BEFAST Stroke Screen**.
F. If BEFAST is positive, perform C-STAT evaluation.
G. If BEFAST is negative, consider differential diagnosis.
H. If BEFAST and C-STAT is positive, transport to nearest Interventional Stroke Center and notify ED of inbound Stroke Alert.
I. If BEFAST is positive and C-STAT is negative, transport to nearest stroke center and notify ED of inbound Stroke Alert.
J. Establish IV access 18 gauge or larger (in proximal site if possible).
K. For all stroke alerts or stroke concerns, perform 12-lead ECG, if feasible.
L. Transport patient in supine position, if tolerated. (E.g.: respiratory distress)
M. Document serial neurologic examinations as well as last known well (LKW).

BEFAST Stroke Screen (All findings should be new onset)		
BALANCE	**Yes**	**No**
Finger to nose abnormal		
Truncal ataxia		
Ataxic gait present		
EYES	**Yes**	**No**
Double vision or loss of vision in one or both eyes		
Unable to move eyes all the way from both side to side (extraocular movement)		
FACE	**Yes**	**No**
Inability or asymmetry to "puff out cheeks"		
Unable to smile or show their teeth		
ARM/LEGS	**Yes**	**No**
Unable to raise and extend both arms with palms up for 10 seconds		
Unable to raise one leg at a time for ≥5 seconds		
Unequal sensation in extremities		
SPEECH	**Yes**	**No**
Slurred speech, trouble finding words, unintelligible words		
Unable to follow simple commands		
Unable to recognize common objects		
TIME	**Yes**	**No**
What time was the last known well (LKN)?	TIME:	
***** BEFAST Stroke Screen is considered positive if YES for any of the above *****		

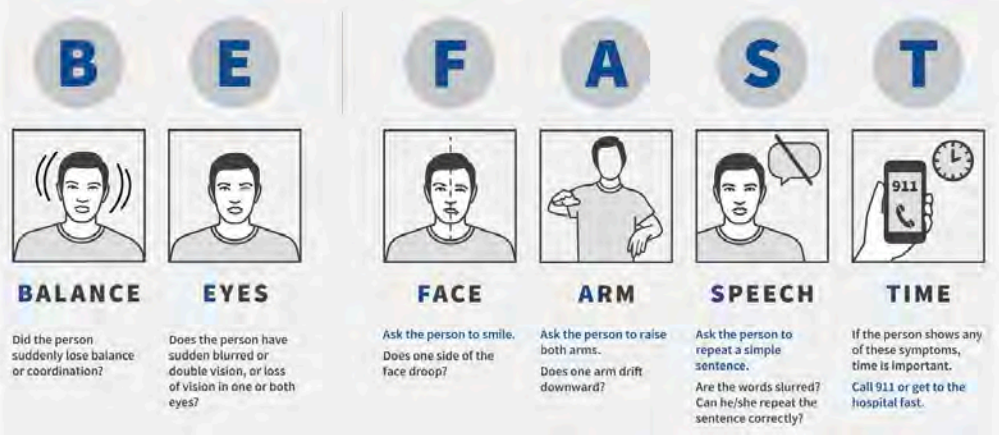
Specific Notes:

A. Do not treat hypertension or administer aspirin.

B. Acute stroke interventions include thrombolytics (TPA) which can be administered up to 4.5 hours from LKN and interventional radiology for thrombectomy up to 24 hoursafter LKN.

C. DOAC medications are defined as medications dabigatran (Pradaxa), rivaroxaban (Xarelto), apixaban (Eliquis), edoxaban (Savaysa), and betrixaban (Bevyxxa).

D. Antiplatet medications are defined as asiprin, clopidogrel (Plavix), prasugrel (Effient), ticagrelor (Brilinta).

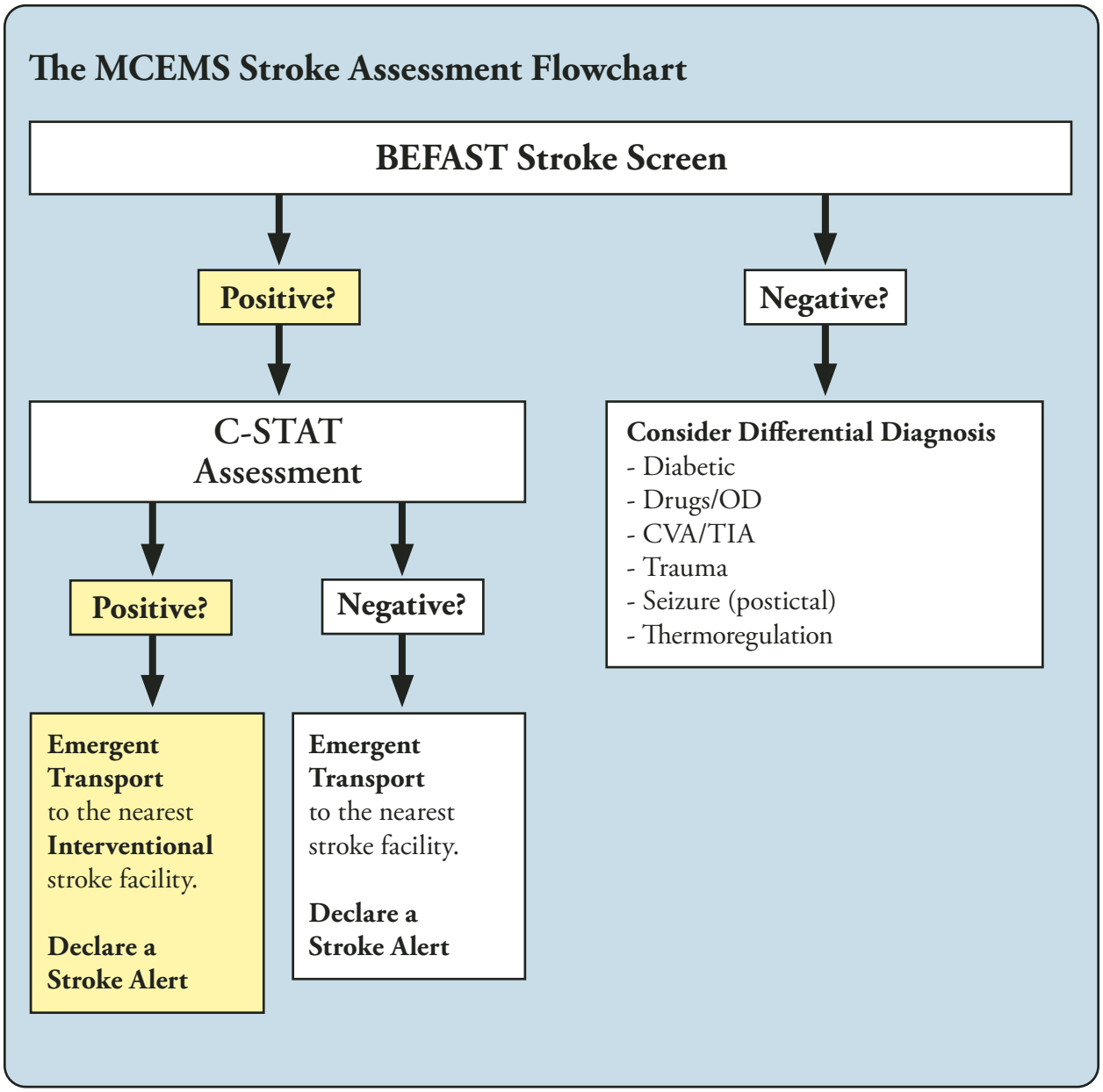


C-STAT – CINCINNATI STROKE TRIAGE ASSESSMENT TOOL		
	POINTS	**DEFINITION**
GAZE		Condition where both eyes move differently to each other.
Absent Present	0 2	
ARM WEAKNESS		Cannot hold up arm(s) for 10 seconds.
Absent Present	0 1	
LEVEL OF CONSCIOUSNESS		Incorrectly answers at least one of two LOC questions AND does not follow at least one of two commands.
Absent Present	0 1	
****** C-STAT positive is defined as a score ≥ 2 ******		
If BEFAST and C-STAT is positive, transport to nearest Interventional Stroke Center		

Interventional Capable Centers:

1. Emanuel
2. OHSU
3. Providence Portland
4. St. Vincent's Medical Center
5. Sunnyside Kaiser
6. Southwest Washington Medical Center

The MCEMS Stroke Assessment Flowchart



Submerged Patient

HX	PE	DDX
Events leading to submersion: • MVA • jumping off bridge • swimming • seizure • diving accident Duration of submersion Estimated water temperature at recovery depth	Mental status Oxygenation Estimated core temperature Skin appearance Lung sounds Neurological exam ECG	Trauma (cervical spine) Hypoxia Hypotension Hypothermia Aspiration pneumonia

Treatment:

A. Start O_2, follow ***Airway Management*** procedure**.**
B. Take spinal precautions and consider Trauma System entry.
C. Treat per ***Hypothermia*** protocol, if indicated.
D. Consider IV/IO as needed.
E. Monitor cardiac rhythm and follow ***Cardiac Arrest*** and/or ***Cardiac Dysrhythmia*** protocol, ***except:***
Do not resuscitate patients in cardiac arrest if submerged for more than 30 minutes, with the following exceptions:
Resuscitation may be initiated if the patient is recovered within 60 minutes, if:
1. Child less than 6 years, and water temperature less than 40° F at recovery depth.
2. Patient may have been trapped in an underwater air pocket.
3. Water is less than 40° F at recovery depth and information suggests patient may have been swimming on the surface for at least 15 minutes before becoming submerged.
4. Paramedic discretion, contact OLMC.

Trauma Patient Evaluation and Treatment

HX	PE	DDX
Mechanism of injury Description of scene Initial presentation Loss of consciousness Location of identified injuries	Vital signs GCS Identified injuries or abnormalities	Interventions Control of bleeding Airway Breathing Circulation (IV access) Immobilization Analgesia

Treatment:

Treatment priority should be approached in this order:

- **A.** Control exsanguinating hemorrhage.
- **B.** Airway maintenance (including control of the cervical spine). If unable to establish and maintain an adequate airway, the patient should be transported to the nearest acute care facility to obtain definitive airway control.
- **C.** Breathing.
- **D.** Control of circulation.
- **E.** Treatment of shock.
- **F.** Splinting of fractures.
- **G.** Neurological examinations.
- **H.** Detailed patient assessment.

Procedure:

A. Bleeding Control
1. Identify hemorrhage:
   - **a.** Apply direct pressure, or indirect pressure.
   - **b.** Apply tourniquet if bleeding from an extremity is not controlled by direct pressure, or indirect pressure.
   - **c.** If bleeding persists or if unable to apply tourniquet apply external clotting agent.
   - **d.** If hemorrhage in femoral or axillary regions continues in spite of tourniquets/external clotting agents, apply and maintain continuous direct pressure or deploy junctional tourniquets or XSTAT if available.
   - **e.** If hemorrhage in neck region, apply external clotting agents and direct pressure.

B. Assess and Maintain Airway - Protect Cervical Spine
1. Support respirations per ***Airway Management*** procedure.
2. When feasible, intubate if GCS < 8.
3. Ventilate patient to maintain $EtCO_2$ between 35-40 mmHg. If patient exhibits signs of herniation, ventilate to maintain $EtCO_2$ between 30-35 mmHg.
4. Maintain oxygen saturation > 90%.

C. Breathing
- **1.** Seal open pneumothorax.
- **2.** Start O_2, follow Airway Management procedure.
- **3.** Decompress suspected tension pneumothorax(s) in patients with severe respiratory distress or shock.
- **4.** Perform bilateral chest decompression in patients with witnessed trauma arrest.

D. Circulatory Control
- **1.** Initiate two (2) large bore IVs or humeral IO with Lactated Ringer's or Normal Saline during transport.
- **2.** Target Vital Signs
  - **a.** Maintain MAP > 75 mmHg (SBP > 110 mmHg) in patients with isolated head injury.
  - **b.** Maintain MAP 55-65 mmHg (SBP 70-90 mmHg) in patients with suspected thoracic, abdominal, or pelvic hemorrhage.

Target Vital Signs for Circulatory Support

	Isolated moderate to severe Head Injury (GCS 3-12) -AND/OR- Isolated Spinal Injury	**Trauma without Head Injury**	**Multi-system Trauma with or without Head Injury (GCS 3-12) or Spinal Injury**
MAP	**>75 mmHg**	***55-65 mmHg***	***>65 mmHg***
SBP	>110 mmHg	70-90 mmHg	>90 mmHg

E. Medication Treatment
- **1.** Administer Tranexamic Acid (TXA) 2 grams slow IV/IO push as soon as feasible if patient meets moderate to severe head and/or traumatic hemorrhagic shock criteria.

TXA	**Isolated Head Injury**	**Traumatic shock without head injury**	**Multi-system trauma with traumatic shock meeting ANY of the following:**
	2 gm TXA if GCS 3-12 with a reactive pupil	2 gm TXA if MAP <55 mmHg or SBP <70 mmHg	2 gm TXA 1. GCS 3-12 with a reactive pupil with MAP <55 mmHg or SBP <70 mmHg 2. MAP <55 mmHg or SBP <70 mmHg

- **2.** Administer whole blood, if available, if patient meets traumatic shock criteria.

F. If suspected pelvic fracture with mechanical or hemodynamic instability, apply pelvic splint or pelvic immobilization device.
- **1.** Perform pelvic stability assessment prior to immobilization with spider straps.

G. Summary of TXA indications.

Inclusion Criteria	Exclusion Criteria
- Adult ≥15 years old - ≥ 50 kg if age unknown - Blunt or penetrating injury - ≤ 1 hour from of injury - IV/IO established **Physiological criteria:** - GCS between 3 - 12 with a reactive pupil -AND/OR- - MAP < 55 mmHg (SBP < 70 mmHg)	- GCS = 3 with no reactive pupil - >1 hour from time of injury or time unknown - Any chest compressions (manual or mechanical) - Seizures, MI, Stroke, or Dialysis (head injury only) - Drowning - Hanging

H. Perform fracture immobilization per protocol.

1. For isolated penetrating head, neck, or torso trauma, immobilization of the cervical spine is unnecessary unless there is overt neurologic deficit or an adequate physical examination cannot be performed, e.g., a patient with altered mental status or a patient with distracting injury.

I. Prevent hypothermia.

1. Cover patient with appropriate blanket to maintain body heat.

Note:

- In a situation where the mechanism of injury appears inconsistent with the patient's and not severe enough to induce traumatic arrest, consider a primary medical cause for the patient's cardiac arrest.
- Traumatic arrest is approached in a distinct fashion from medical cardiac arrest. TXA is not indicated for non-viable patients due to traumatic arrest.
- DO NOT allow chest compressions to interfere with addressing the reversible causes of the arrest (such as needle decompression).
- If a patient deteriorates to cardiac arrest during transport, perform CPR and notify the trauma facility.
- Consider early transport for patients with pregnancy > 22 weeks. Notify receiving hospital that patient is pregnant.
- If an improvised tourniquet is present before medical provider arrival, place a commercial tourniquet per protocol and remove improvised tourniquet if operationally feasible.
- Suspected isolated spinal cord injury (i.e. Neurogenic Shock - injury to spinal cord alone with motor loss and hypotension) should be treated with vasopressors rather than volume and/or TXA. (Ex: diving injury with suspected cervical spine injury).
- Isolated falls from standing most frequently results in head injury and not hemorrhagic shock.
- Multi-system trauma is defined as trauma to multiple areas of the body including the head, neck, spine, chest, abdomen and major extremity trauma.
- Do not administer ketorolac to trauma system entry patients