

LMHS Protocols



Affiliate of ProMedica



Different fields...Same Goal!

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Preface

Signature Page

Signature Page

The preceding protocols are approved as listed.

3-29-2023

Effective Date



Todd Brookens, DO, FACEP, FAAEM
EMS Medical Director
Lima Memorial Health System



Doug LaRue
DOUG LARUE
Notary Public, State of Ohio
My Commission Expires
3-11-2024

Response EMS Protocols

2

Response EMS Protocols

2

Letter From Medical Director

Introduction:

You have in your hands (or on your computer screen) the protocol document which describes the methods whereby Fire Departments and EMS Units operating under the medical direction of Lima Memorial Health System will provide high quality pre-hospital medical care. The document is exhaustive; however, we are not able to write a protocol or policy for every situation you may encounter in the pre-hospital environment and as such, they provide a guideline for treating the majority of situations presented to you. Additionally, On-Line Medical Control is always available for your consultation.

Foundations:

Definition of a Patient:

A patient is an individual requesting or potentially needing medical evaluation or treatment. A patient-provider relationship is established via telephone, radio, or personal contact. It is your responsibility to ensure all potential patients are offered the opportunity for evaluation, treatment, and/or transport.

Rights of a Patient:

Once you have begun collecting information about a patient encounter, you have an ethical obligation to protect a patient's confidential information. It is important to take every opportunity to protect patient confidentiality. This applies to written as well as spoken communications.

Competent patients have the right to accept or refuse medical care, even if the consequences of the refusal of care may potentially be harmful for the patient. In the event that a patient refuses care, it is important to remember the following:

- 1) Be courteous
- 2) Offer transport without some or all of the recommended treatment if the patient will allow that.
Document the patient's wishes
- 3) Clearly advise the patient of the possible complications of their decision
- 4) Advise the patient to call 911 if they subsequently desire treatment and transport
- 5) Accurately document all components of the patient encounter

Regarding CONSENT:

1) Minors:

- a) Patients under the age of 18 may not consent to medical treatment or transport.
However, the following may consent for the treatment of a minor
 - i) Mother or Father
 - ii) Legal Guardian
 - iii) An individual standing in *loco parentis*. Such persons may include a stepparent taking the responsibilities of a parent of the child.
 - iv) The leader of a group of children in possession of written permission from the parent authorizing emergency medical treatment (i.e. a school field trip, etc)

- b) No consent required in the following circumstances prior to initiating treatment:
 - i) The patient, guardian, or person standing in *loco parentis* cannot be reached and the minor needs to receive medical treatment.
 - ii) The identity of the child is unknown and a delay in giving treatment would endanger the life of the child.
 - iii) The effort to contact the child's parents, guardian, or person standing in *loco parentis* would result in a delay that would seriously worsen the condition of the child.
- c) A minor may consent to treatment without the knowledge of a parent in the following circumstances:
 - i) Pregnancy
 - ii) Treatment of STD's
 - iii) Alcohol or drug abuse
 - iv) Emotional disturbance

2) Life threatening situations without the ability to communicate:

- a) A patient of any age who is unable to communicate because of an injury, accident, illness, or unconsciousness and is suffering from what reasonably appears to be a life-threatening injury or illness should be treated under the principle of ***implied consent***.
- b) The principle of implied consent presumes that if the individual with the illness or injury were able to communicate, he or she would consent to the emergency treatment.
- c) In these situations, patients may be transported without their consent. Law enforcement, physical and/or chemical restraint may be required.

3) Potentially life-threatening situations:

- a) Patients usually present in one of two situations: the alert patient who has a concerning presentation and refuses treatment and/or transport or the patient is intoxicated but does not have what reasonably appears to be a life-threatening injury. In these situations, the following steps should be taken:
 - i) Determine orientation to person, place, and time. Document.
 - ii) Determine what factor(s) is/are influencing the patient to refuse medical care. Resolve those in your power (i.e. transport without an IV).
 - iii) Attempt communication with spouse/significant other or family members.
 - iv) If patient continues to refuse, consider On-Line Medical Control or contact the medical director.
 - v) If patient continues to refuse care, clearly explain risks of refusal and have patient repeat those to you. Document.
 - vi) Assure patient they can call back for treatment and transport at any time.

Automatic notification of the Medical Director

Events that may potentially have a negative impact on patient care must be reported to the Medical Director immediately. Notification may be made by directly contacting the Medical Director at (419) 346-9444. These events include the following:

- 1) Cardiac arrest or respiratory arrest after administrations of any sedative or analgesic
- 2) Cardiac arrest after administering an anti-arrhythmic agent in a previously stable patient
- 3) Any attempt at surgical airway
- 4) Incorrect medication administration with patient complication
- 5) Any cardiac or respiratory arrest or patient injury related to use of physical or chemical restraints
- 6) Provider operating outside of scope of practice as defined by the State of Ohio and by the provider's approved level of practice within the system
- 7) Needle decompression of the chest
- 8) Intubation attempts >3
- 9) Unrecognized esophageal intubation or complication related to advanced airway management

Disclaimer: Certain medications and/or medical devices listed in the LMHS EMS protocols may not be available to or used by all departments utilizing LMHS medical direction due to financial considerations/limitations and/or certification level or training.

These policies, procedures, and protocols provide a foundation for providing the best possible patient care to those we encounter in the pre-hospital environment. The way we conduct ourselves in a professional manner is as important as the care we render to the citizens we serve.
I am happy to provide medical direction to your agency.

Sincerely,
Todd Brookens, DO, FACEP
Medical Director
Lima Memorial Health System
Emergency Medical Services

Scope of Practice

Title	Color
General	
EMR	
EMT	
AEMT	
Paramedic	
Medical Control	

Global Changes and/or Individual Page Removals

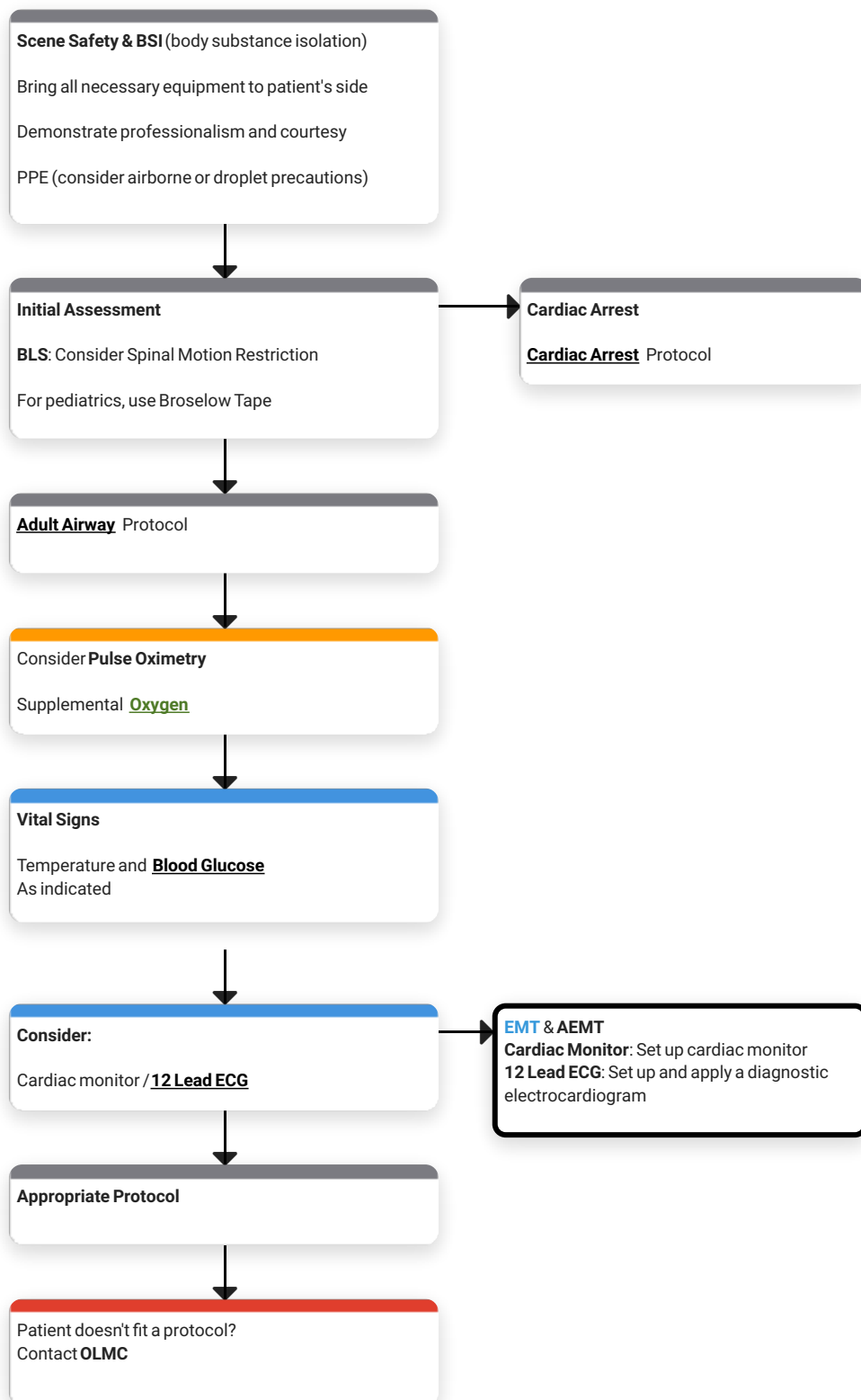
Pediatric RSI Procedure: Page removed

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Adult Section

Adult Assessment

Universal Patient Care

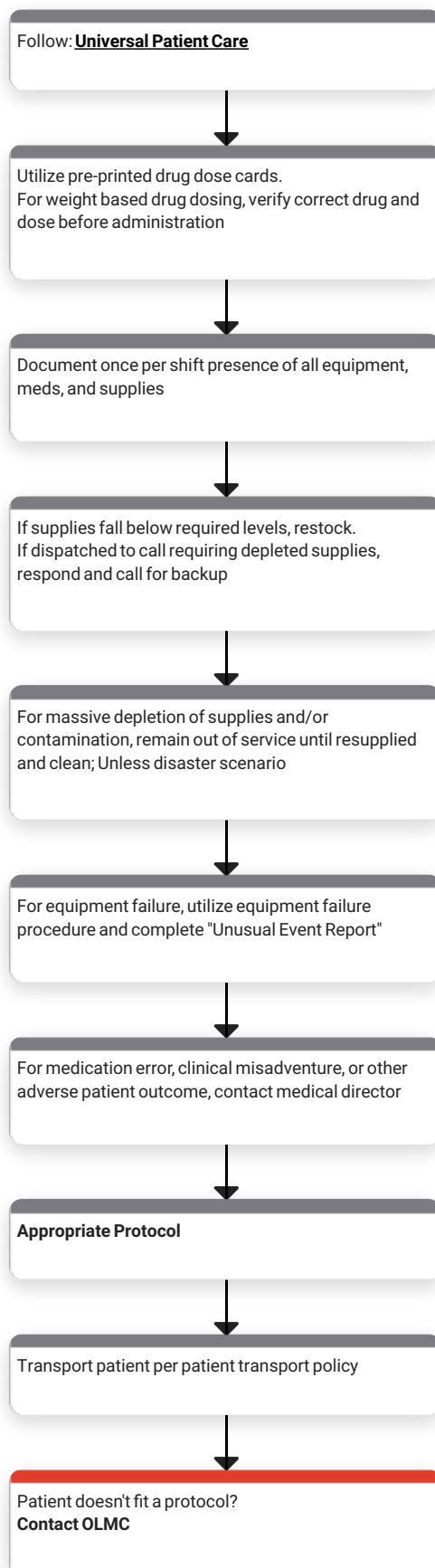


Universal Patient Care - Medical Reference

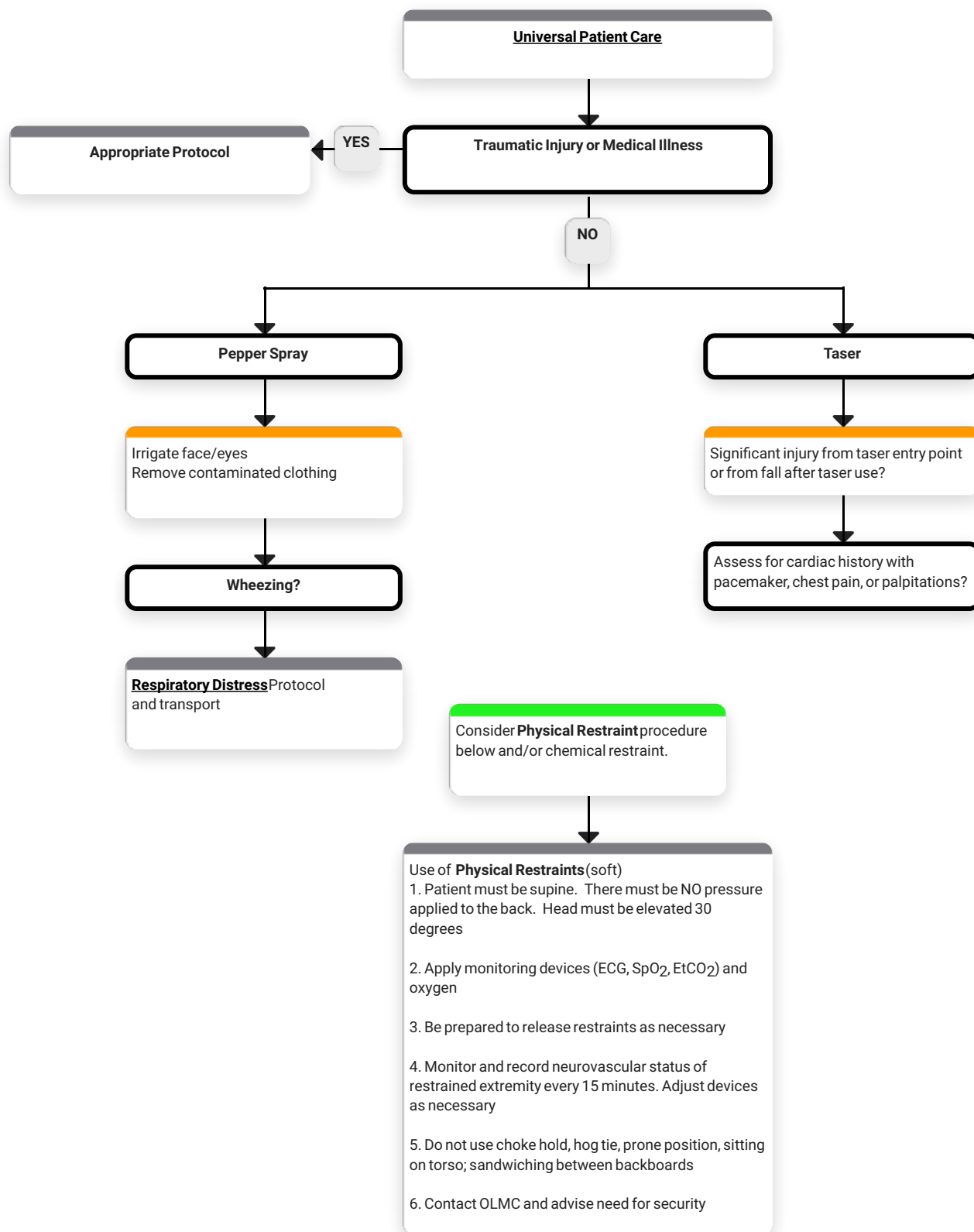
PEARLS

- Any patient contact that does not result in transport requires documentation and disposition
- Required vital signs on every patient include BP, pulse, RR, pain/severity
- Pulse oximetry, glucose measurement and temperature documentation is dependent on complaint
- Timing of transport based on patient's clinical condition
- If an ALS assessment has been performed and it is documented in the Patient Care Report that the Patient requires no further Advanced Interventions or assessments, then a BLS provider may accompany the patient during transport, so long as all appropriate care is taken to ensure patient care is never jeopardized.

Patient Safety



Pepper Spray/Taser Barb



Pepper Spray/Taser Barb - Medical Reference

HISTORY

- Traumatic injury
- Drug abuse
- Cardiac history
- Asthma
- Psych history

SIGNS AND SYMPTOMS

- External signs of trauma
- Palpitations
- SOB
- Wheezing
- Altered mental status
- Intoxication/substance abuse

DIFFERENTIAL

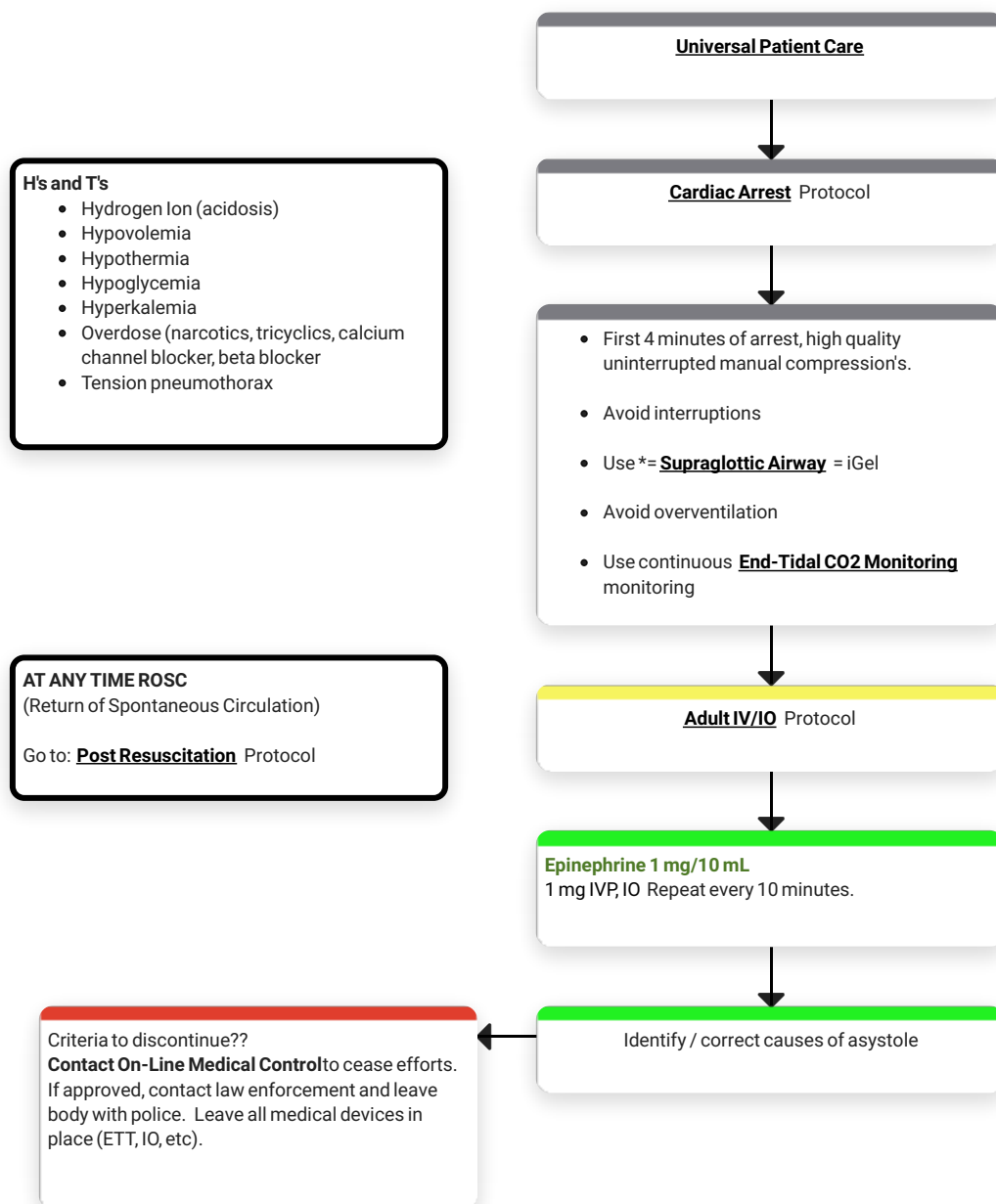
- Psychiatric emergency
- Traumatic injury
- Closed head trauma
- Asthma exacerbation
- Cardiac dysrhythmia

PEARLS

- Patients restrained by law enforcement devices cannot be transported in the ambulance without a law enforcement officer in the patient compartment who is capable of removing the device
- If there is any doubt about the cause of the patient's altered mental status, transport to hospital
- All patients in police custody retain the right to request transport

Adult Cardiovascular

Asystole



Asystole - Medical Reference

HISTORY:

- Past Medical History
- Medications
- Events
- End-stage renal failure
- Estimated downtime
- Hypothermia?
- Overdose?
- DNR?

SIGNS AND SYMPTOMS:

- Pulseless
- Apneic
- No electrical activity on ECG
- No auscultated heart tones

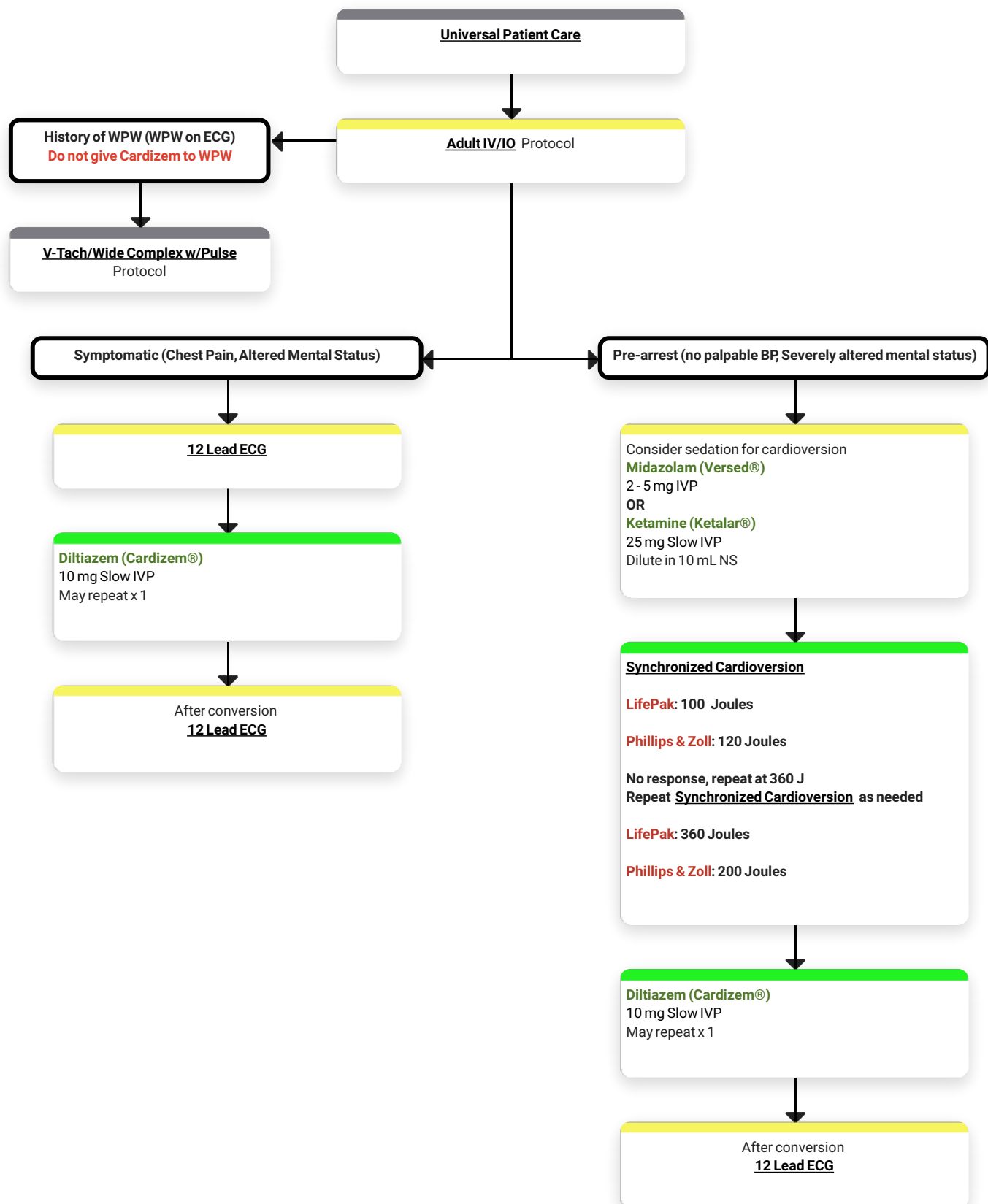
DIFFERENTIAL (H's and T's):

- Medical or Trauma
- Hypoxia
- Potassium (hypo/hyperkalemia)
- Overdose
- Acidosis
- Hypothermia
- Device error - check leads
- Death

PEARLS:

- *=Supraglottic Airway = iGel
- Always confirm asystole in more than one lead
- Always address correctable causes

Atrial Fibrillation



Atrial Fibrillation - Medical Reference

HISTORY:

- Medications (theophylline, diet pills thyroid, decongestants, digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past Medical History
- Palpitations
- Syncope

SIGNS and SYMPTOMS:

- HR > 160/min (varies)
- QRS < 0.12 sec
- Dizziness, CP, Dyspnea
- Possible rhythms:
 - Sinus tach
 - Atrial fib/atrial flutter
 - Multifocal atrial tachycardia

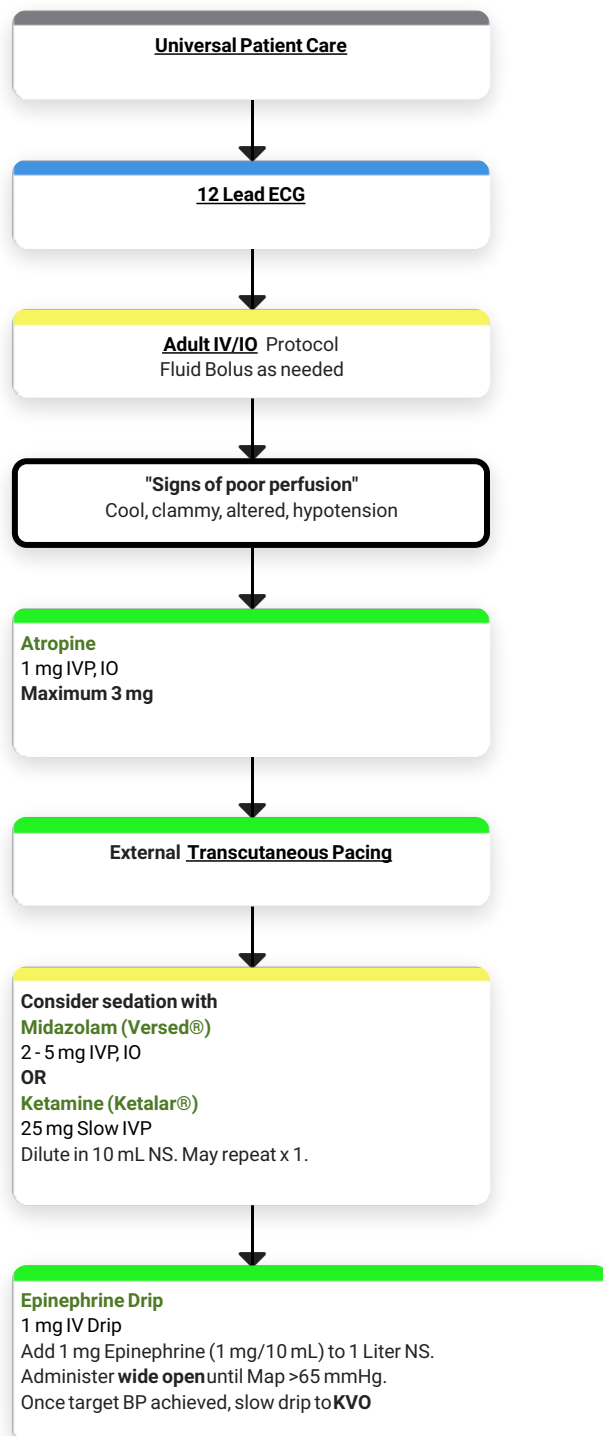
DIFFERENTIAL:

- Heart disease (WPW, Valvular)
- Sick Sinus Syndrome
- MI
- Electrolyte imbalance
- Exertion, pain, emotional stress - Fever
- Hypoxia
- Hypovolemia/anemia
- Overdose
- Hyperthyroidism
- PE

PEARLS:

- **Exam:** Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neuro
- Monitor for hypotension after diltiazem administration
- Monitor for respiratory depression/hypotension with midazolam
- Continuous pulse-oximetry required
- Document all effects of therapy/rhythm changes

Bradycardia



Bradycardia - Medical Reference

HISTORY:

- Past medical history
- Medications
 - Beta-blocker
 - Calcium channel blocker
 - Clonidine
 - Digoxin
- Events
- Pacemaker

SIGNS and SYMPTOMS

- HR < 60 bpm
- Chest pain
- Hypotension or shock
- Altered mental status
- Syncope

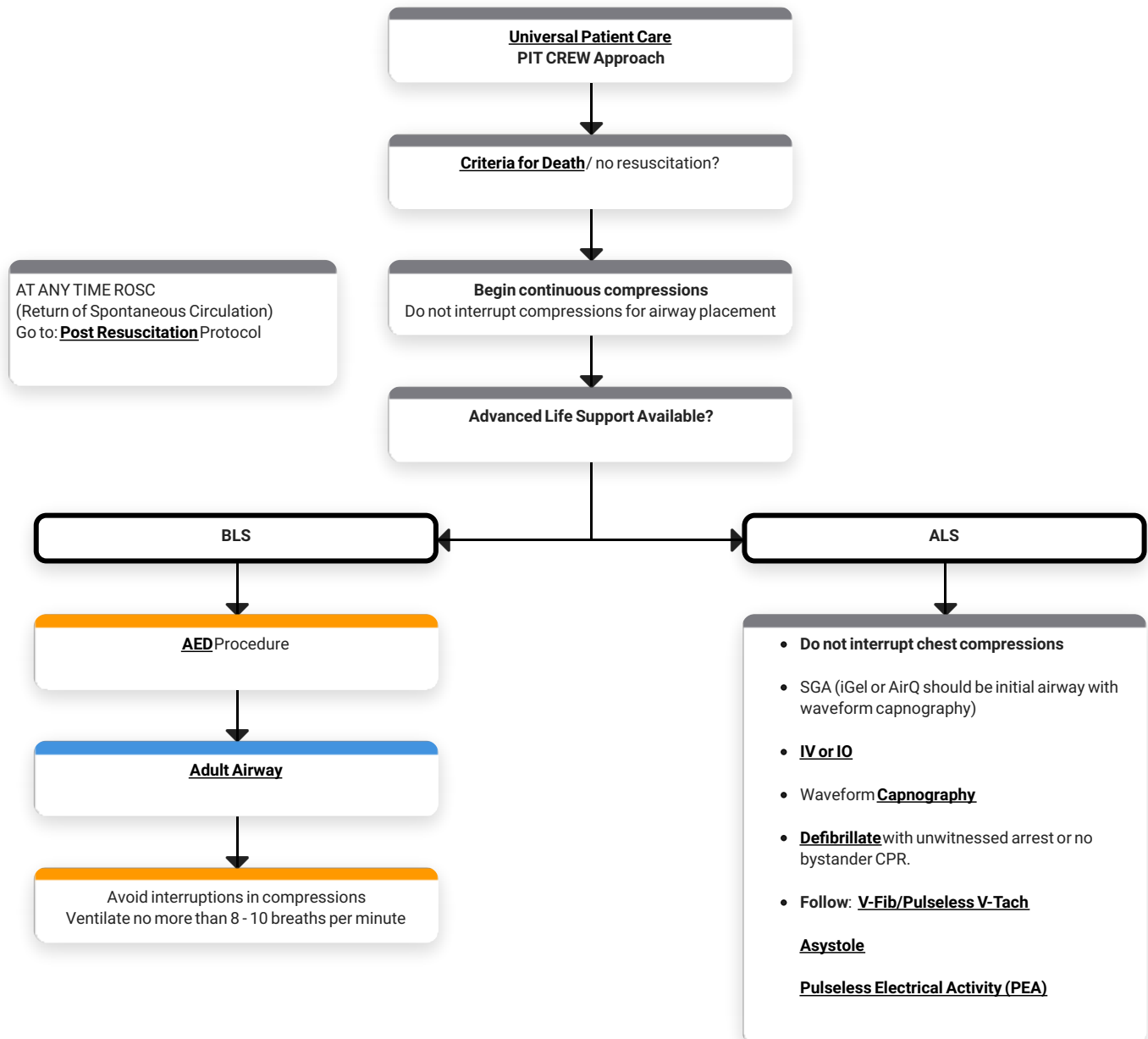
DIFFERENTIAL

- MI
- Hypoxia
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury
- CVA
- Spinal cord injury
- Sick sinus syndrome
- AV block
- Overdose

PEARLS:

- **Exam:** Mental status, neck, heart, lungs, neuro
- Use of lidocaine in heart block can worsen bradycardia and lead to asystole or death
- Pharmacologic treatment of bradycardia is based on presence or absence of symptoms
- If symptomatic, Treat
- If asymptomatic, Monitor only
- Consider treatable causes for bradycardia: i.e. beta or calcium channel blocker OD
- Remember to oxygenate and support ventilatory effort

Cardiac Arrest



Cardiac Arrest - Medical Reference

HISTORY:

- Events
- Downtime
- Past medical history
- Medications
- Terminal illness
- Lividity, rigor mortis
- DNR

SIGNS and SYMPTOMS:

- Unresponsive
- Apneic
- Pulseless

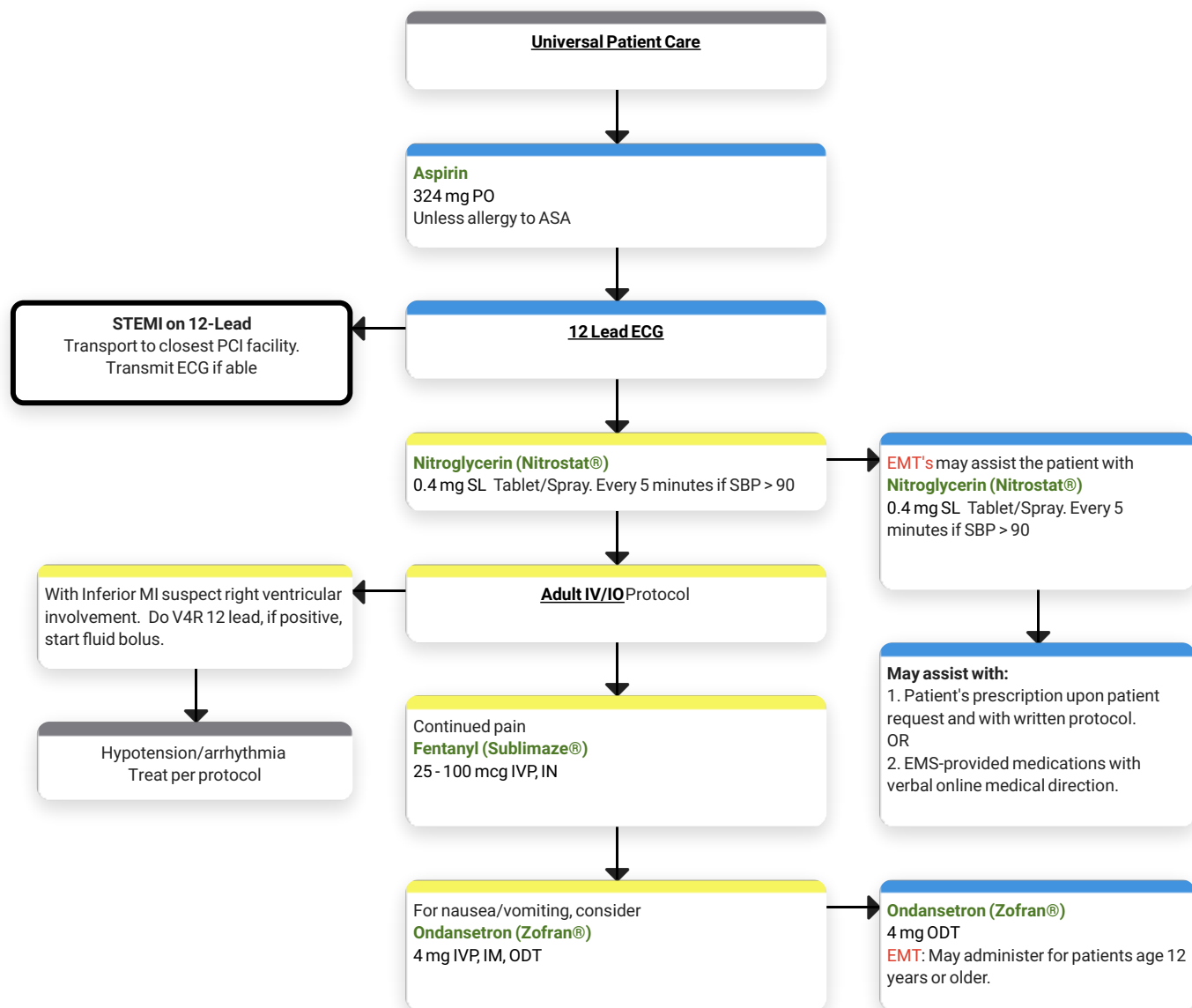
DIFFERENTIAL:

- Medical vs. Traumatic
- VF or Pulseless VT
- Asystole
- PEA

PEARLS:

- **Exam:** Mental status
- Success based on proper planning and execution; Pit Crew Approach to arrest. Assure adequate space and patient access.
- First airway is SGA with waveform capnography
- **Maternal arrest:** Treat mother per appropriate protocol with immediate notification of medical control and rapid transport.
- Adequate compressions and timely defibrillation are keys to success. No Termination of Resuscitation in the field for maternal arrest.

Chest Pain



Chest Pain - Medical Reference

HISTORY:

- Age
- Medications
- Erectile dysfunction meds?
- Past medical history
- Diabetes
- Allergies
- Onset
- Palpitation/provocation
- Quality
- Region/radiation/referred
- Severity
- Time (duration)

SIGNS and SYMPTOMS:

- Chest pain
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

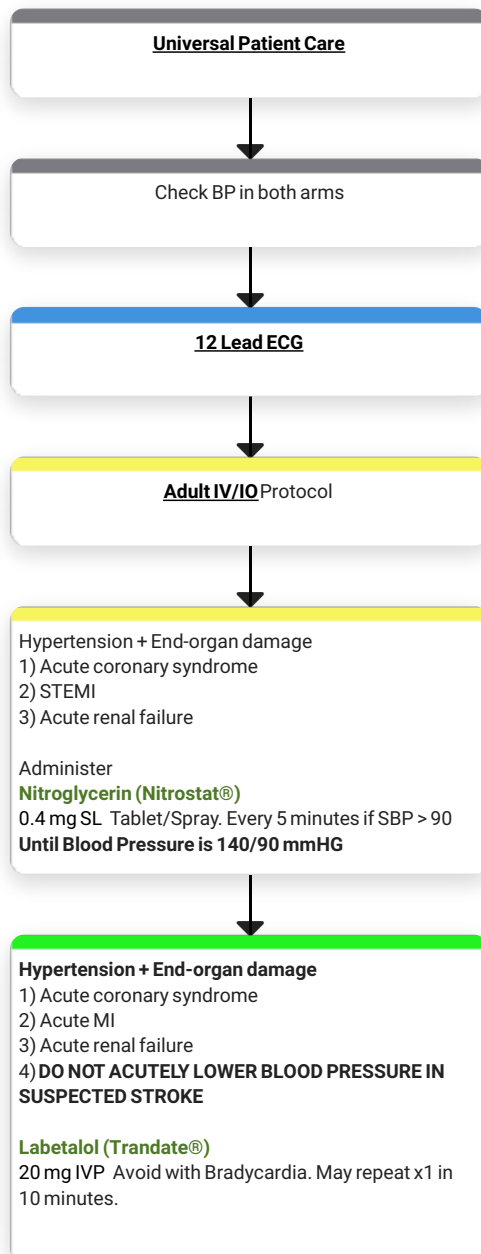
DIFFERENTIAL:

- Trauma vs. Medical
- Acute Coronary Syndrome vs. MI
- Pericarditis
- PE
- Asthma/COPD
- Pneumothorax
- Aortic dissection
- GE Reflux, hiatal hernia
- Esophageal spasm
- Chest wall pain
- Pleural pain
- Overdose (cocaine)

PEARLS:

- **Exam:** Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Avoid NTG in patient who has used erectile dysfunction meds (Viagra, Levitra, Cialis, etc .) in past 24 hours
- If patient has STEMI, establish 2nd IV
- Monitor for hypotension after NTG and/or Fentanyl administration
- Remember - diabetics, geriatric and female patients often have atypical symptoms

Hypertension



Hypertension - Medical Reference

HISTORY:

- Documented hypertension
- Related diseases: diabetes, CVA, renal failure, cardiac
- Medications (compliance?)
- Viagra, Levitra, Cialis?
- Pregnancy?

SIGNS and SYMPTOMS:

- Systolic BP > 200
- Diastolic BP > 120
- Plus:
 - Headache
 - Nosebleed
 - Blurred vision
 - Dizziness

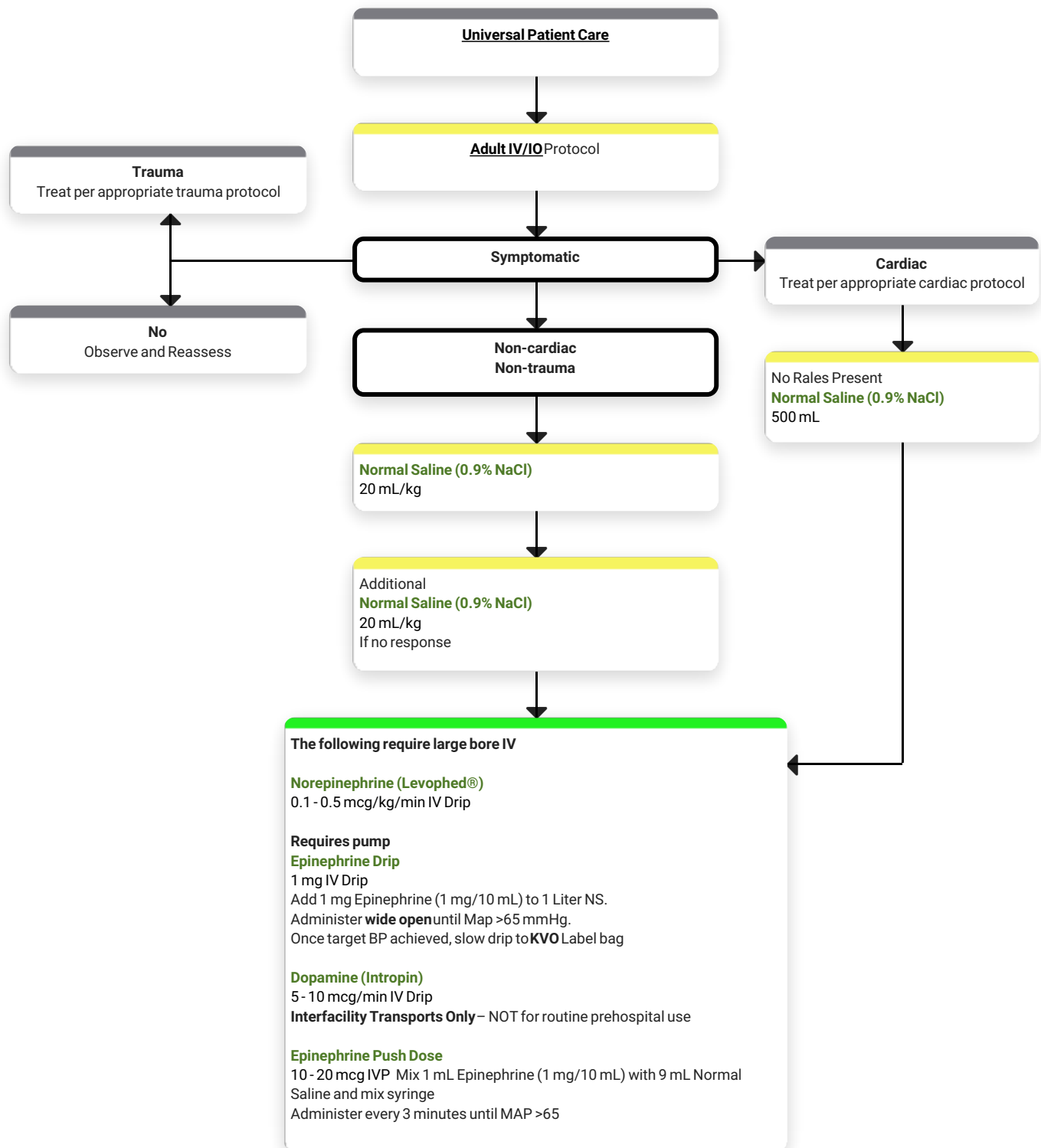
DIFFERENTIAL:

- Hypertensive encephalopathy
- CNS injury
- Cushing response = bradycardia with hypertension
- MI
- Aortic dissection
- Pre-eclampsia/Eclampsia

PEARLS:

- **Exam:** Mental status, skin, neck, lung, heart, abdomen, back, extremities, neuro
- Never treat elevated blood pressure based on one set of vital signs
- Symptomatic hypertension is usually revealed through end-organ damage to cardiac, CNS, or renal systems
- Transport symptomatic patients with hypertension with their head elevated

Hypotension/Shock Non-Trauma



Hypotension/Shock Non-Trauma - Medical Reference

HISTORY:

- Blood loss: GI, AAA, Ectopic, Vaginal
- Fluid loss - Vomiting, diarrhea, fever
- Infection
- Cardiac: ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- Poor PO intake history

SIGNS and SYMPTOMS:

- Restless, confused
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

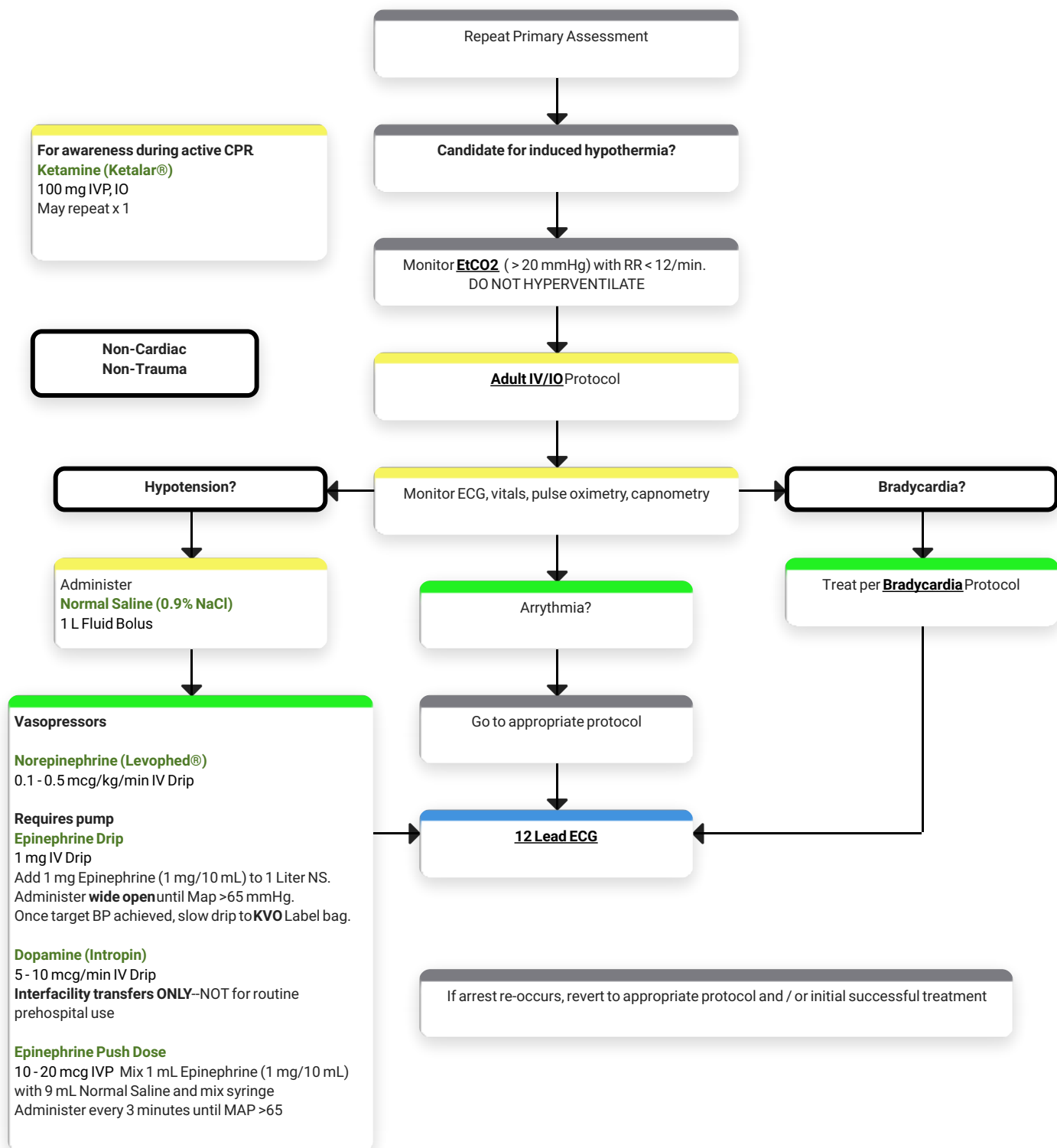
DIFFERENTIAL:

- Shock
 - Hypovolemic
 - Cardiogenic
 - Septic
 - Neurogenic
 - Anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- PE
- Tension pneumothorax
- Medications/OD
- Vasovagal
- Physiologic

PEARLS:

- **Exam:** Mental status, skin, heart, lungs, abdomen, back, extremities, neuro
- Hypotension = SBP < 90 mmHg
- Consider orthostatic vital signs on non-trauma patients with suspected blood or fluid loss
- Consider all causes of shock and treat per protocol
- Norepinephrine= Levophed. Use only in patients not responsive to Saline Bolus therapy; Must have large bore IV
- Monitor closely for extravasation; IV pump preferable. 4 mg ampule in 1000 ml Dextrose = 4 mcg/ml

Post Resuscitation



Post Resuscitation - Medical Reference

HISTORY:

- Respiratory Arrest
- Cardiac Arrest

SIGNS and SYMPTOMS:

- Return of Pulse (ROSC)

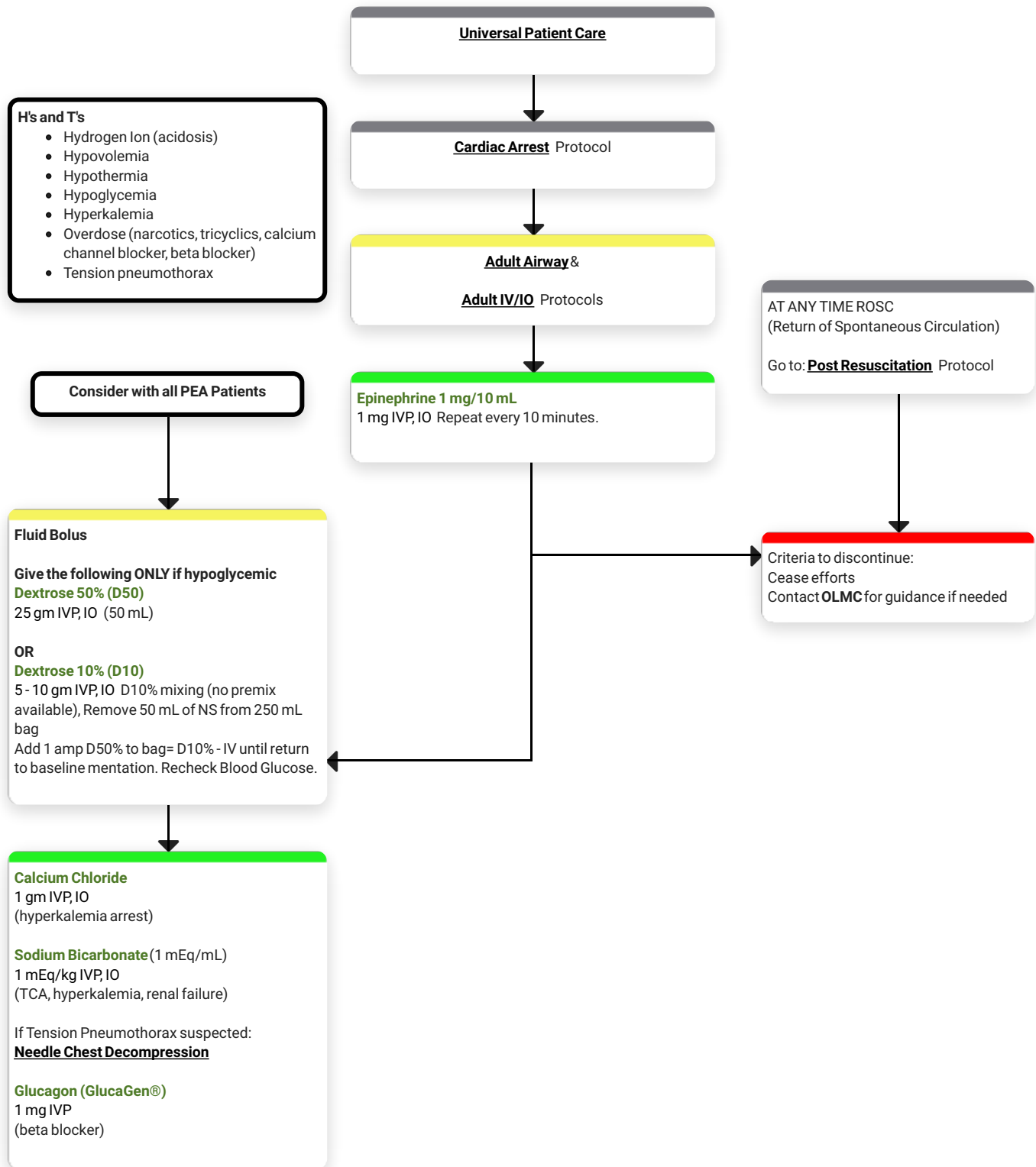
DIFFERENTIAL:

- Continue to address specific differential with original arrhythmia

PEARLS:

- **Exam:** Mental status, skin, neck, heart, lungs, abdomen, extremities, neuro
- Avoid hyperventilation
- Most patients post-resuscitation will require ventilatory assistance
- Post-resuscitation condition of patient changes rapidly
- Consult OLMC as needed regarding management
- Titrate Vasopressors to maintain MAP > 65 mmHg
- Ensure adequate fluid resuscitation is ongoing

Pulseless Electrical Activity (PEA)



Pulseless Electrical Activity (PEA) - Medical Reference

HISTORY:

- Past Medical History
- Medications
- Events
- End-stage renal failure
- Estimated downtime
- Hypothermia?
- Overdose?
- DNR?

SIGNS and SYMPTOMS:

- Pulseless
- Apneic
- No electrical activity on ECG
- No auscultated heart tones

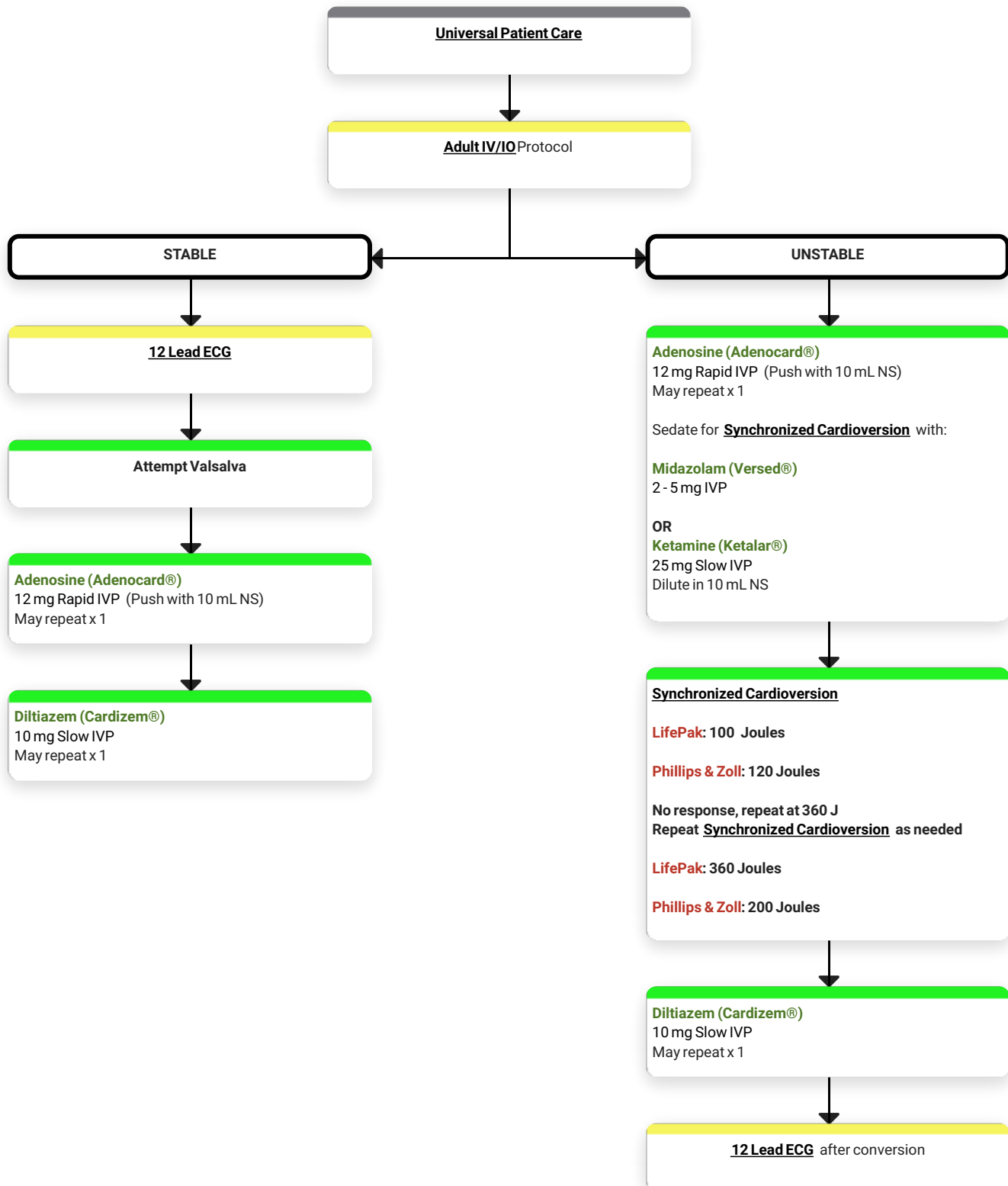
DIFFERENTIAL:

- Hypovolemia (trauma, AAA, other)
- Hypoxia
- Potassium(hypo/hyperkalemia)
- Overdose (TCA's, digoxin, beta-blockers, calcium channel blockers)
- Acidosis
- Hypothermia
- Cardiac tamponade
- Massive MI
- Hyperkalemia

PEARLS:

- Always confirm asystole in more than one lead
- Always address correctable causes

Supraventricular Tachycardia



Supraventricular Tachycardia - Medical Reference

HISTORY:

- Medications: Theophylline, diet pills thyroid supplements, decongestants, digoxin
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past Medical History
- Palpitations
- Syncope

SIGNS and SYMPTOMS:

- HR > 150/min
- QRS < 0.12 sec
- History of WPW go to **V-Tach** protocol
- Dizziness, Chest pain, Dyspnea
- Possible rhythms presenting
 - Sinus tach
 - Atrial fib/atrial flutter
 - Multifocal atrial tachycardia

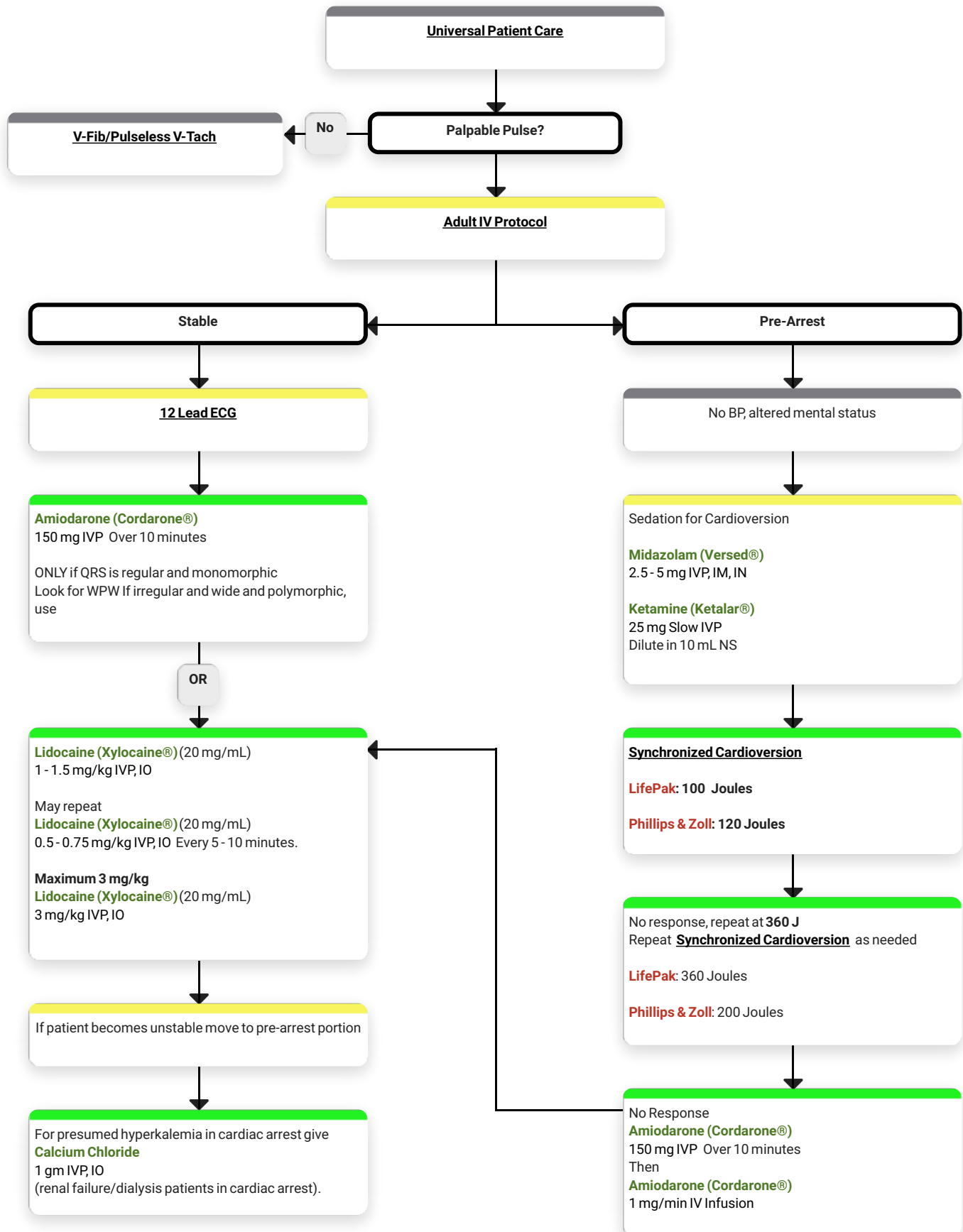
DIFFERENTIAL:

- WPW, Valvular heart disease
- Sick Sinus Syndrome
- MI
- Electrolyte imbalance
- Exertion, pain, emotional stress
- Fever
- Hypoxia
- Hypovolemia/anemia
- Overdose
- Hyperthyroidism
- PE

PEARLS:

- **Exam:** Mental status, skin, neck, lung, heart, abdomen, back, extremities, neuro
- History of WPW - do NOT give Cardizem
- Adenosine may not be effective in atrial flutter/fib, yet is not harmful
- Monitor for hypotension after Cardizem
- Monitor for respiratory depression and hypotension after Versed
- Continuous pulse oximetry
- Document rhythm changes with therapeutic interventions

Ventricular Tachycardia/Wide Complex w/Pulse



Ventricular Tachycardia/Wide Complex w/Pulse - Medical Reference

HISTORY:

- Past history, meds, diet, drugs
- Syncope/near syncope
- Palpitations
- Pacemaker
- Allergies: lidocaine

SIGNS and SYMPTOMS:

- Ventricular tachycardia on ECG
- Conscious, rapid pulse
- Chest pain, SOB
- Dizziness
- Rate usually 150-180 bpm
- QRS > 0.12 sec

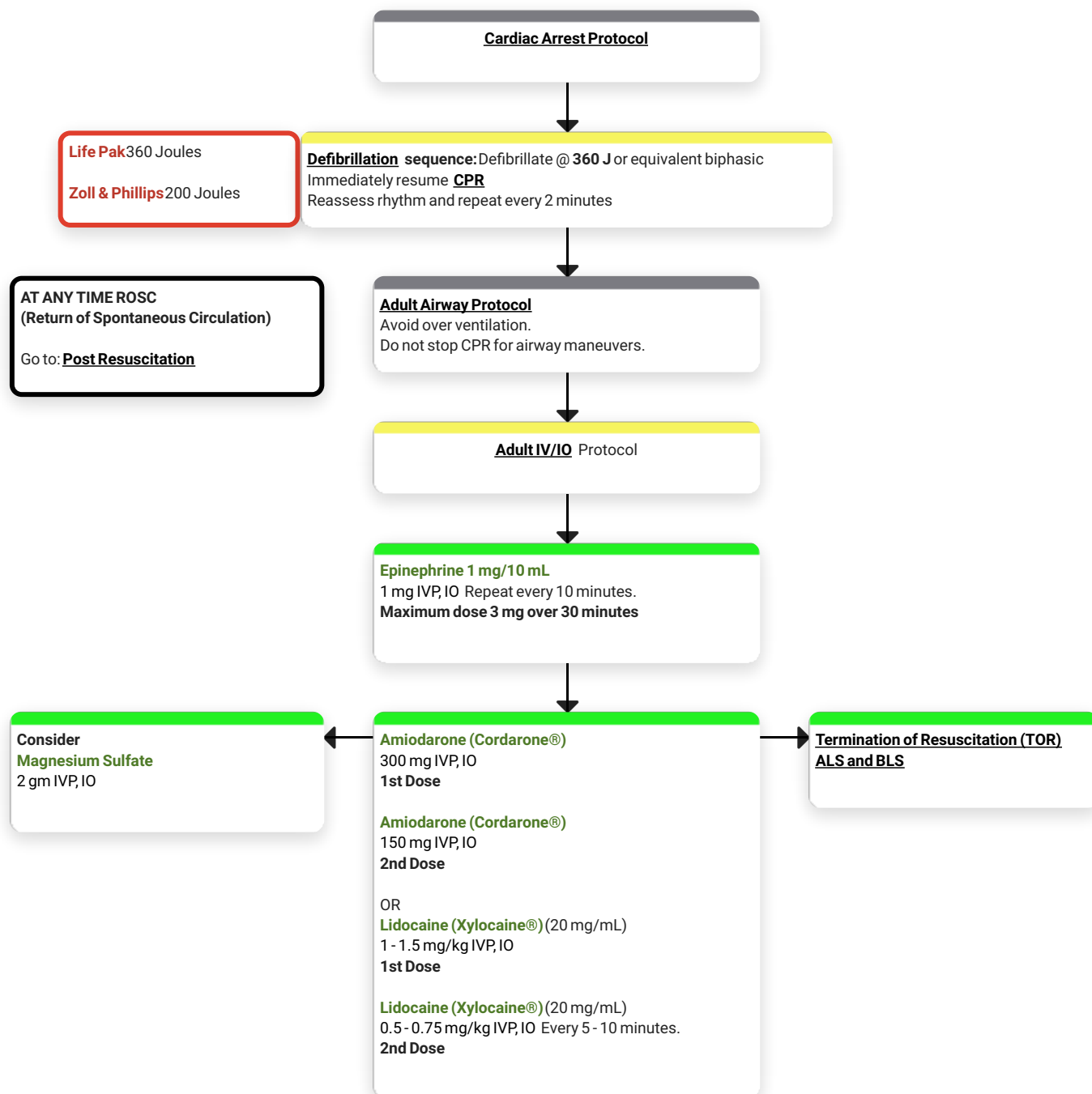
DIFFERENTIAL:

- Artifact/device failure
- Cardiac
- Endocrine/metabolic
- Hyperkalemia
- Drugs
- Pulmonary

PEARLS:

- **Exam:** Mental status, skin, neck, heart, lungs, abdomen, back, extremities, neuro
- Torsades de Pointes give Magnesium Sulfate 2 gram IV
- For presumed hyperkalemia (renal failure, dialysis) administer Calcium Chloride 1 gm and 50 mEq Sodium Bicarbonate

V-Fib/Pulseless V-Tach



V-Fib/Pulseless V-Tach - Medical Reference

HISTORY:

- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal Failure/hemodialysis
- DNR

SIGNS and SYMPTOMS:

- Unresponsive
- Ventricular fibrillation or ventricular tachycardia on ECG

DIFFERENTIAL:

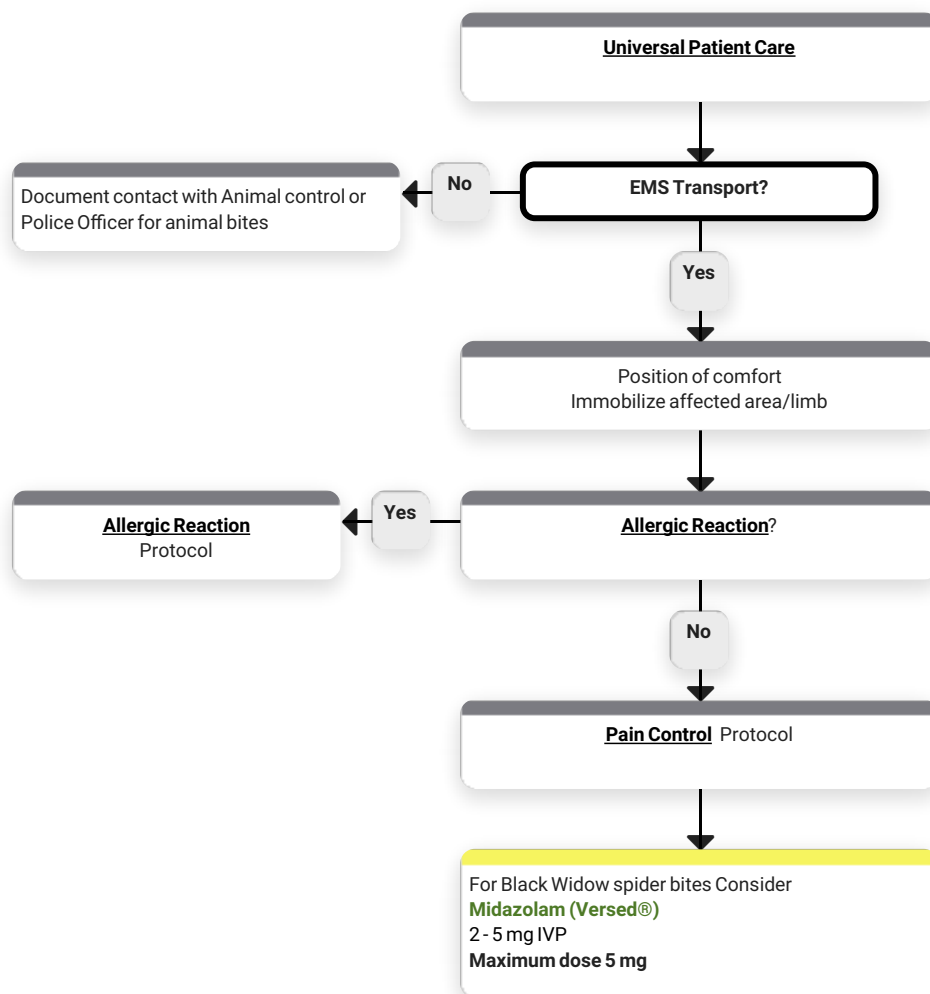
- Asystole
- Artifact/device failure
- Cardiac
- Endocrine/metabolic
- Drugs
- Pulmonary

PEARLS:

- Do not stop CPR for airway maneuvers, consider placement of SGA (iGel or AirQ)
- For suspected **HYPERKALEMIC ARREST** administer Calcium Chloride and Sodium Bicarbonate
- For **Torsades de Pointes** - 2 grams Magnesium Sulfate
- Effective CPR and early defibrillation are keys to success
- If unable to intubate, insert Supraglottic airway (King LTD) or i-Gel

Adult Environmental

Bites and Envenomations



Bites and Envenomations - Medical Reference

HISTORY:

- Type of bite/sting
- Description of animal involved
- Time, location, size of bite/sting
- Previous reaction to bite/sting
- Domestic vs. wild
- Tetanus and rabies risk
- Immunocompromised patient

SIGNS and SYMPTOMS

- Rash, skin break, wound
- Pain, swelling, redness
- Blood oozing from the wound
- Infection?
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension/shock

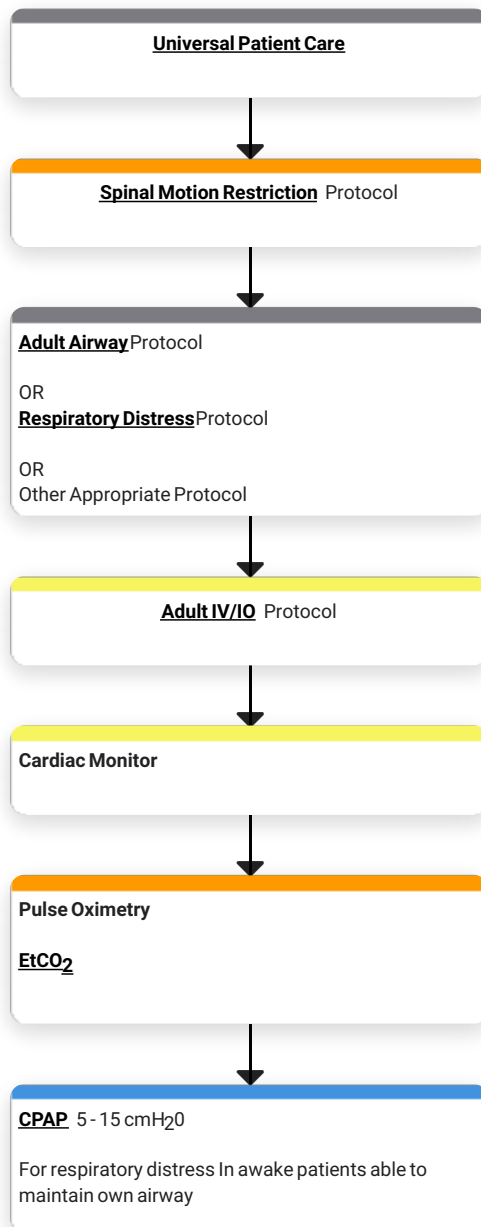
DIFFERENTIAL:

- Animal bite
- Human bite
- Snake bite
- Spider bite
- Insect sting/bite
- Infection risk
- Rabies/tetanus risk

PEARLS:

- **Exam:** Mental status, skin, extremities, neck, lung, heart, abdomen, back, and neuro
- Human bites worse than animal bites
- Carnivore bites more likely to become infected and have risk of Rabies exposure
- Cat bites progress to infection rapidly
- Black widow spider bites are minimally painful, but over a few hours, muscle pain and severe abdominal pain develop
- Brown recluse spider bites are minimally painful. Tissue necrosis develops over a few days

Drowning/Submersion



Drowning/Submersion - Medical Reference

HISTORY:

- Submersion in water regardless of depth
- Possible history of trauma
- Duration of immersion
- Temperature of water
- Fresh or saltwater

SIGNS and SYMPTOMS:

- Unresponsive
- Mental status change
- Decreased or absent vital signs
- Vomiting
- Coughing

DIFFERENTIAL:

- Trauma
- Pre-existing medical condition
- Pressure injury (diving)
 - Barotrauma
 - Decompression sickness

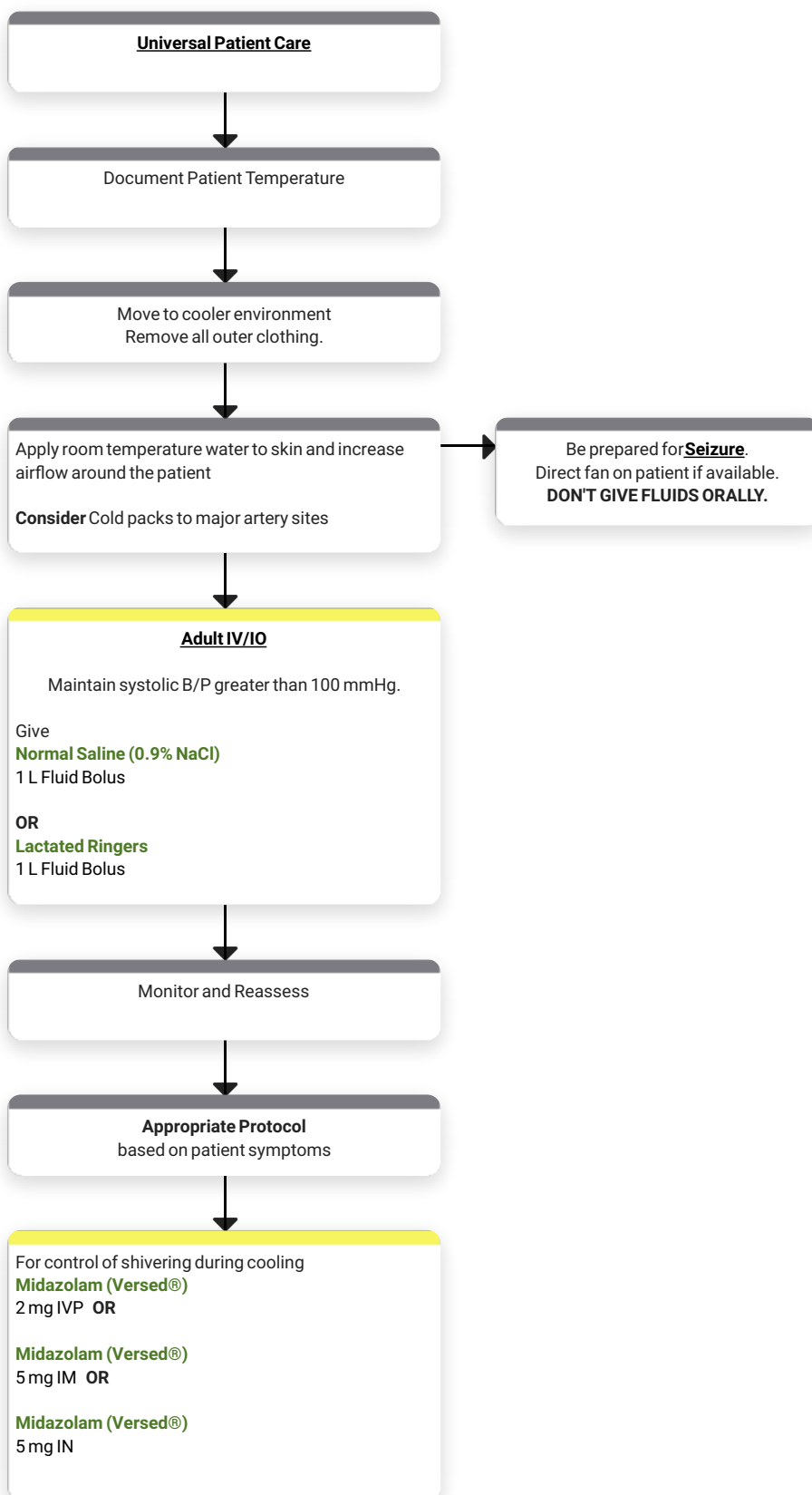
PEARLS:

- **Exam:** Trauma survey, head, neck, chest, pelvis, back, extremities, skin, neuro
- With cold water there is no time limit - resuscitate all
- All victims should be transported for evaluation due to potential for worsening over next several hours
- All appropriately trained rescuers to remove victims from areas of danger
- With pressure injuries, consider transport to a hyperbaric chamber
 - (The closest hyperbaric facility by air ambulance)

Hyperthermia

Celsius	Fahrenheit
37.0	98.6
37.2	99
37.8	100
38.3	101
38.8	102
39.4	103
40.0	104
40.5	105
41.1	106
41.6	107
42.2	108

Athletic field hyperthermia: If available at scene, cool patient in ice bath before transport if safe to do so.



Hyperthermia - Medical Reference

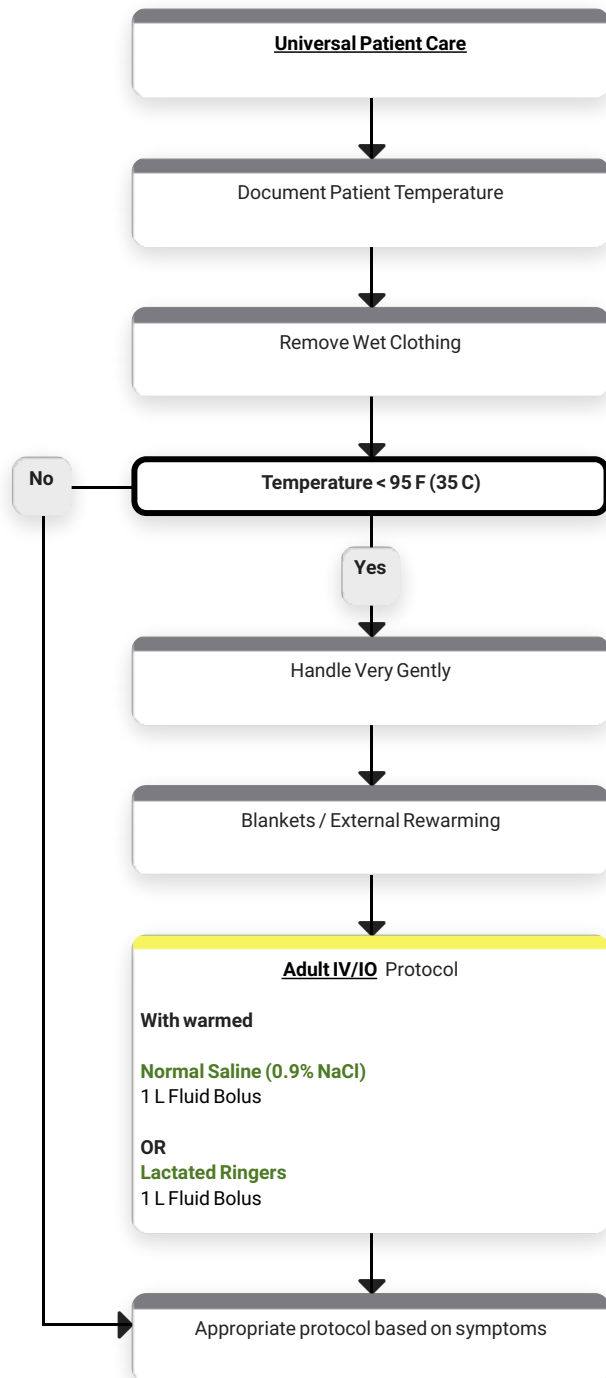
Some causes of Hyperthermia are:

- High temperatures in the environment or
- Excessive exercise in moderate to extremely high temperatures.
- Also, Older or ill incapacitated patient, a failing of temperature regulating center.

SIGNS and SYMPTOMS:

- **Heat Cramps**
 - Severe muscle cramps
- **Heat Exhaustion**
 - Altered mental status
 - Dizziness
 - Nausea & Vomiting
 - Headache
 - Elevated core body temperature
- **Heat Stroke**
 - Extremely elevated core body temperature
 - The absence of sweating with:
 - Hot red or flushed dry skin
 - Rapid pulse
 - Difficulty breathing
 - Strange behavior
 - Hallucinations
 - Confusion
 - Agitation
 - Disorientation
 - Seizure
 - Coma

Hypothermia



Hypothermia - Medical Reference

HISTORY:

- Age
- Exposure to environment even in normal temperatures
- Past medical history/meds
- Exposure to extreme cold
- Length of exposure/wetness
- Drug use
- Infection/sepsis
- Extremes of age

SIGNS and SYMPTOMS:

- Cold, clammy
- Shivering
- Mental status change
- Extremity pain/sensory abnormality
- Bradycardia
- Hypotension
- Shock

DIFFERENTIAL:

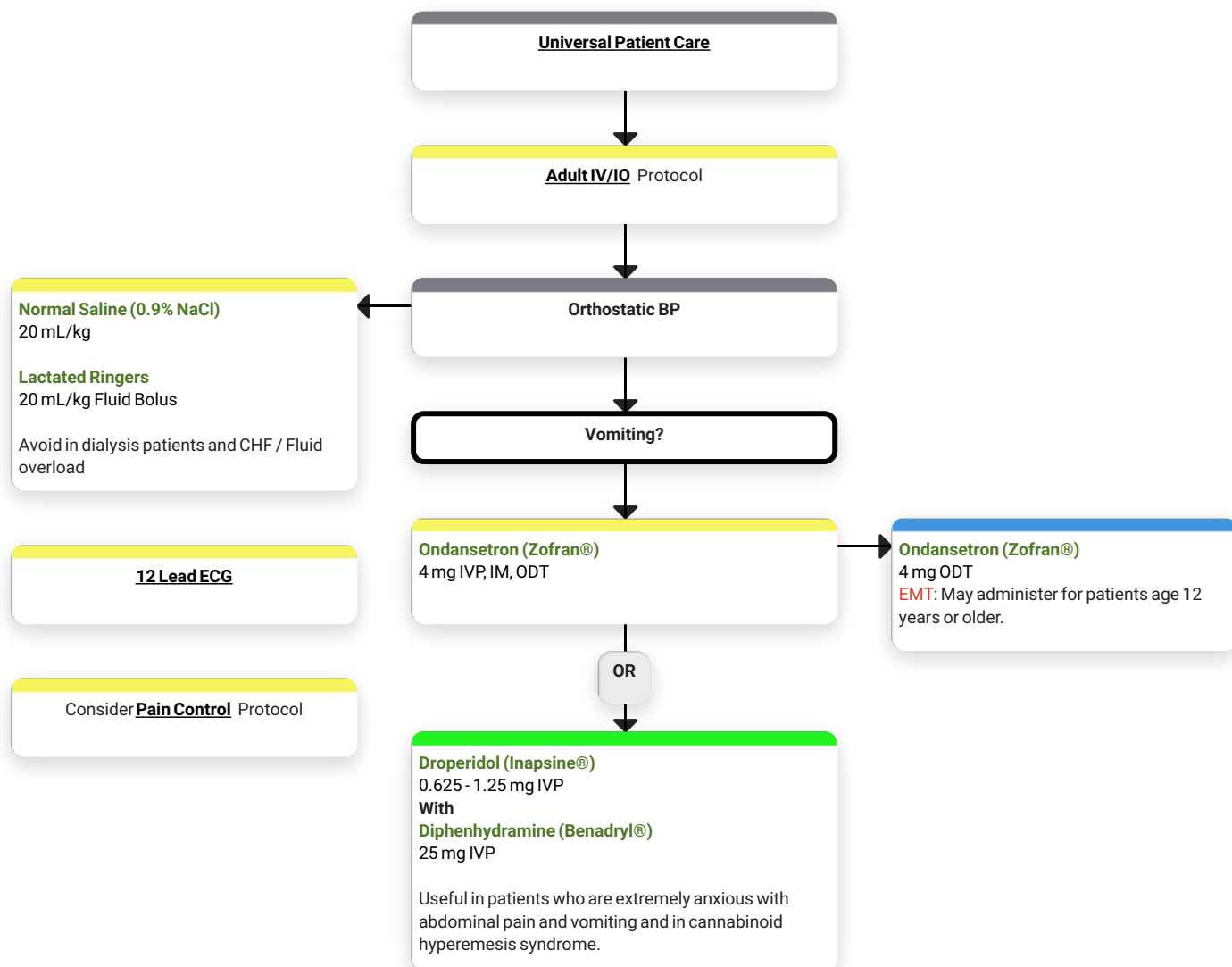
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
 - CVA
 - Head injury
 - Spinal cord injury

PEARLS:

- **Exam:** Mental status, skin, HEENT, heart, lungs, neuro
- No patient considered dead until warm
- Core temperature < 35 C (95 F)
- Extremes of age susceptible
- Temperature less than 31 C (88 F) V-Fib is common cause of death. Handle these patients gently to prevent V-Fib
- Hypothermia may produce severe bradycardia
- Shivering stops below 32 C (90 F)

Adult Gastrointestinal

Abdominal Pain



Abdominal Pain - Medical Reference

HISTORY:

- Age
- Past medical history/surgical history
- Medications
- Onset
- Palliation/Provocation
- Quality
- Region/Radiation/Referred
- Severity
- Time
- Fever
- Last meal
- Last bowel movement/emesis
- Menstrual history (pregnant?)

SIGNS and SYMPTOMS:

- Pain
- Tenderness
- Nausea/vomiting/diarrhea
- Dysuria
- Constipation
- Vaginal bleeding/discharge
- Pregnancy
- **Associated Symptoms:**
 - Fever
 - Headache
 - Weakness
 - Malaise
 - Myalgias
 - Cough
 - Mental status changes
 - Rash

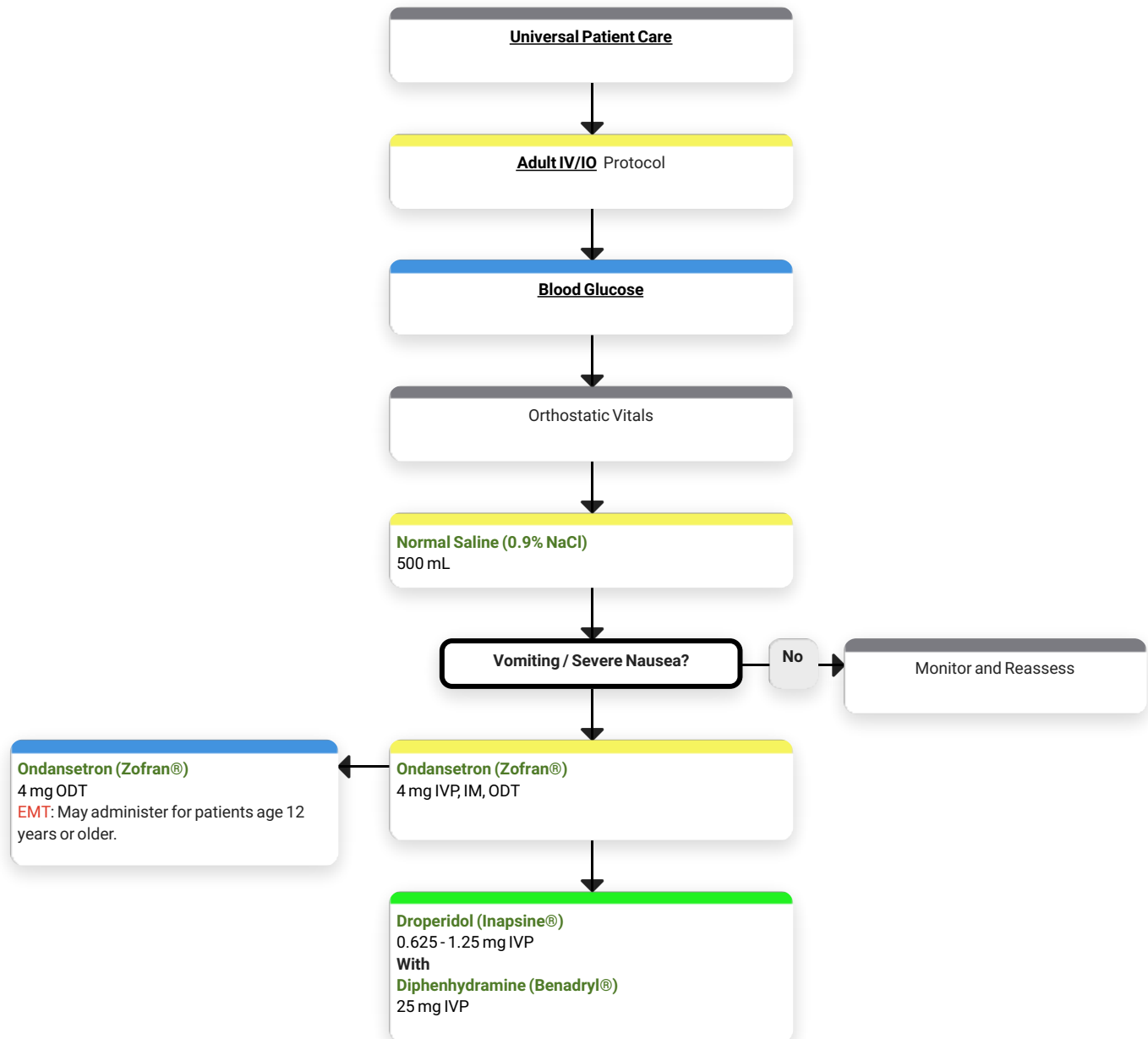
DIFFERENTIAL:

- Pneumonia/PE
- Liver
- Peptic ulcer/gastritis
- Gallbladder
- MI
- Pancreatitis
- Kidney stone
- AAA
- Appendicitis
- Bladder/prostate
- Pelvic (ectopic, PID, ovarian cyst)
- Spleen
- Diverticulitis
- Bowel Obstruction
- Gastroenteritis

PEARLS:

- **Exam:** Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Abdominal pain in women of childbearing age g Ectopic pregnancy until proven otherwise
- Consider AAA in pts. > 50 years old with abdominal pain
- Repeat vital signs after therapeutic interventions
- **Zofran (Ondansetron) ODT = Oral Dissolving Tablet, may be given on the tongue (4 mg ODT)
 - (Do Not Give Ondansetron to 1st-trimester pregnant patients)

Vomiting/Diarrhea



Vomiting/Diarrhea - Medical Reference

HISTORY:

- Age
- Last meal
- Last BM / emesis
- Duration
- Sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history
- Travel history
- Bloody emesis / diarrhea

SIGNS and SYMPTOMS:

- Pain Constant, sharp, dull, etc.
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation
- **Associated Symptoms:**
 - Fever
 - Headache
 - Blurred vision
 - Weakness
 - Myalgias
 - Cough
 - Dysuria
 - Mental status changes
 - Rash

DIFFERENTIAL:

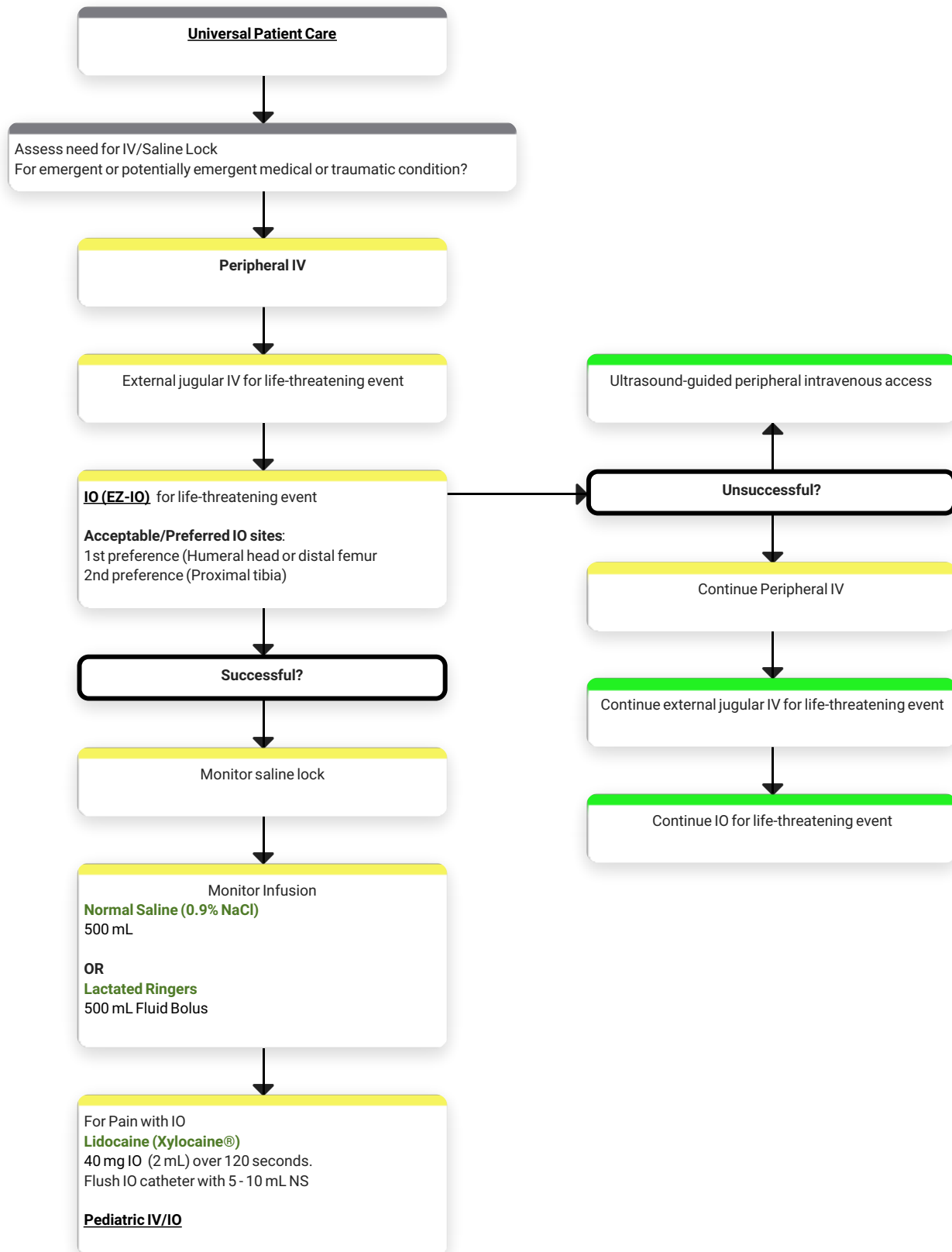
- CNS
- MI
- Drugs
- GI / renal
- DKA
- Gynecologic
- Infections
- Electrolyte imbalance
- Food or toxin induced
- Medication/substance abuse
- Pregnancy
- Psychologic

PEARLS:

- **Exam:** Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neuro - Maintain high suspicion of cardiac event for persons with diabetes or neuropathies

Adult General Medical

Adult IV/IO

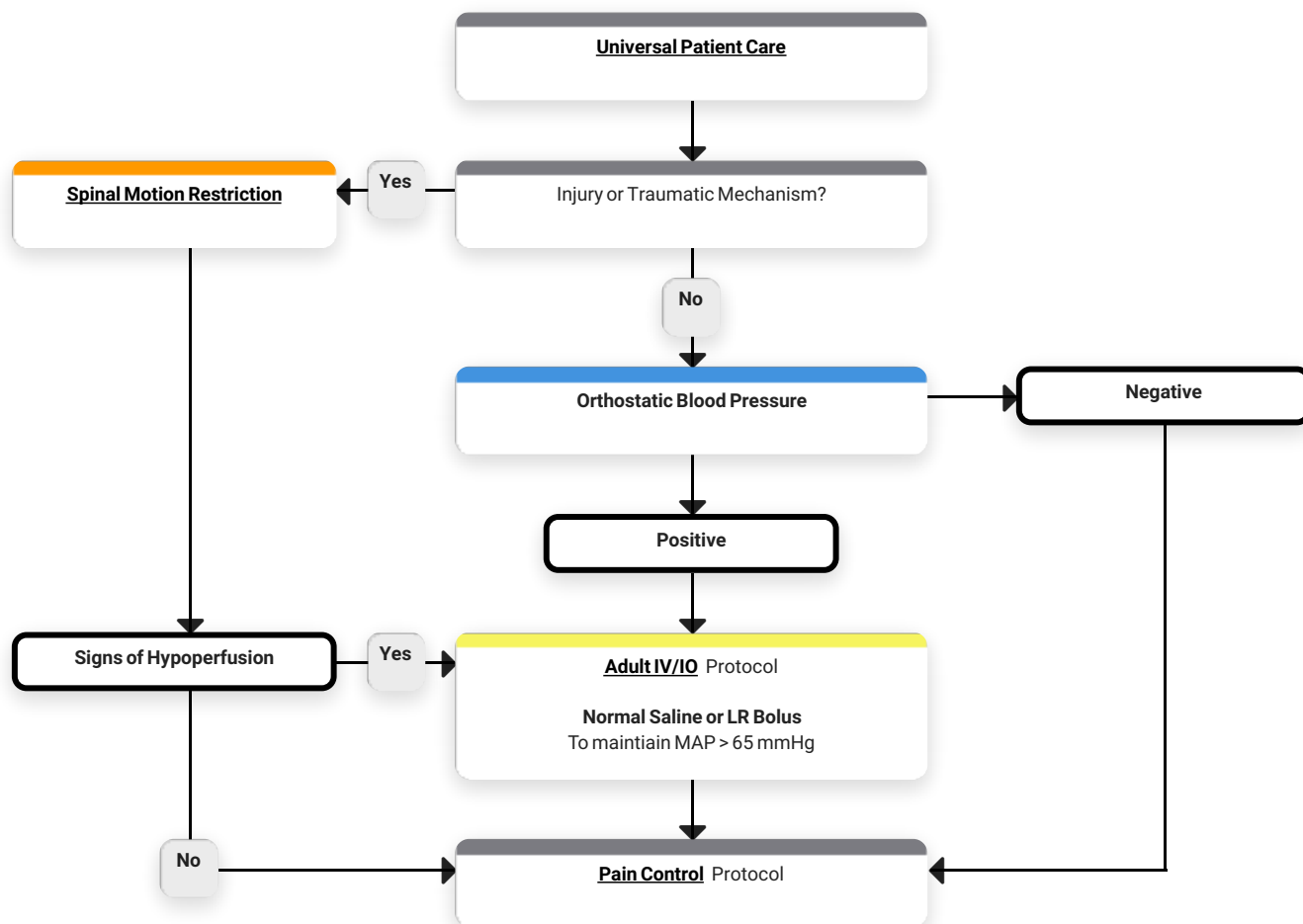


Adult IV/IO - Medical Reference

PEARLS:

- IO with EZIO for adult or pediatric patient for cardiac arrest or unresponsive patient with no available IV site
- Saline locks are preferred unless fluid bolus anticipated
- External jugular (>12 years old)
- Any pre-hospital fluids or medications approved for IV use may be given through IO
- All rates KVO unless giving fluid bolus
- Use microdrips for patients under 6 years old (if available)
- External jugular lines can be attempted initially in life-threatening events with no obvious peripheral site
- In CARDIAC ARREST, pre-existing dialysis shunt or external central venous catheter may be used
- In patients who are hemodynamically unstable or in extremis, contact OLMC prior to accessing dialysis catheter or central catheters
- Any venous catheter which has already been accessed prior to EMS arrival may be used
- Upper extremity preferred to lower extremity IV sites
- In post mastectomy patients, avoid IV/injection or blood pressure in arm on affected side

Back Pain



Back Pain - Medical Reference

HISTORY:

- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain/injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Better or worse with activity

SIGNS and SYMPTOMS:

- Pain
- Swelling
- Pain with ROM
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel or bladder dysfunction

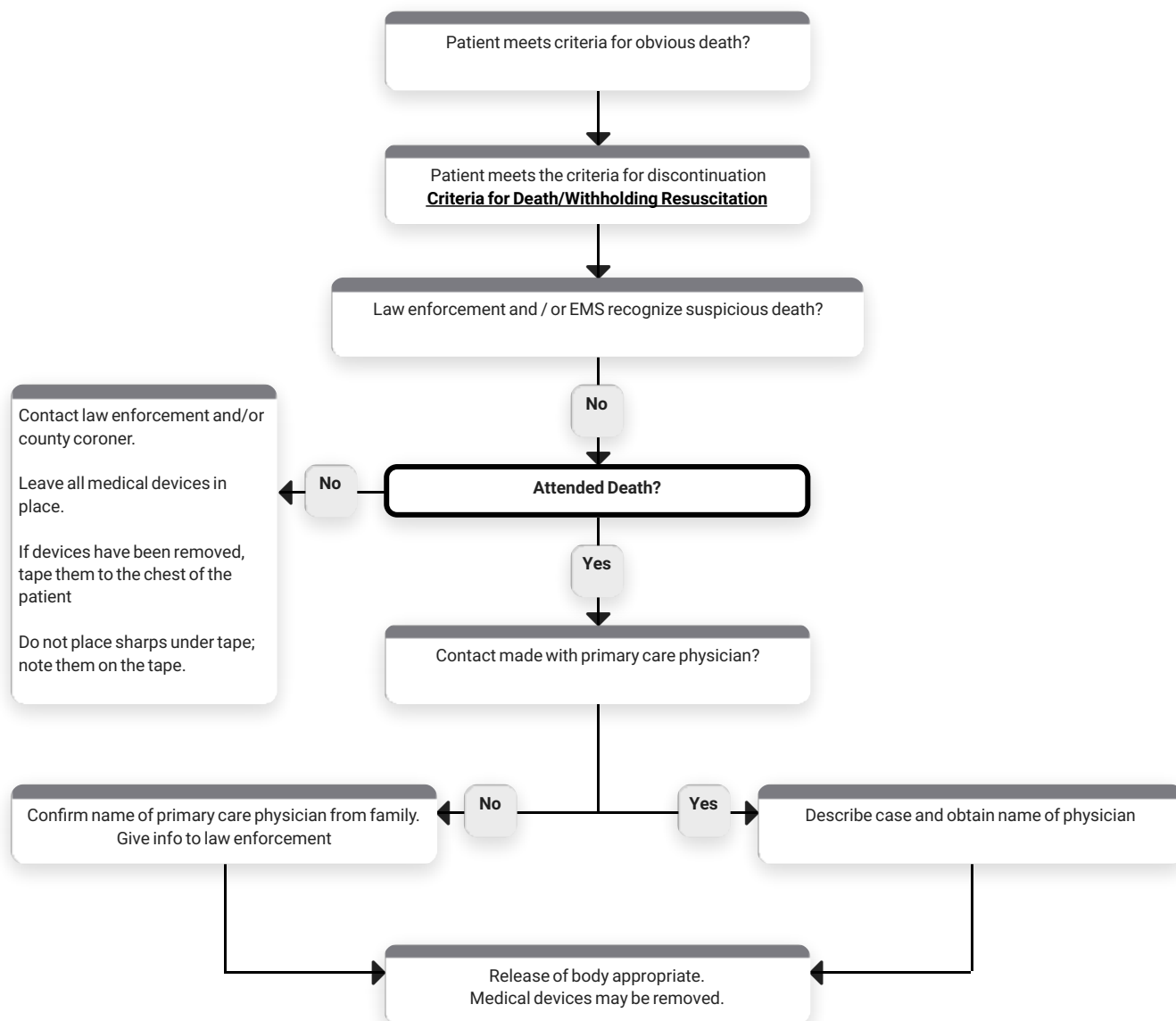
DIFFERENTIAL:

- Muscle spasm/strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis
- Aortic aneurysm
- Pneumonia
- Cardiac

PEARLS:

- **Exam:** Mental status, HEENT, neck, chest, lungs, abdomen, back, extremities, neuro
- Abdominal aneurysm: consider in patients > 50 years old
- Kidney stones typically present with acute onset flank pain radiating to groin area
- Patients with midline pain over the spinous process should be spinally immobilized
- Any bowel or bladder incontinence is a significant finding which requires immediate medical evaluation

Deceased Persons



Deceased Persons - Medical Reference

HISTORY:

- Patient encountered by EMS who meets criteria for obvious death
- Patient with duly executed DNR who is apneic
- Patient for whom resuscitation efforts are ceased on-scene

KEY INFORMATION:

- Name of primary care physician
- Known medical conditions
- Last time known to be alive

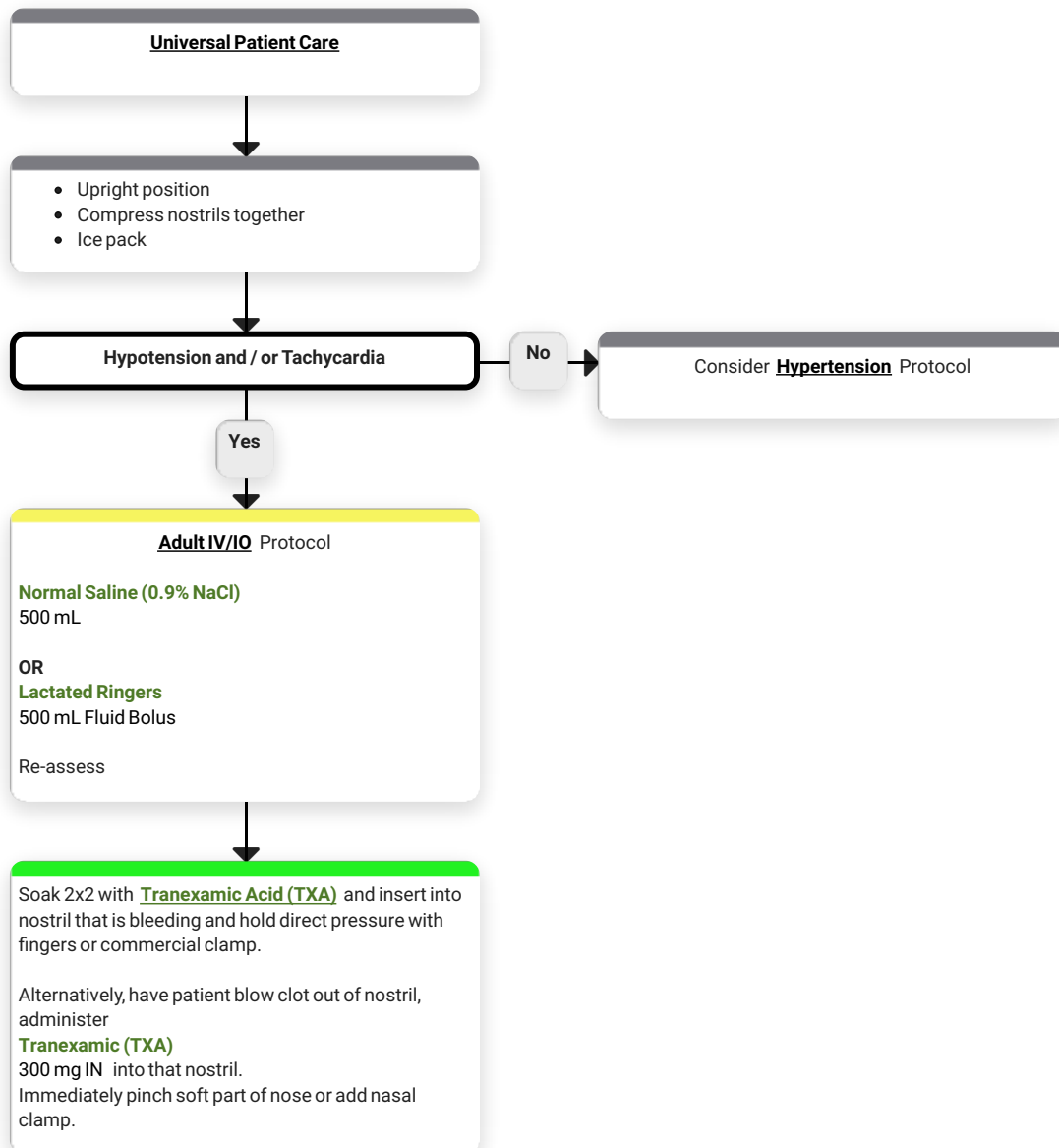
DIFFERENTIAL:

- Attended death - a patient with a primary care physician who apparently died of medical causes (natural death)
- Unattended death - a patient without a primary care physician who apparently died of medical causes (natural death)
- Suspicious death (law enforcement)

PEARLS:

- The body of a deceased person may be released to the funeral home if the death is attended and law enforcement confirms that the death is not suspicious.
- It is preferred to communicate directly with the primary care physician prior to releasing the body. All reasonable attempts to contact the PCP must be made.
- If the death is unattended, the Medical Examiner must be contacted.
- If the death is traumatic, the Medical Examiner must be contacted.

Epistaxis



Epistaxis - Medical Reference

HISTORY:

- Age
- Past medical history
- Medication (BP, anticoagulants)
- Trauma
- Previous nosebleeds
- Duration
- Quantity

SIGNS and SYMPTOMS:

- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

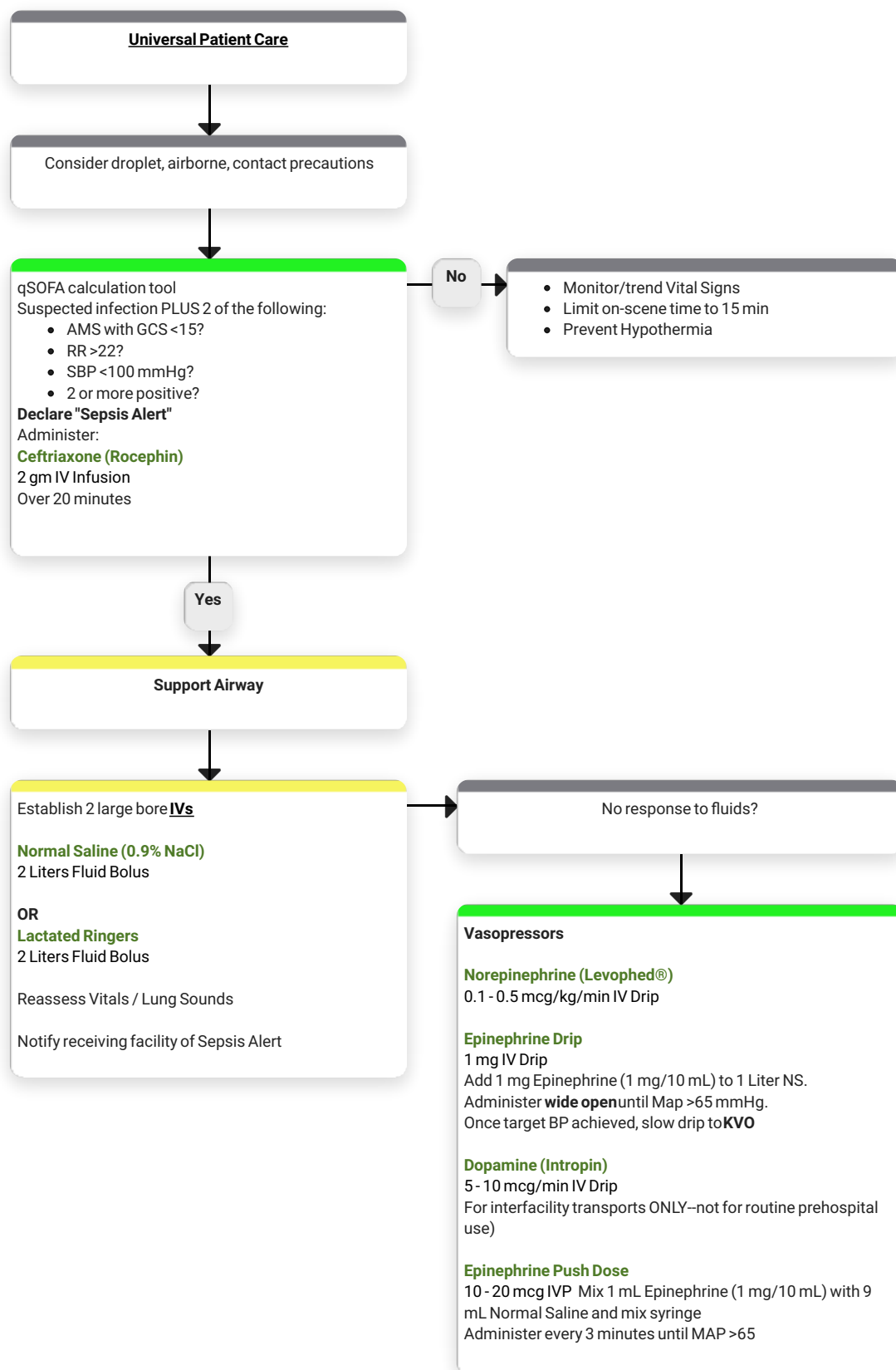
DIFFERENTIAL:

- Trauma
- Infection
- Allergic rhinitis
- Lesions (polyps/ulcers)
- Hypertension

PEARLS:

- **Exam:** Mental status, HEENT, neck, heart, lungs, neuro
- It is difficult to quantify the amount of blood loss in epistaxis
- Bleeding may be posterior and you may see the patient expel blood clots from the mouth
- Anticoagulants include: aspirin, Coumadin, Plavix, NSAIDS, Pradaxa, Eliquis, Xarelto, Lovenox

Fever/Suspected Sepsis



Fever/Suspected Sepsis - Medical Reference

HISTORY:

- Age
- Duration
- Severity
- Past medical history
- Medications
- Immunocompromised (HIV, transplant, diabetes, cancer)
- Exposure
- Last acetaminophen/ibuprofen use

SIGNS and SYMPTOMS:

- Warm
- Flushed
- Sweaty
- Chills/rigors
- Myalgias, cough, chest pain
- Headache
- Dysuria
- Abdominal pain
- Mental status change
- Rash

DIFFERENTIAL:

- Infection/sepsis
- Cancer/tumors/lymphomas
- Medication reaction
- Connective tissue disease
- Hyperthyroid
- Heat stroke
- Meningitis

PEARLS:

- **Exam:** Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neuro
- SIRS = Systemic Inflammatory Response Syndrome = Fever > 38 (100.4) or < 36 (96.8); HR > 90; RR > 20, Decreased EtCO₂
- Sepsis: one or more organs begins to fail. Septic shock = sustained hypotension after aggressive fluid resuscitation
- Avoid hypoxia. Consider CPAP early; Intubate for altered mental status/respiratory failure
- Avoid overventilation to prevent acute lung injury
- Avoid pressors (Norepinephrine) until adequate fluid resuscitation has been performed
- Febrile seizure are more likely in children with history of febrile seizures with rapid elevation in temperature
- Droplet precautions include standard PPE plus surgical mask for provider and NRB or surgical mask for pt. Use for suspected influenza, meningitis, mumps, strep when spread by large droplets suspected
- Airborne precautions include standard PPE plus a N-95 mask for providers and surgical mask/NRB for pt. Use for TB, measles, varicella
- Contact precautions include standard PPE plus gown, change gloves after every patient contact, strict handwashing precautions.
- Use with MRSA, scabies, shingles, or other illnesses spread by contact
- All hazards precautions include standard PPE + airborne + contact > Use during initial phase of outbreak with unknown agent

Pain Control - Medical Reference

HISTORY:

- Age
- Location
- Duration
- Severity
- Past medical history
- Medications
- Drug allergies

SIGNS and SYMPTOMS:

- Severity
- Quality
- Radiation
- Relation to movement
- Increased with palpation

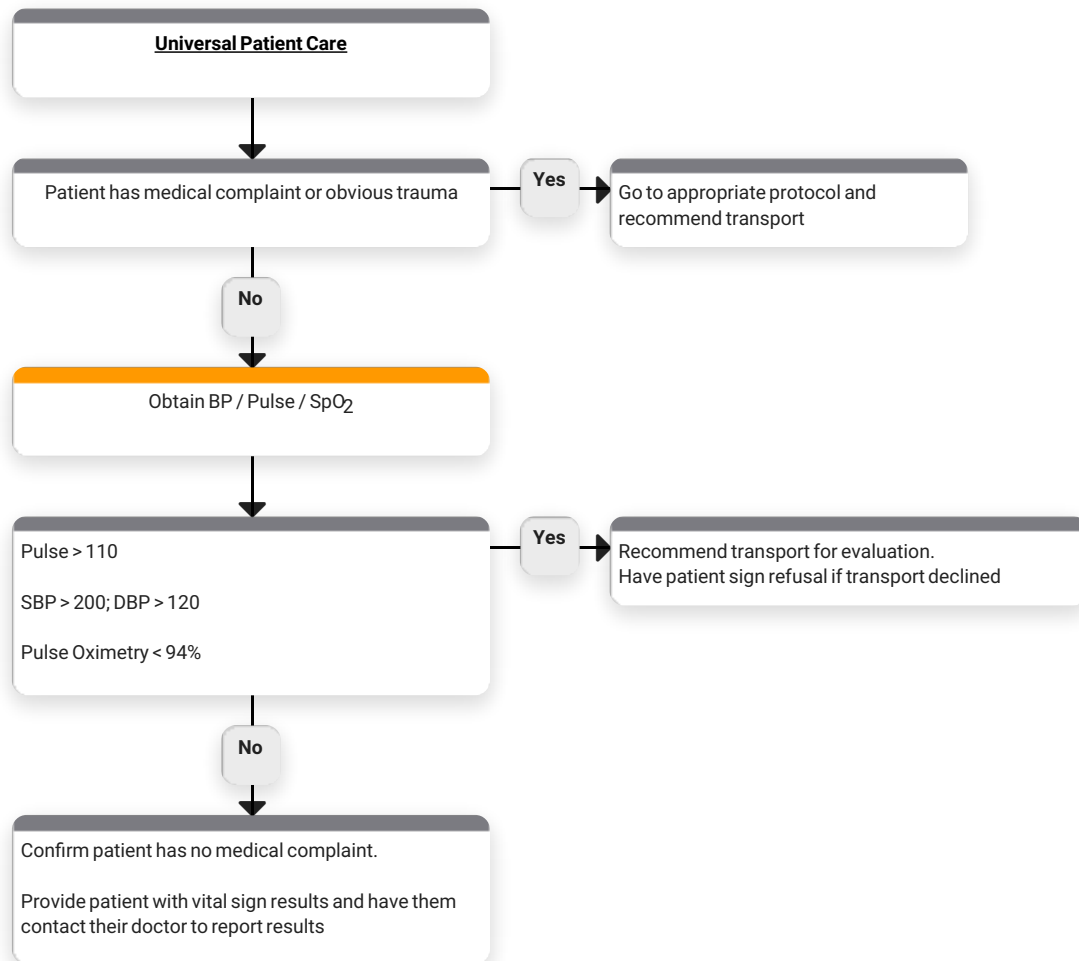
DIFFERENTIAL:

- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural/respiratory
- Neurogenic
- Renal

PEARLS:

- Pain severity is a vital sign and must be recorded pre- and post-IV / IM pain medications
- Vitals should be obtained pre, post, and at disposition with all pain medications
- Contraindications to Morphine = hypotension, altered mental status, head injury, respiratory distress, severe COPD
- Document drug allergies
- Observe for drug reaction

Well Person Check



Well Person Check - Medical Reference

HISTORY:

- Patient presents requesting blood pressure check
- EMS response to "assist invalid"
- Other situation in which patient does not have a medical complaint or obvious injury

SIGNS and SYMPTOMS:

- Assess for medical complaint
- For patients with hypertension, check for chest pain, dyspnea, neuro changes
- For invalid assist calls, check for syncope, chest pain, trauma, inability to ambulate

DIFFERENTIAL:

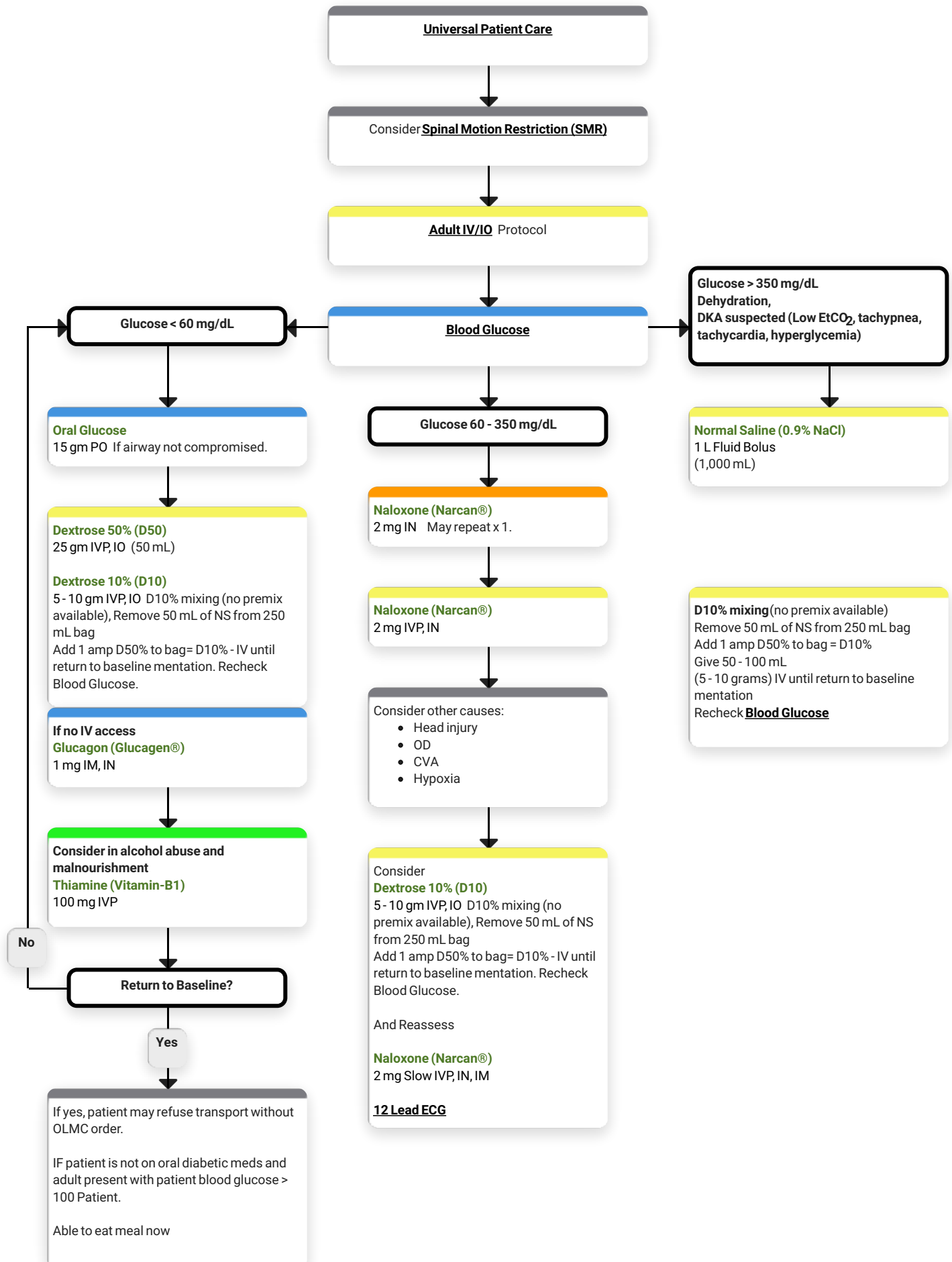
- Hypertensive urgency
- Hypertensive emergency
- Syncope
- Cardiac ischemia/dysrhythmia
- Fracture
- Head trauma

PEARLS:

- Patients who are denying more severe symptoms may initially present for a routine check
- All persons who request service shall have a PCR completed
- For this category of patient, the PCR may be brief, but must include vital signs and documentation of a lack of medical complaint.
- Complete trauma exams on patients with potential mechanism for trauma

Adult Neurological

Altered Mental Status



Altered Mental Status - Medical Reference

HISTORY:

- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or ingestion
- Past medical history
- Medications
- History of trauma

SIGNS and SYMPTOMS:

- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin, fruity breath)
- Kussmaul respiration, dehydration

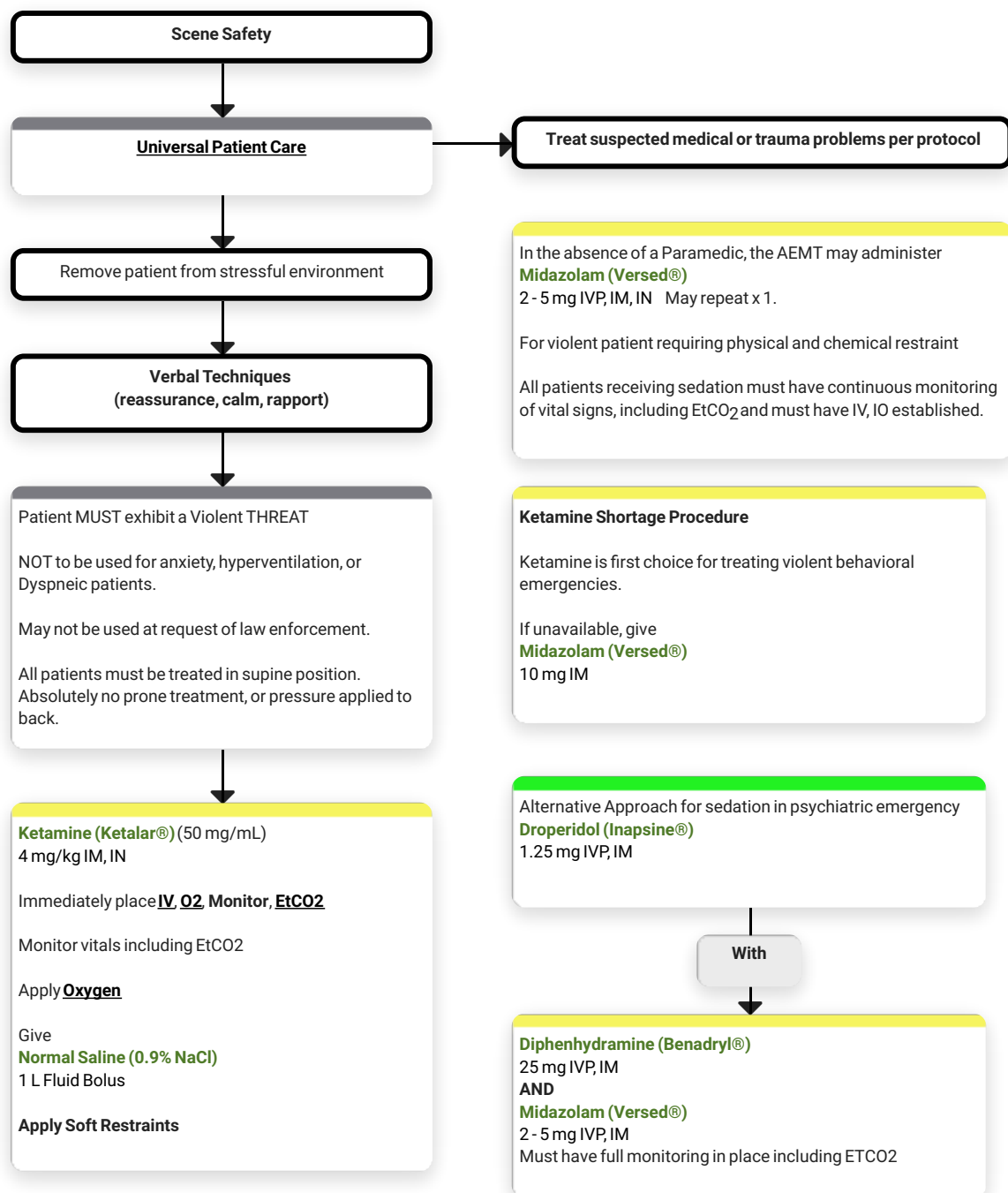
DIFFERENTIAL:

- Head trauma
- CNS (CVA, tumor, seizure, infection)
- Infection
- Thyroid
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper/hypoglycemia)
- Toxicologic
- Acidosis/Alkalosis
- Environmental exposure
- Pulmonary
- Electrolyte abnormality
- Psychiatric

PEARLS:

- **Exam:** Mental status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Use caution for environmental toxin or Haz-Mat exposure as cause of mental status changes
- Safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood sugar after D50/glucagon
- Do not let alcohol confuse clinical picture
- Do not give oral glucose if patient cannot protect airway
- Consider patient restraints
- Omit thiamine if no signs of malnutrition or alcoholism

Behavioral Emergency



Behavioral Emergency - Medical Reference

HISTORY:

- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse/OD
- Diabetes

SIGNS and SYMPTOMS:

- Anxiety
- Agitation
- Confusion
- Affect change
- Hallucinations
- Delusional thoughts
- Bizarre behavior
- Combative/violent
- Expression of suicidal/homicidal thoughts

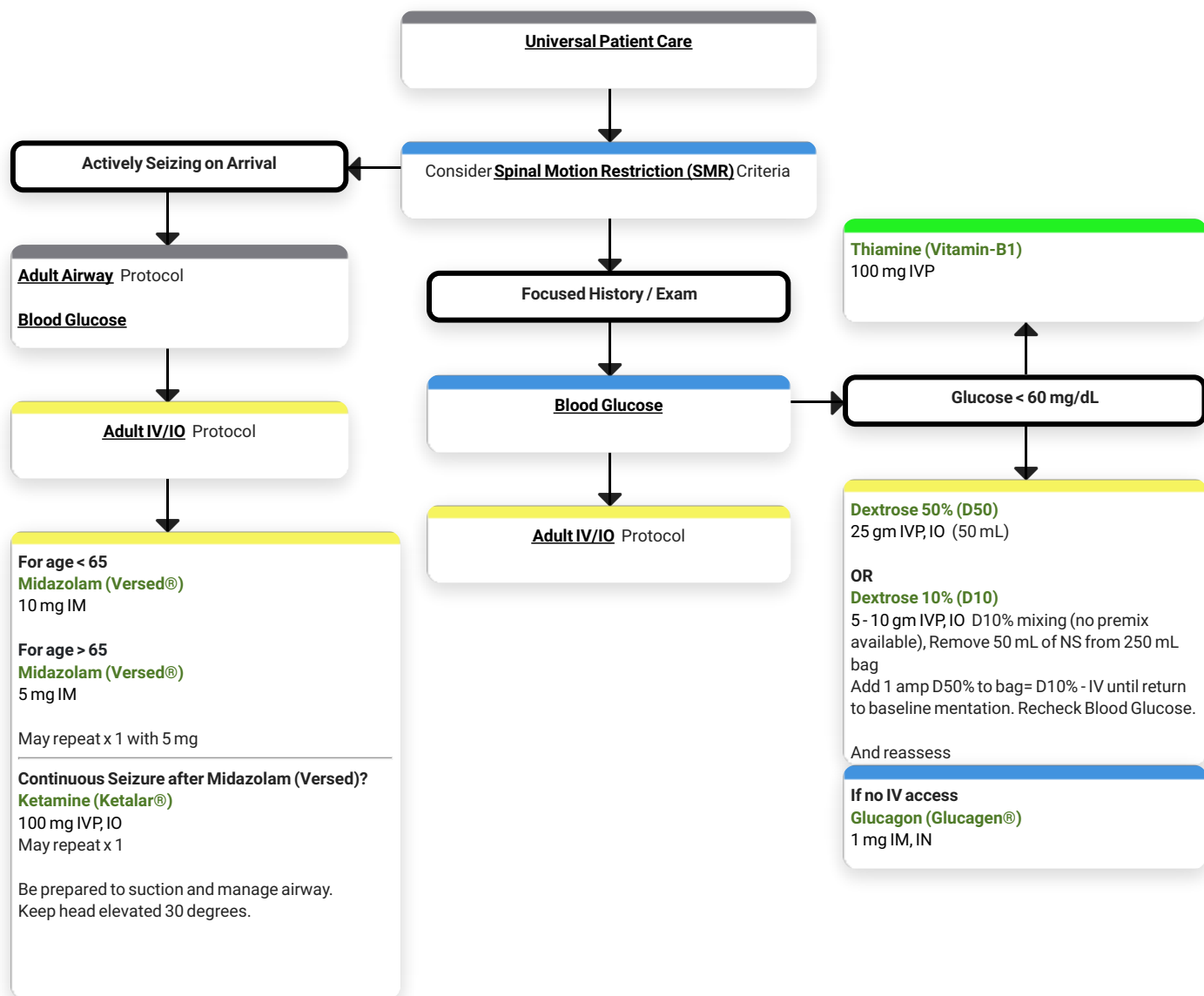
DIFFERENTIAL:

- See altered mental status
- Hypoxia
- Alcohol intoxication
- Medication effect/OD
- Withdrawal syndromes
- Depression
- Bipolar
- Schizophrenia

PEARLS:

- **Exam:** Mental status, skin, heart, lungs, neuro
- **All patients given sedation must have IV, EtCO₂, SpO₂, cardiac monitoring, supplemental oxygen**
- Consider ALL causes for behavior: Trauma vs. Medical (hypoglycemia, OD, hypoxia, head injury, substance abuse)
- Do not overlook the possibility of domestic violence or child abuse
- Patients with violent behavioral emergencies are often dehydrated and acidotic (low EtCO₂)
- All patients with physical or chemical restraints must be continuously observed by ALS personnel on scene in a supine position ONLY
- Depending on concentration, if calculated ketamine dose is greater than 5 ml, you will need 2 separate injection sites. ALWAYS double check proper dosing with your partner

Seizure



Seizure - Medical Reference

HISTORY:

- Reported/witnessed seizure
- Previous seizure history
- Medical alert tag
- History of trauma
- History of diabetes
- History of pregnancy

SIGNS and SYMPTOMS:

- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconsciousness

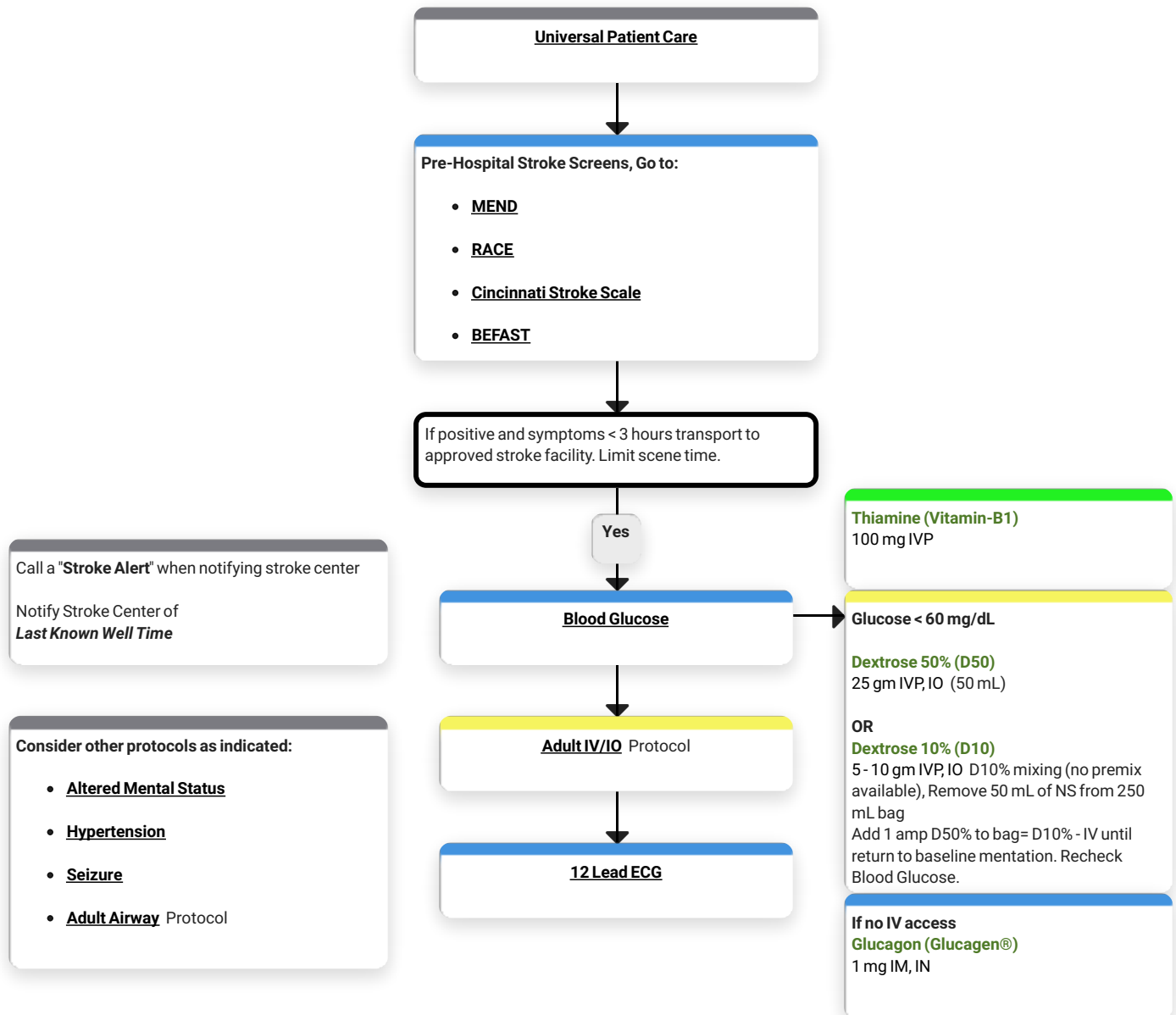
DIFFERENTIAL:

- CNS trauma
- Tumor
- Metabolic, hepatic, renal failure
- Hypoxia
- Electrolyte abnormality
- Drugs, meds, non-compliance
- Infection/fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

PEARLS:

- **Exam:** Mental status, HEENT, heart, lungs, extremities, neuro
- Status Epilepticus
 - 2 successive seizures without a period of consciousness or recovery
- Grand mal
 - Generalized
 - LOC
 - Incontinence
 - Tongue trauma
- Focal seizures (petit mal)
 - Only a part of the body affected and not associated with LOC
- Jacksonian seizures
 - Focal seizures that become generalized
- Be prepared for airway problems and continued seizures
- Assess for occult trauma and substance abuse
- Be prepared to assist ventilation if midazolam is used
- Seizures in pregnant patient: follow OB Emergency Protocol
- Thiamine may be omitted in patients who do not appear malnourished

Suspected Stroke



Suspected Stroke - Medical Reference

HISTORY:

- Previous CVA, TIA
- Previous cardiac, vascular surgery
- Diabetes, HTN, CAD
- Afib
- Medications (blood thinners)
- Trauma?

SIGNS and SYMPTOMS:

- Altered mental status
- Weakness/paralysis
- Blindness or sensory loss
- Aphasia/dysarthria
- Syncope
- Vertigo/dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hyper/Hypotension

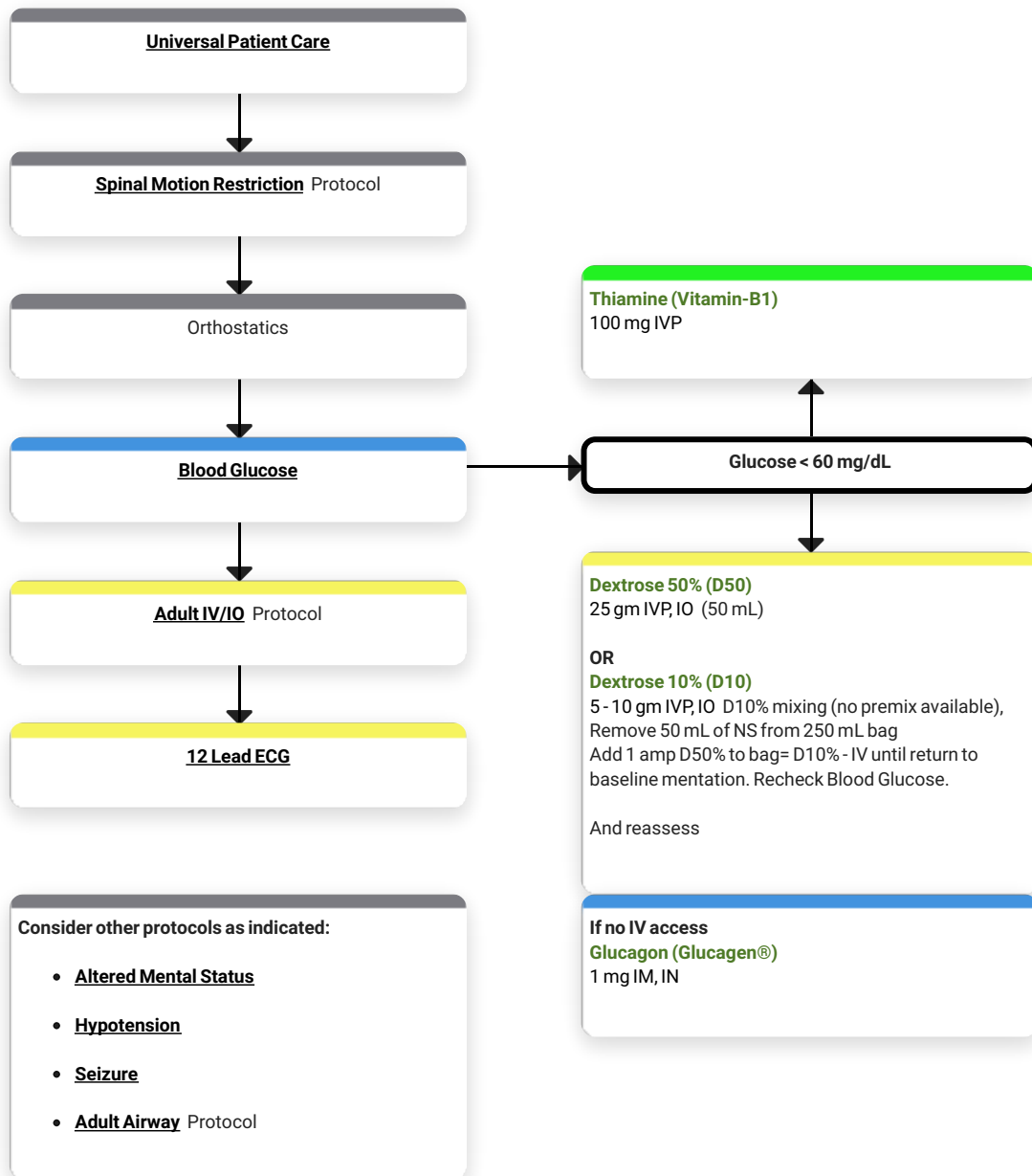
DIFFERENTIAL:

- See altered mental status
- TIA
- Seizure
- Hypoglycemia
- CVA
- Tumor
- Trauma

PEARLS:

- **Exam:** Mental status, HEENT, heart, lungs, abdomen, extremities, neuro
- Minimize scene/transport time.
- Onset of symptoms - last witnessed time the patient was symptom-free
- Monitor for airway problems (swallowing, vomiting)
- Always assess for hypoglycemia
- Patients not malnourished do not require Thiamine
- Document RACE score
- Document 12-Lead ECG

Syncope



Syncope - Medical Reference

HISTORY:

- Cardiac
- CVA
- Seizures
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss, N/V/D
- Past medical history
- Medications

SIGNS and SYMPTOMS:

- LOC with recovery
- Light-headedness, dizzy
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Low blood pressure

DIFFERENTIAL:

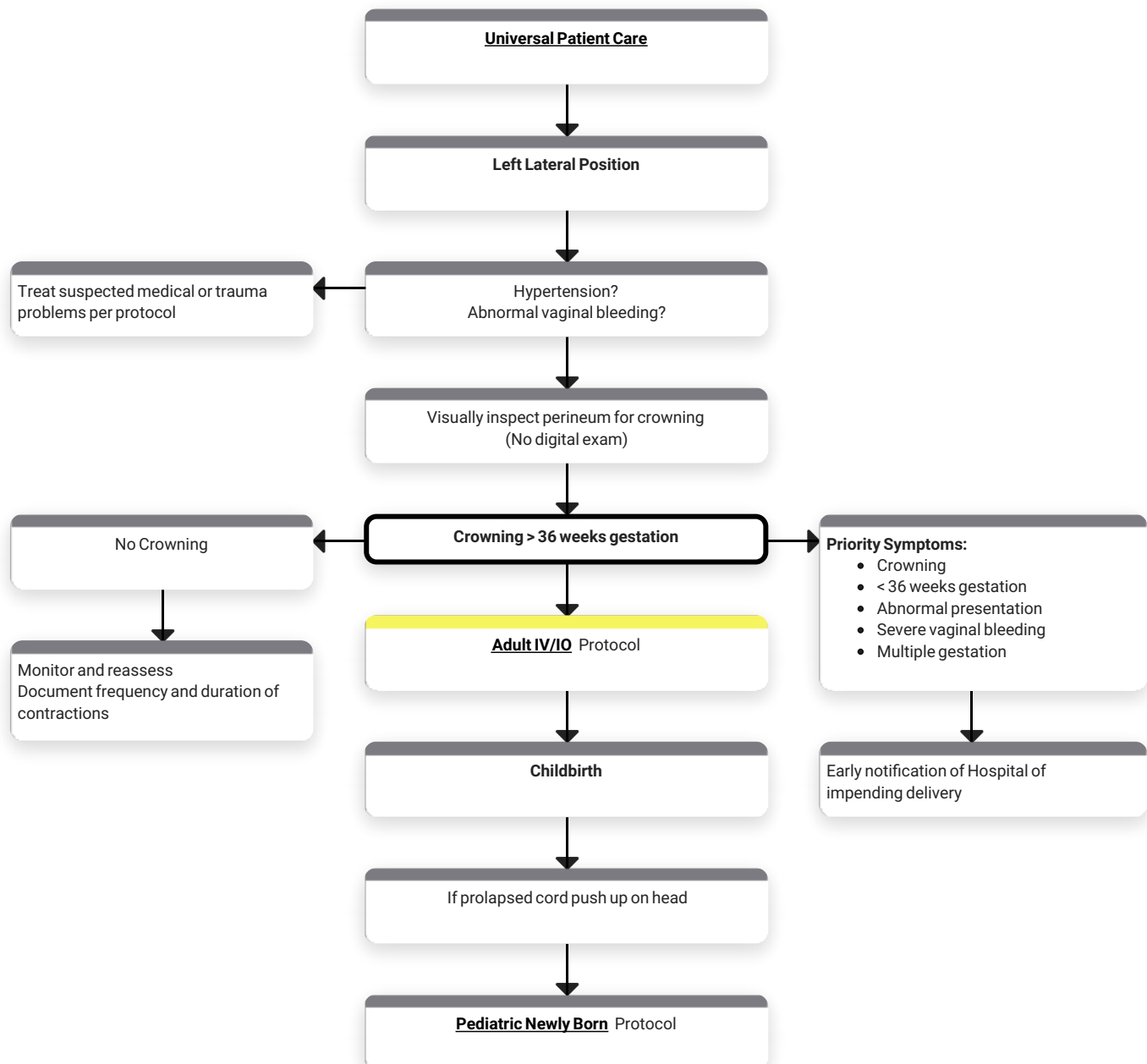
- Vasovagal
- Orthostatic hypotension
- Cardiac
- Micturition/defecation syncope
- Psychiatric
- CVA
- Hypoglycemia
- Seizure
- PE
- Shock
- Toxicologic
- Medication effect

PEARLS:

- **Exam:** Mental status, skin, HEENT, heart, lungs, abdomen, extremities, neuro
- Assess for trauma
- Consider dysrhythmias, GI bleed, ectopic pregnancy, seizure as causes of syncope
- Omit thiamine in patients who are not malnourished
- More than 25% of geriatric syncope is cardiac dysrhythmia related

Adult OB/GYN

Childbirth/Labor



Childbirth/Labor - Medical Reference

HISTORY:

- Due date
- Time contractions started/how often
- Rupture of membranes
- Time/amount of vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Drug use
- Gravida/para status
- High-risk pregnancy?

SIGNS and SYMPTOMS:

- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

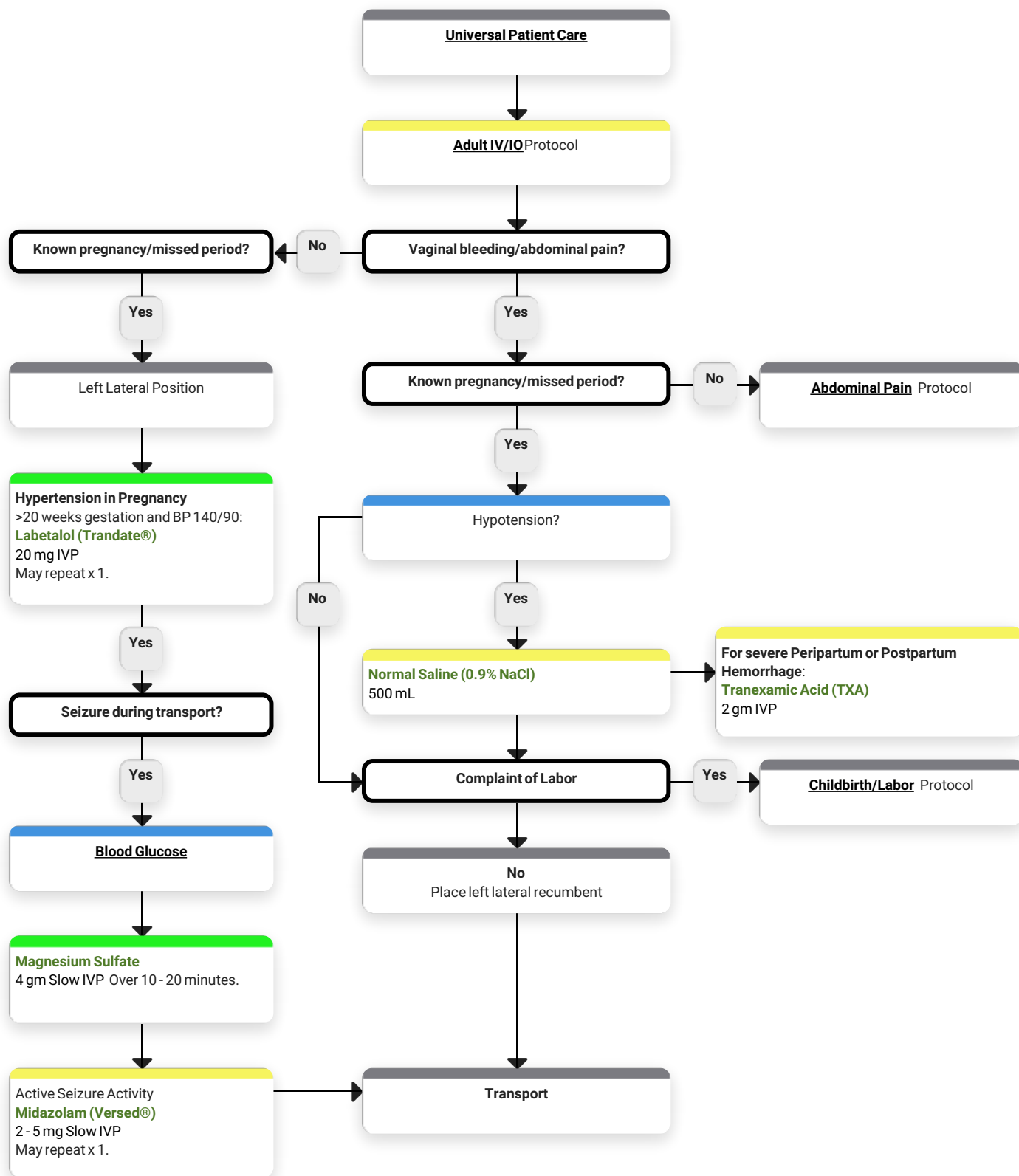
DIFFERENTIAL:

- Abnormal presentation
- Buttock
- Foot
- Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta

PEARLS:

- **Exam (mother):** Mental status, heart, lungs, abdomen, neuro
- Document at all times (deliver, contractions frequency/length)
- Transport: Mother may lay in position of comfort if not fetal distress present; Preferred position is left lateral decubitus
- After delivery - massage uterus (lower abdomen) which will promote uterine contraction to control postpartum bleeding
- Some perineal bleeding is normal with childbirth, large quantities or free bleeding is abnormal
- Record APGAR at 1 and 5 minutes after birth

Obstetrical Emergency



Obstetrical Emergency - Medical Reference

HISTORY:

- Past medical history
- Hypertensive meds
- Prenatal care
- Prior pregnancies
- G/P

SIGNS and SYMPTOMS:

- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Headache
- Visual changes
- Facial/hand edema

DIFFERENTIAL:

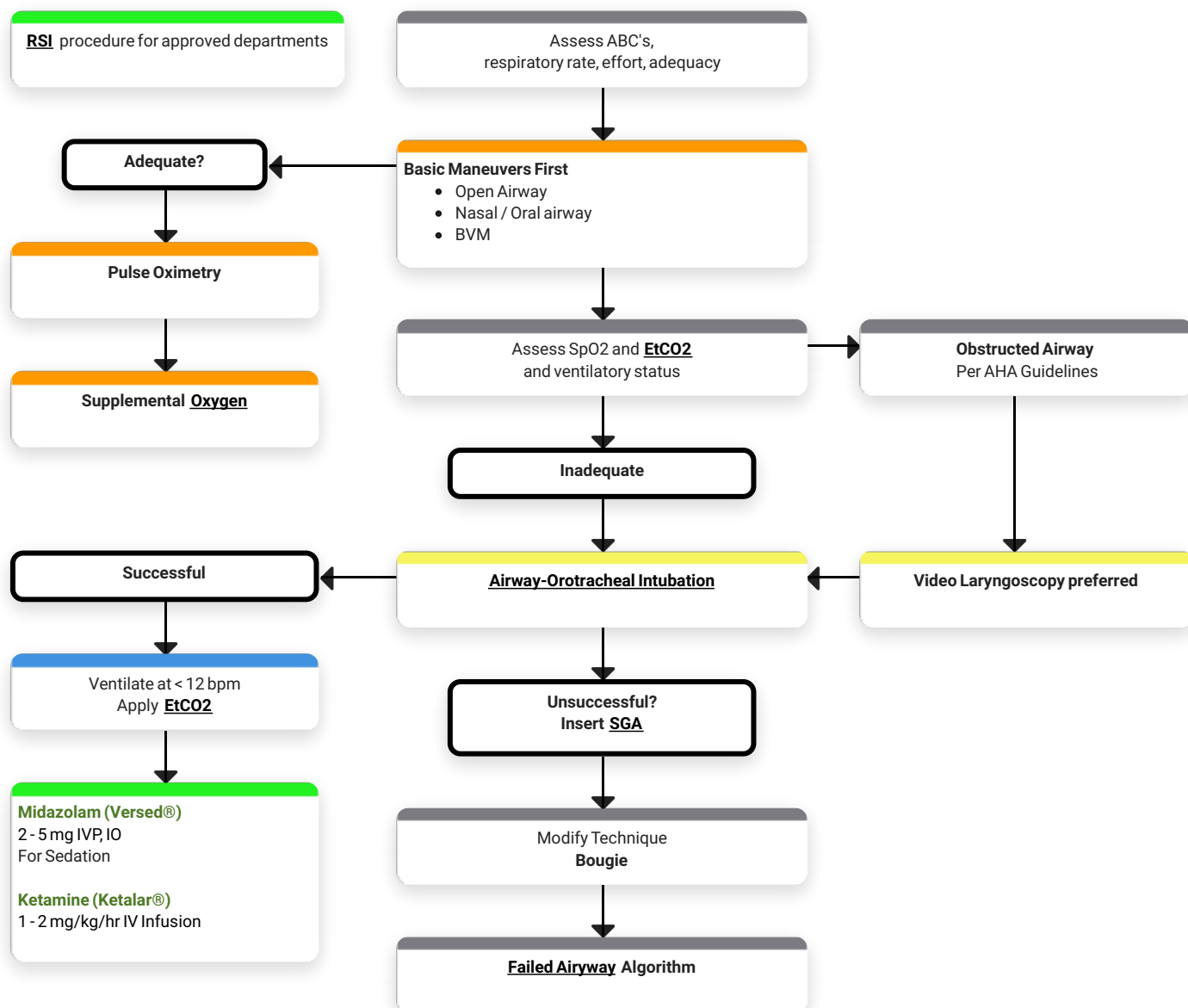
- Pre-eclampsia/eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion

PEARLS:

- **Exam:** Mental status, abdomen, heart, lungs, neuro
- Severe headache, vision changes, RUQ pain may indicate pre-eclampsia
- In pregnancy, HTN = BP > 140/90
- Maintain patient in left lateral position to minimize risk of supine hypotensive syndrome
- Quantify bleeding = number of pads per hour
- Any pregnant patient in MVC should be seen by physician for evaluation and fetal monitoring
- Magnesium, in high doses (i.e. 6 grams), may cause hypotension and decreased respiratory drive. Use cautiously.

Adult Respiratory

Adult Airway



Adult Airway - Medical Reference

PEARLS:

- For this protocol, Adult > 12 years old
- Capnometry is mandatory with all methods of intubation. Document results.
- **WAVEFORM CAPNOGRAPHY MANDATORY FOR ALL ADVANCED AIRWAYS (iGEL, ETT)**
- Do not assume hyperventilation is psychogenic - use oxygen
- ELM = External Laryngeal Manipulation
- Use SGA = Supraglottic airway (iGel) when unable to intubate a patient. Avoid hypoxemia
- In head trauma, maintain EtCO₂ 35-45. Avoid overventilation. Avoid hypoxemia
- Utilize continuous pulse oximetry
- Bougie may be used on any attempt based on initial assessment

Adult Rapid Sequence Intubation (RSI) Procedure

Paramedic

Clinical Indications:

- **RSI Checklist—ADULTS RESUSCITATE BEFORE YOU INTUBATE**

Procedure

☐ 1. Pull ambulance to stop if safe to do so; all personnel assisting

☐ 2. Optimize positioning 30 degree head up, collar off

☐ 3. Denitrogenate / Oxygenate (NRB/CPAP/BVM with peep)

☐ 4. Monitors mandatory: NIBP, SPO2, EtCO2, ECG

☐ 5. Access: **2 reliable IV sites preferable** or **IO**

☐ 6. Suction: On and tested with Ducanto attached.

☐ 7. Equipment: "Kit dump"

☐ Video/Direct Laryngoscope on and tested

☐ Tubes, Stylet, OPA, Tube tie

☐ Failed airway equipment at bedside (Bougie, cric kit, **SGA***)

☐ 8. **Meds: Induction**

☐ Normotensive =

Ketamine (Ketalar®) (50 mg/mL)

2 mg/kg IVP

Maximum dose 200 mg (4 mL)

☐ Hypotensive =
Ketamine (Ketalar®) (50 mg/mL)
0.5 mg/kg IVP
Maximum dose 50 mg (1 mL)

☐ 2nd Choice
Etomidate (Amidate™) (2 mg/mL)
0.3 mg/kg IVP, IO
Maximum dose 30 mg (15 mL)

☐ 9. Meds: Paralysis

☐ Normotensive =
Rocuronium (Zemuron™)
100 mg IVP, IO

☐ Secondary Option=
Succinylcholine (Anectine®) (20 mg/mL)
1.5 - 2 mg/kg IVP

☐ 10. Meds: Post-Intubation

☐ **Fentanyl (Sublimaze®)**
100 mcg IVP, IO
Maximum 200 mcg

AND

☐ **Midazolam (Versed®)**
2.5 - 5 mg IVP, IO

OR

☐ If IV Infusion Pump or Dial-A-Flow available:
Ketamine (Ketalar®)
1 - 2 mg/kg/hr IV Infusion

OR

☐ **Rocuronium (Zemuron™)**
100 mg IVP, IO May repeat x 1.

☐ **Atropine**
0.4 mg IVP, IO For excessive salivation due to Ketamine

☐ 11. For peri-intubation hypotension

☐ **Epinephrine Push Dose**
10 - 20 mcg IVP Mix 1 mL Epinephrine (1 mg/10 mL) with 9 mL Normal Saline and mix syringe

Administer every 3 minutes until MAP >65

Adult Rapid Sequence Intubation (RSI) Checklist

Delayed Sequence Intubation:

Indication: Hypoxia/Hypotension prior to intubation

Procedure: Use CPAP PLUS Nasal cannula at 15 lpm, while addressing Hypoxia/Hypotension

Apneic Oxygenation:

Add nasal cannula with 15 lpm oxygen during procedure in addition to BVM

Epinephrine Push Dose-DSI (peri-intubation hypotension)

Draw up 1 ml of Cardiac Epi 1 mg/10 ml.

Each 0.1 ml = 10 mcg epinephrine

Dosing 10-20 mcg every 3-5 min until MAP >65 achieved

Ideal Body Weight Calc:

Males: = 50 kg + 2.3 kg for each

inch over 5 feet

Females: = 45.5 kg + 2.3 kg for each

inch over 5 feet

Note: Rocuronium is NOT a sedative, patients given rocuronium must have adequate sedation and a secured airway.

PARAMEDIC

RSI Checklist—ADULTS

**RESUSCITATE BEFORE YOU INTUBATE

**Pull ambulance to stop if safe to do so; all personnel assisting

**Optimize positioning 30 degree head up, collar off

**Denitrogenate/Oxygenate (NRB/CPAP/BVM with peep)

**Monitors mandatory: NIBP, SpO₂, EtCO₂, ECG

**Access: 2 reliable IV sites preferable

**Suction: On and tested

**Equipment: "Kit dump"

- Video/Direct Laryngoscope on and tested
- Tubes, Stylet, OPA, Tube tie
- Failed airway equipment at bedside (Bougie, cric kit, SGA*)

Meds: Induction

Normotensive =

Ketamine (Ketalar®) (50 mg/mL)

2 mg/kg IVP

Maximum dose 200 mg (4 mL)

Hypotensive =

Ketamine (Ketalar®) (50 mg/mL)

0.5 mg/kg IVP

Maximum dose 50 mg (1 mL)

2nd Choice

Etomidate (Amidate™) (2 mg/mL)

0.3 mg/kg IVP, IO

Maximum dose 30 mg (15 mL)

Meds: Paralysis

Normotensive =

Rocuronium (Zemuron™)

100 mg IVP, IO

Secondary Option=

Succinylcholine (Anectine®) (20 mg/mL)

1.5 - 2 mg/kg IVP

Meds: Post Intubation

Fentanyl (Sublimaze®)

100 mcg IVP, IO

Maximum 200 mcg

AND

Midazolam (Versed®)

2.5 - 5 mg IVP, IO

OR

If IV Infusion Pump or Dial-A-Flow available:

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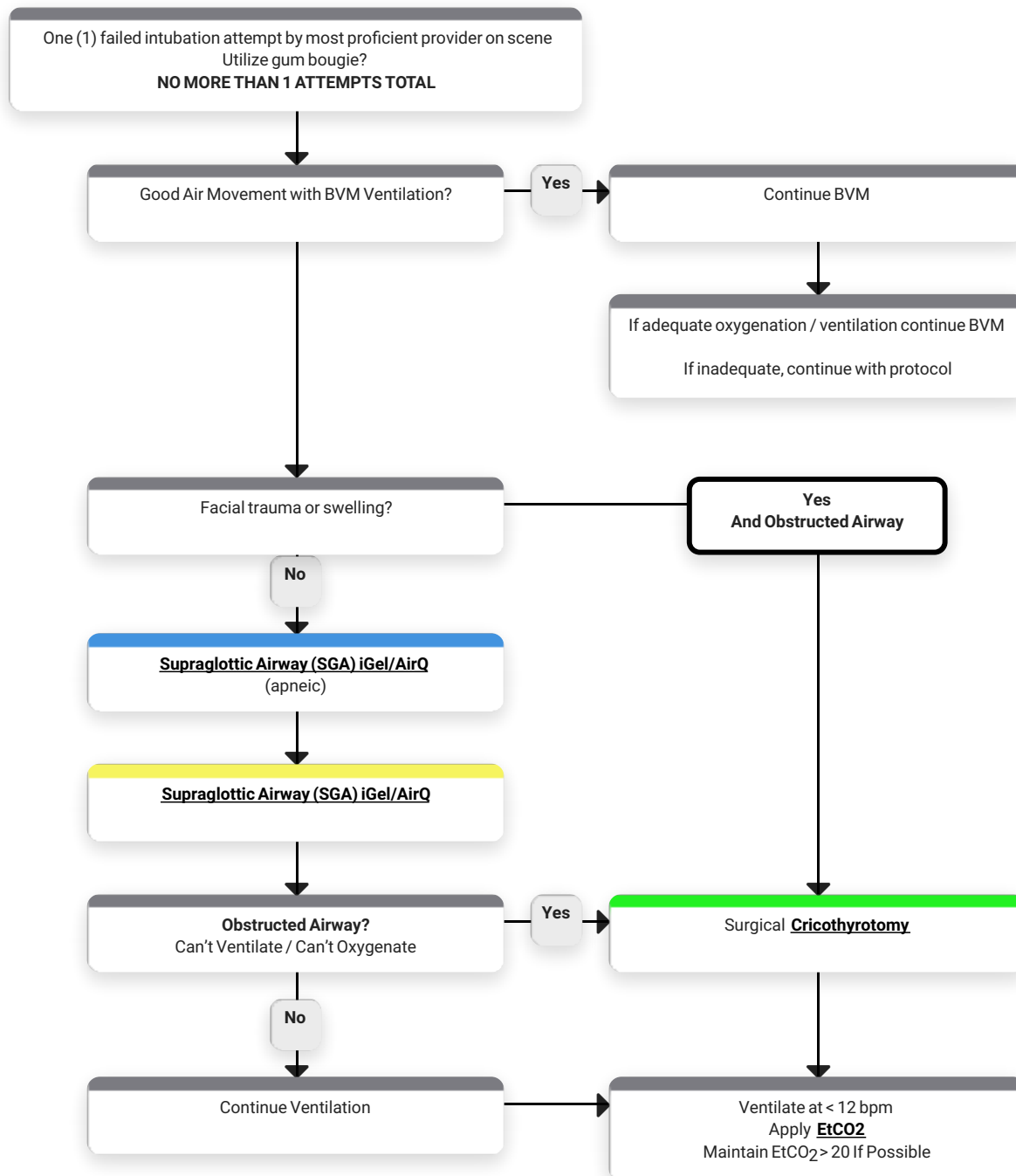
Administer every 3 minutes until MAP >65

Adult Rapid Sequence Intubation (RSI) Checklist - Medical Reference

PEARLS

- Avoid Succinylcholine in the following: Burns/severe trauma >24 hours (rhabdomyolysis; Hyperkalemia; Hx of Malignant hyperthermia; Pseudocholinesterase disorder; Ocular trauma
- Prepare all equipment. Anticipate difficult airway. Have rescue device at hand.
- Consider use of Bougie
- Confirm placement with capnometry
- Provide adequate sedation/analgesia once ETT in place
- Immobilize the neck during transport to avoid dislodgement of ETT
- *SGA = SupraGlottic Airway

Airway-Failed

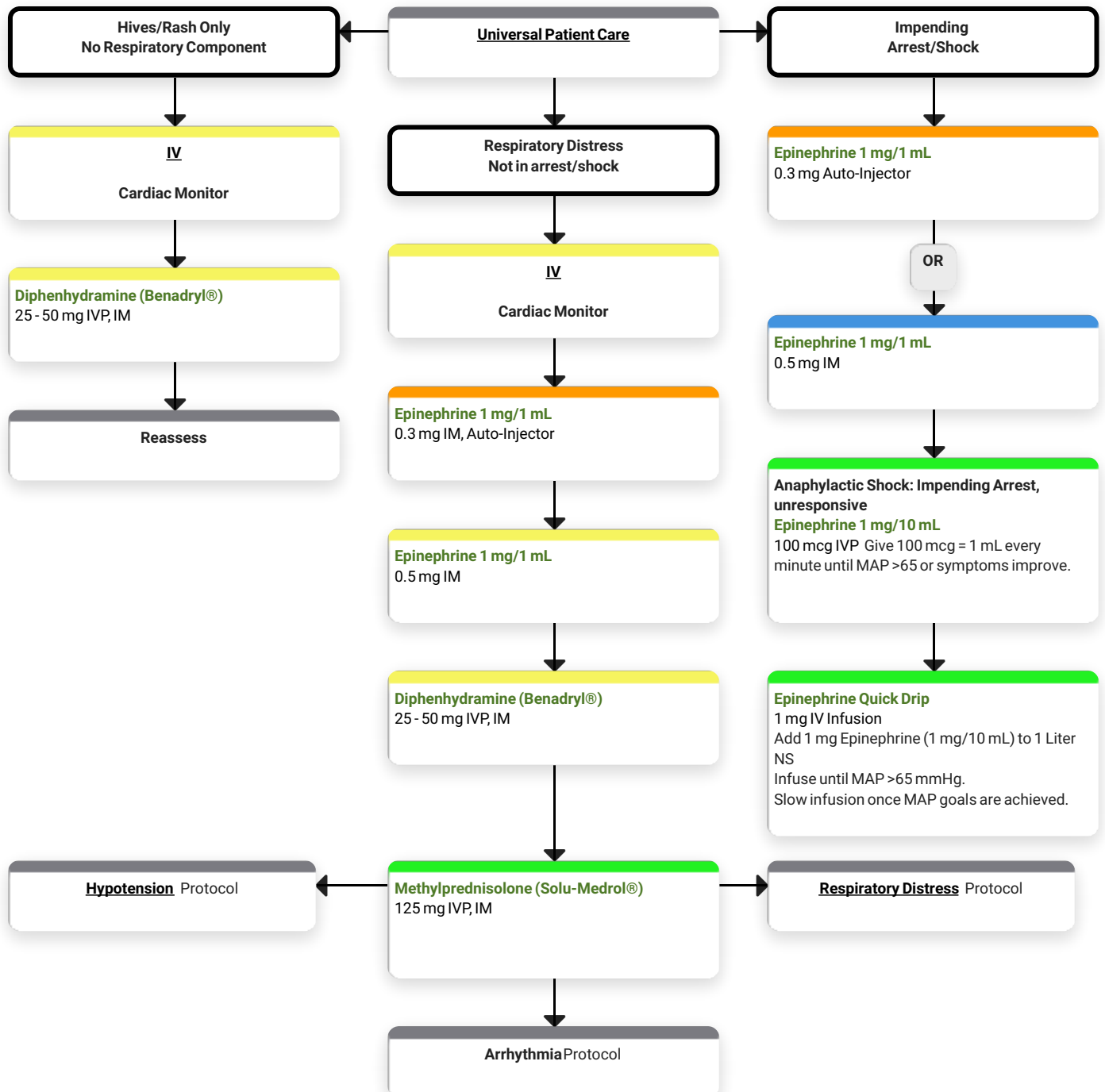


Airway-Failed - Medical Reference

PEARLS:

- Continuous Pulse Oximetry should be used in all patients with inadequate respiratory function
- Continuous EtCO₂ should be applied to all patients with respiratory failure and to all intubated patients
- Providers should consider using a King airway when unable to intubate a patient
- AEMT's and EMT's may use the SGA only after attending approved in-service and completing practical examination
- Notify OLMC as soon as possible about failed airway.
 - MEDICAL DIRECTOR MUST BE CONTACTED WITHIN 24 HOURS TO DEBRIEF FAILED AIRWAY
- Patient must have respiratory effort to perform naso-tracheal intubation

Allergic Reaction



Allergic Reaction - Medical Reference

HISTORY:

- Onset/location
- Insect sting or bite
- Food allergy/exposure
- Medication allergy/exposure
- New clothing, soap
- Past history
- Medication history

SIGNS and SYMPTOMS:

- Itching/hives
- Coughing/wheezing/respiratory distress
- Chest or throat tightening
- Difficulty swallowing
- Hypotension/shock
- Edema

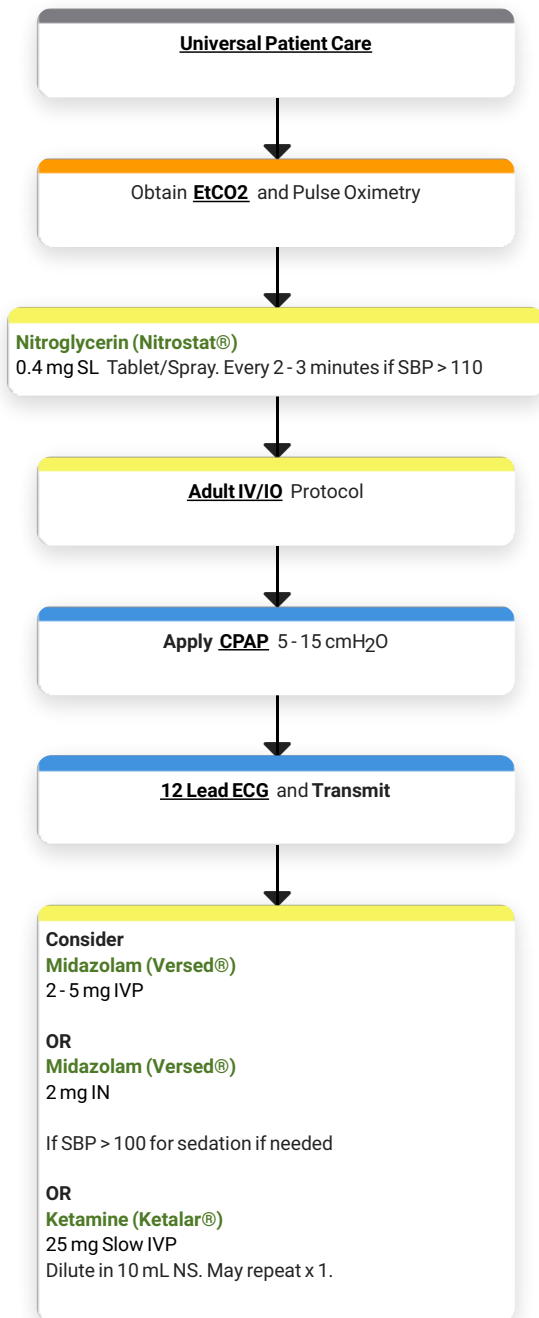
DIFFERENTIAL:

- Urticaria
- Anaphylaxis
- Shock
- Angioedema
- Aspiration
- Vasovagal
- Asthma/COPD
- CHF

PEARLS:

- **Exam:** Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Epinephrine may precipitate cardiac ischemia.
 - Use caution when giving EPI to patients greater than 50 years old.
- Perform ECG.
- Shorter the onset = more severe the reaction

Pulmonary Edema



Pulmonary Edema - Medical Reference

HISTORY:

- CHF
- Past medical history
- Medications (digoxin, lasix)
- Viagra, Levitra, Cialis
- Cardiac history (i.e., MI)

SIGNS and SYMPTOMS:

- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- JVD
- Pink, frothy sputum (late sign)
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

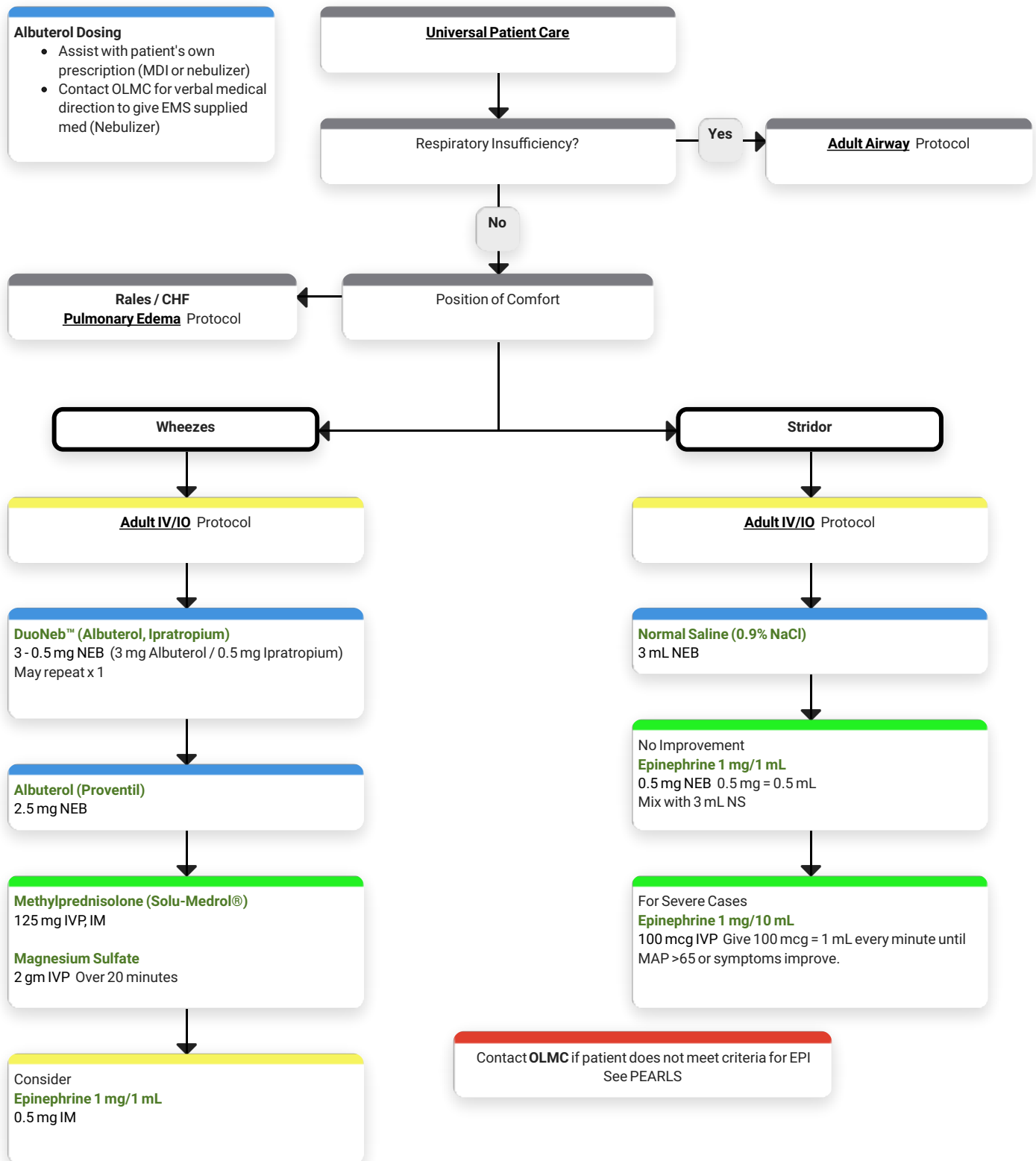
DIFFERENTIAL:

- MI
- CHF
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion/pneumonia
- PE
- Tamponade
- Toxic exposure

PEARLS:

- **Exam:** Mental status, skin, neck, heart, lungs, abdomen, back, extremities, neuro
- **Early aggressive treatment of pulmonary edema with nitrates and CPAP avoids intubation**
- Pre-hospital use of diuretics is no longer indicated
- Avoid Nitro in patient who has used Viagra or Levitra in past 24 hours or Cialis in past 36 hours
- Consider myocardial infarction in all of these patients (cardiogenic shock)
- Careful monitoring of LOC, BP, respiratory status with above interventions is essential
- Allow patient to remain in position of comfort to maximize breathing effort

Respiratory Distress



Respiratory Distress - Medical Reference

HISTORY:

- Asthma
- COPD
- CHF
- Home treatment (oxygen/nebulizer)
- Meds (theophylline, steroids, inhalers)
- Toxic exposure
- Smoke inhalation

SIGNS and SYMPTOMS:

- SOB
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi, rales, stridor
- Accessory muscle use
- Fever, cough, tachycardia

DIFFERENTIAL:

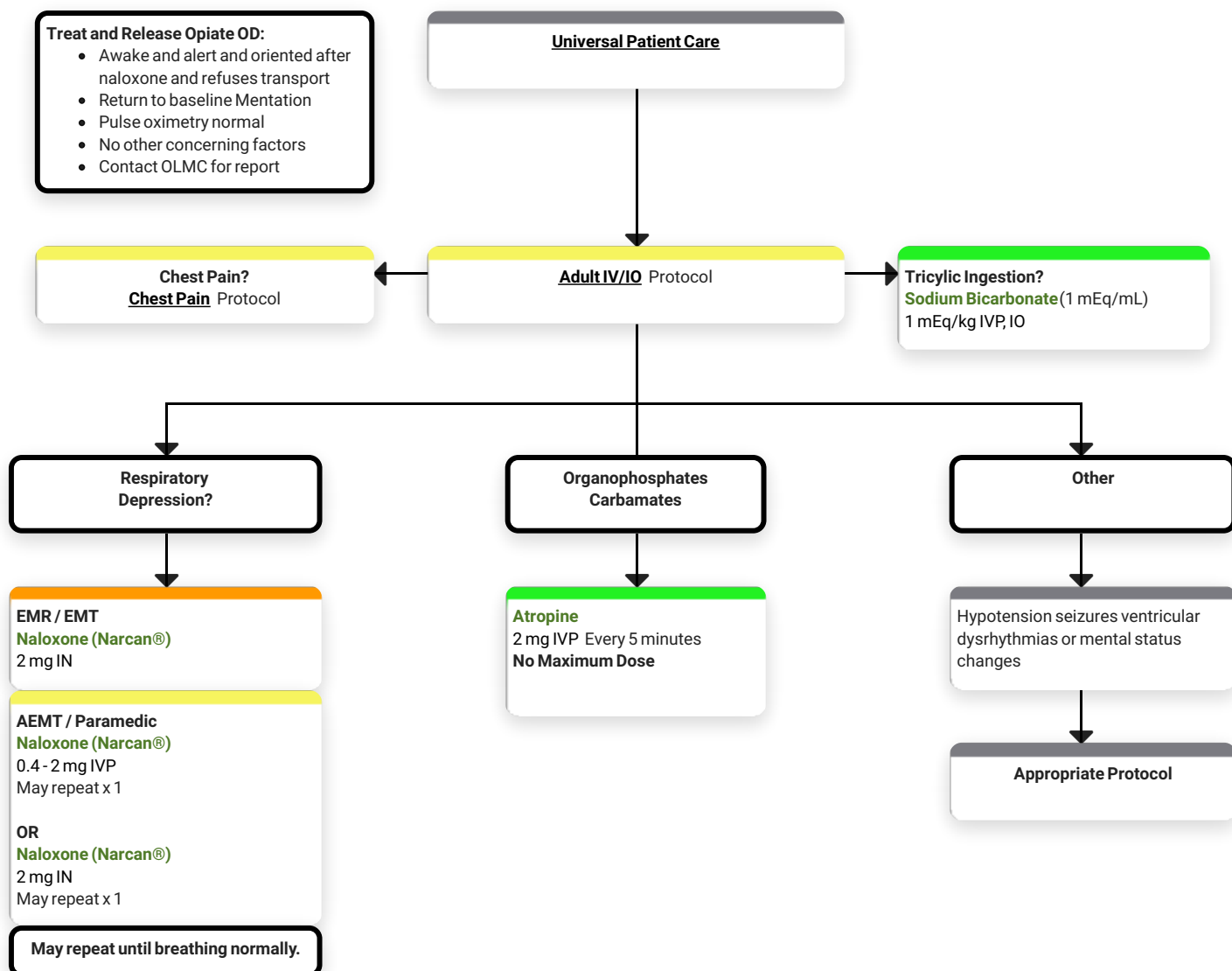
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pneumonia/pleural effusion
- Pneumothorax
- Cardiac (MI/CHF)
- PE
- Tamponade
- Hyperventilation
- Inhaled toxin

PEARLS:

- EMT's may assist patients with their own albuterol MDI
- Monitor pulse ox continuously - CPAP may be used for patients with COPD, CHF, Pneumonia, Asthma as per protocol
- Perform 12-lead ECG on these patients
- Monitor EtCO₂ continuously

Adult Toxicology

Overdose/Toxic Ingestion



Overdose/Toxic Ingestion - Medical Reference

HISTORY:

- Ingestion or suspected ingestion of toxic substance
- Substance ingested, quantity, route
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

SIGNS and SYMPTOMS:

- Mental status changes
- Hypotension/hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures

DIFFERENTIAL:

- TCA's
- Acetaminophen
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, alcohols, cleaning agents
- Insecticides (organophosphates)

PEARLS:

- **Exam:** Mental status, skin, HEENT, heart, lungs, abdomen, extremities, neuro
- Do not rely on patient history of ingestion in suicide attempt
- Bring bottles to ED
- TCA= tricyclic antidepressant: seizure, dysrhythmias, hypotension, decreased mental status, coma
- Acetaminophen: normal or N/V - causes irreversible liver failure if not detected
- Depressants: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- Stimulants: increased HR, increased BP, increased temperature, dilated pupils, seizures
- Anticholinergic: increased HR, increased temperature, dilated pupils, mental status change
- Cardiac meds: dysrhythmias, mental status changes
- Insecticides: increased/decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints per restraints procedures
- ALS units may transport patients who have received activated charcoal therapy

Opioid Overdose Sign Off

Below is the criteria in order to use the "Opioid Overdose Sign Off" Protocol

The following conditions must be true.

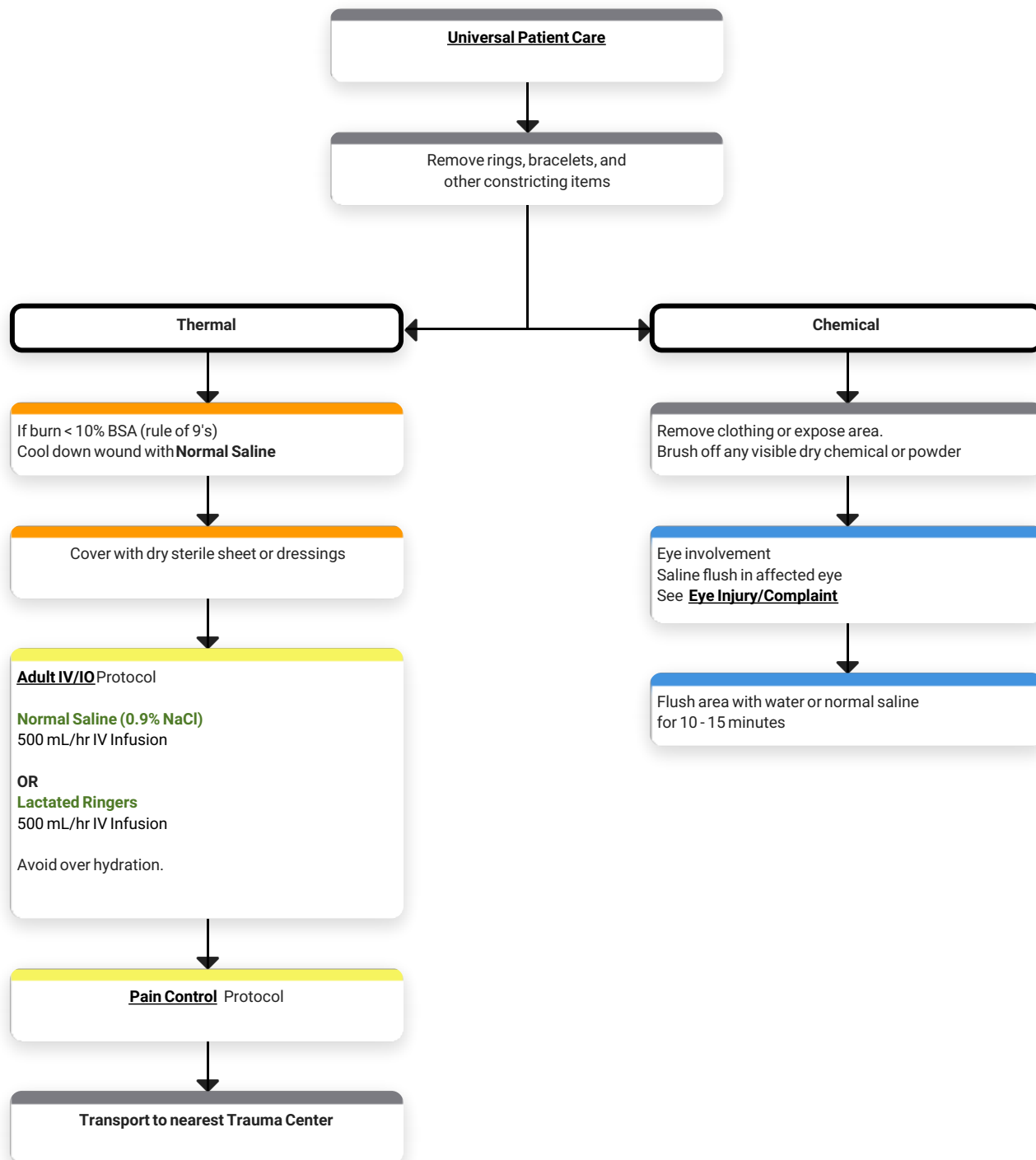
	YES	NO
A. The patient must never have been in cardiac arrest.	☐	☐
B. The patient must regain a normal mental and respiratory status after Naloxone (Narcan) administration of up to 4 mg via IM, IV, or IN route.	☐	☐
C. Once "awake", the patient must admit to isolated IV opioid/heroin overdose. Overdoses of Oxycontin and methadone are excluded.	☐	☐

If conditions A, B, and C are all met, and there is no other acute medical or traumatic condition requiring care, the patient is "medically clear" for consideration for alternate destination referral or the patient may sign a "refusal of care" from and refuse all further treatment and transport.

If the patient was ever in cardiac arrest, does not regain normal mental or respiratory status or requires more the 4 mg of Naloxone to do so, then the patient should be transported to an appropriate local emergency department. Transport to the Emergency Department should also be provided for patients who request it, and assistance should be provided to those patients who wish to be assessed and treated for substance abuse.

Adult Trauma

Burns



Burns - Medical Reference

HISTORY:

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other Trauma
- LOC

SIGNS and SYMPTOMS:

- Burns, pain, swelling
- Dizziness
- LOC
- Hypotension/shock
- Airway compromise/distress
- Singed facial or nasal hair
- Hoarseness or wheezing

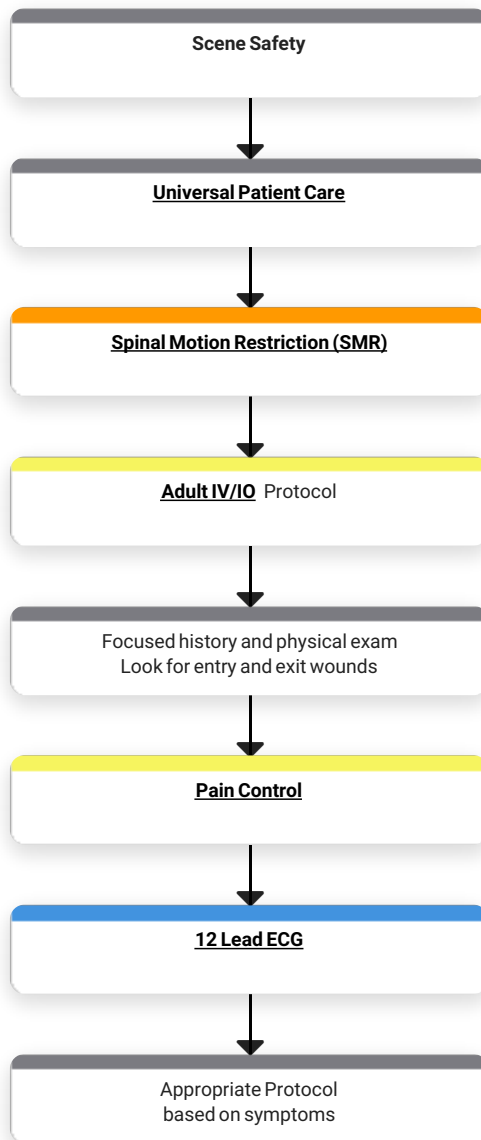
DIFFERENTIAL:

- Superficial (1st degree) - red and painful
- Partial thickness (2nd degree) - blistering
- Full thickness (3rd degree) - painless/charred leathery skin
- Chemical
- Thermal
- Electrical
- Radiation

PEARLS:

- **Exam:** Mental status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- **Critical Burns:** > 25% BSA; 3rd Degree burns > 10% BSA; 2nd or 3rd degree burns to face, eyes, hands or feet; electrical burns, respiratory burns, deep chemical burns, burns with extremes of age or chronic disease; burns associated with major traumatic injury.
 - These burns require admission or transfer to a burn center.
- Early intubation required in significant inhalation injuries
- Treat potential CO exposure with 100% Oxygen
- Circumferential burns to extremities are dangerous due to potential vascular compromise due to soft tissue swelling
- Burn patients are prone to hypothermia
- Do not overlook possibility of multi-system trauma
- Do not overlook possibility of child abuse.
- **NOTE:** the palm of the patient = 1% total BSA burned

Electrical Injuries



Electrical Injuries - Medical Reference

HISTORY:

- Lightning or electrical exposure
- Single or multiple victims
- Trauma from fall or MVC into pole
- Duration of exposure
- Voltage and current (AC/DC)

SIGNS and SYMPTOMS:

- Burns
- Pain
- Entry and exit wounds
- Hypotension or shock
- Arrest

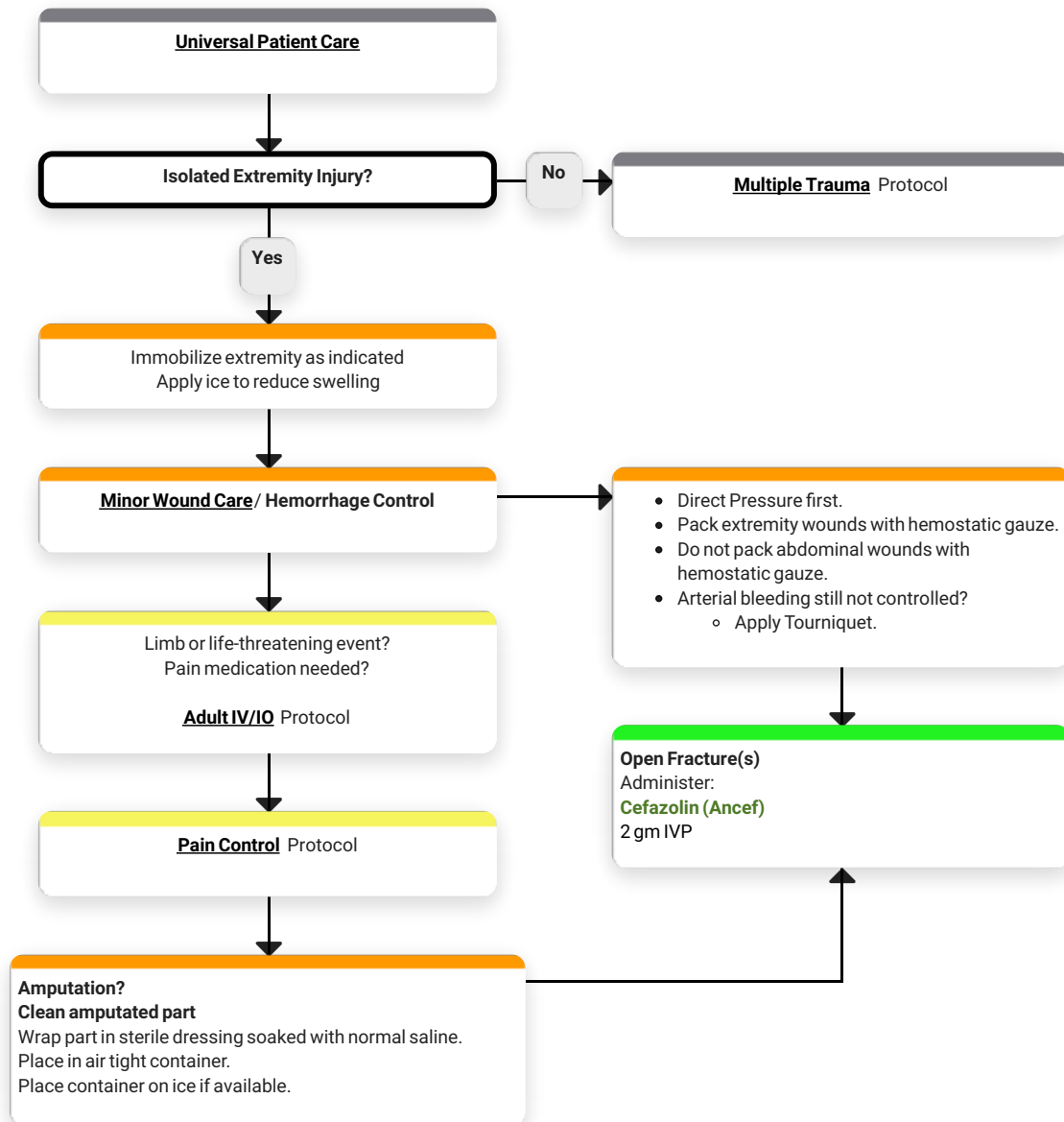
DIFFERENTIAL:

- Cardiac arrest
- Seizure
- Burns
- Multiple trauma

PEARLS:

- **Exam:** Mental status, HEENT, neck, heart, lungs, abdomen, extremities, back, neuro
- Ventricular fibrillation and asystole are most common dysrhythmias
- Damage often hidden - most severe damage to muscle, vessels, and nerves
- In multiple victim lightning incident, attend to victims in full arrest first. IF the victim did not arrest initially, it is likely they will survive. These patients are often resuscitated with adequate CPR and ALS
- Do not overlook other trauma
- Lightning is a massive DC shock, most often leading to asystole as the dysrhythmia
- In lightning injuries, most of the current will travel over the body surface producing flash burns

Extremity Trauma



Extremity Trauma - Medical Reference

HISTORY:

- Type of injury
- Mechanism: crush/penetrating/amputation
- Time of injury
- Open vs. Closed wound/fracture
- Wound contamination
- Medical history
- Medications

SIGNS and SYMPTOMS:

- Pain
- Swelling
- Deformity
- Altered sensation/motor function
- Diminished pulse/cap refill
- Decreased extremity temperature

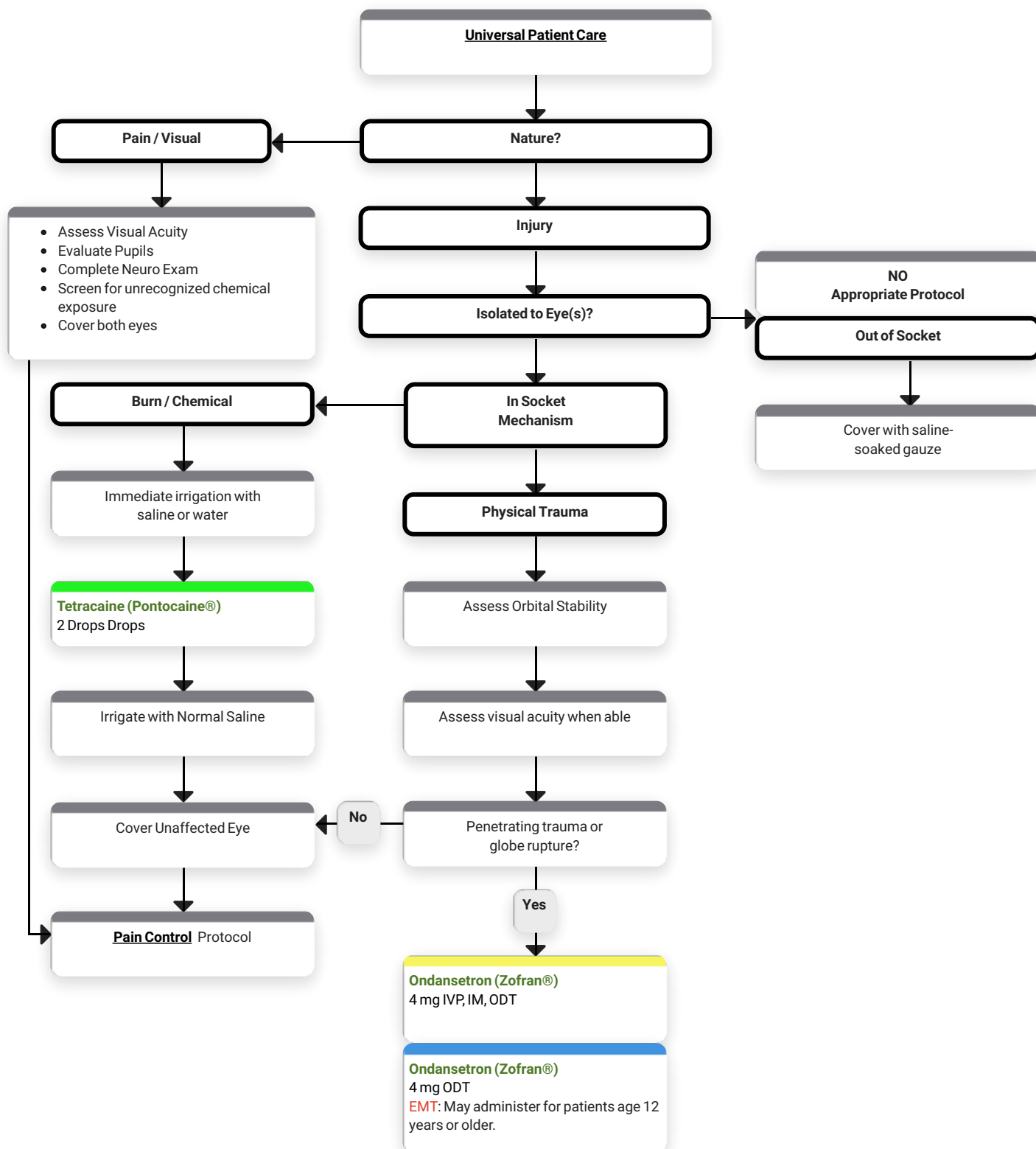
DIFFERENTIAL:

- Abrasion
- Confusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputations

PEARLS:

- **Exam:** Mental status, extremity, neuro
- In amputations, time is critical. Consider transport to Trauma center (see above note)
- Hip dislocation and knee and elbow fracture/dislocations have a high incidence of vascular compromise
- Urgently transport any injury with vascular compromise
- Blood loss may be concealed or not apparent with extremity injuries
- Severe bleeding not rapidly controlled may necessitate application of a tourniquet
- Lacerations must be evaluated for repair within 6 hours from the time of injury

Eye Injury/Complaint



Eye Injury/Complaint - Medical Reference

HISTORY:

- Time of injury/onset
- Blunt/penetrating/chemical
- Open vs. closed injury
- Involved chemical/MSDS
- Wound contamination
- Medical history
- Tetanus status
- Normal visual acuity
- Medications

SIGNS and SYMPTOMS:

- Pain, swelling, blood
- Deformity, contusion
- Visual deficit
- Leaking aqueous/vitreous humor
- Upwardly fixed eye
- Shooting or streaking light
- Visible contaminants
- Lacrimation

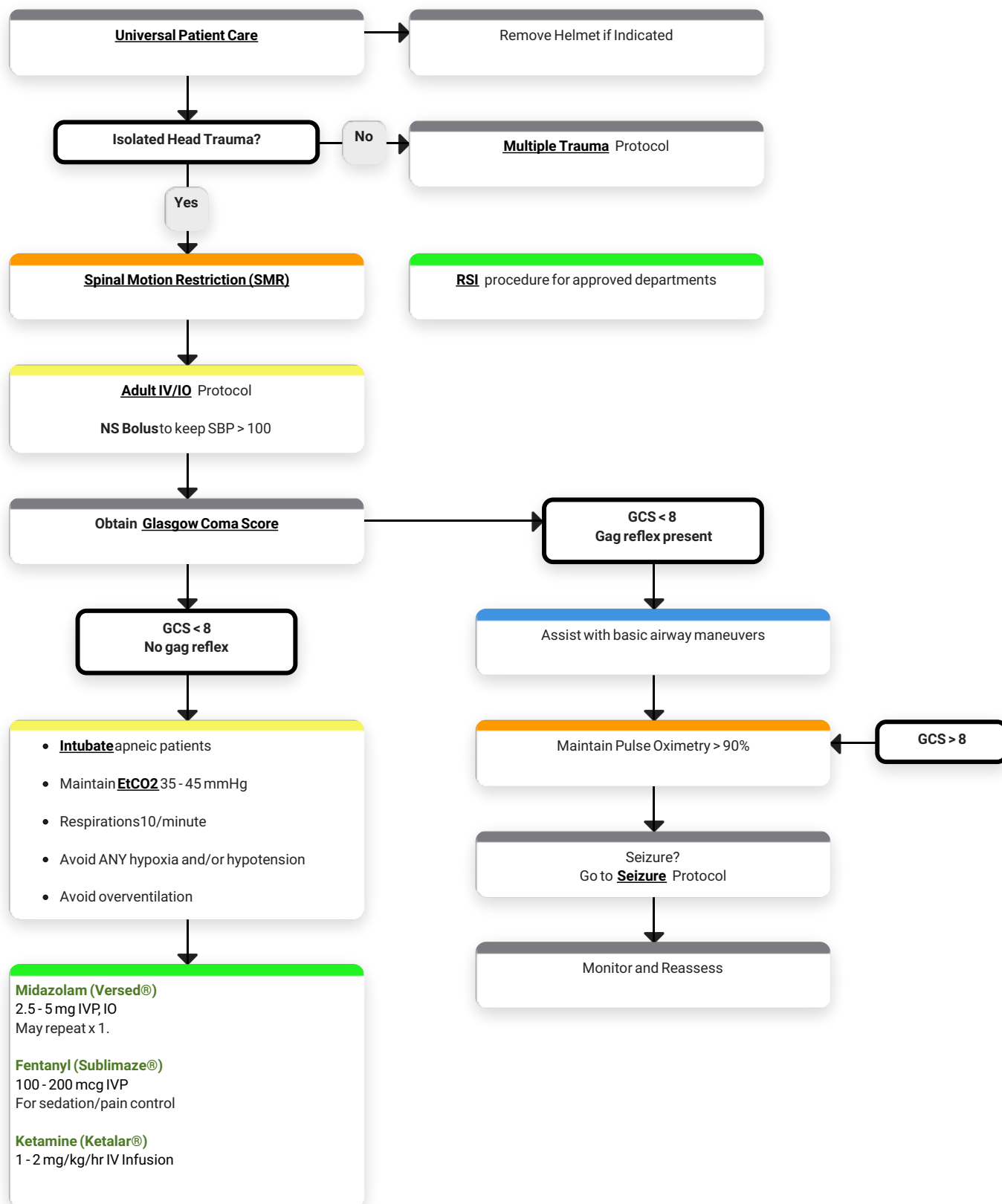
DIFFERENTIAL:

- Abrasion/laceration
- Globe rupture
- Retinal nerve damage detachment
- Chemical/thermal/agent of terror
- Orbital fracture
- Orbital compartment syndrome
- Neurological event
- Acute glaucoma
- Retinal artery occlusion

PEARLS:

- Normal visual acuity can be present even with severe eye injury
- Remove contact lenses when possible
- Any chemical or thermal burn to the face/eyes should raise suspicion of respiratory insult
- Orbital fractures raise concern of globe or nerve injury and need repeated assessments of visual status
- Should cover both eyes to prevent injury
- Use shields for physical trauma to eyes (not pads)
- Do not remove impaled objects

Head Trauma



Head Trauma - Medical Reference

HISTORY:

- Time of injury
- Mechanism: blunt/penetrating
- LOC
- Bleeding
- Medical history
- Medication
- Evidence of multi-trauma
- Helmet use/damage to helmet

SIGNS and SYMPTOMS:

- Pain
- Swelling
- Bleeding
- Altered mental status
- Unconsciousness
- Respiratory distress/failure
- Vomiting
- Significant MOI

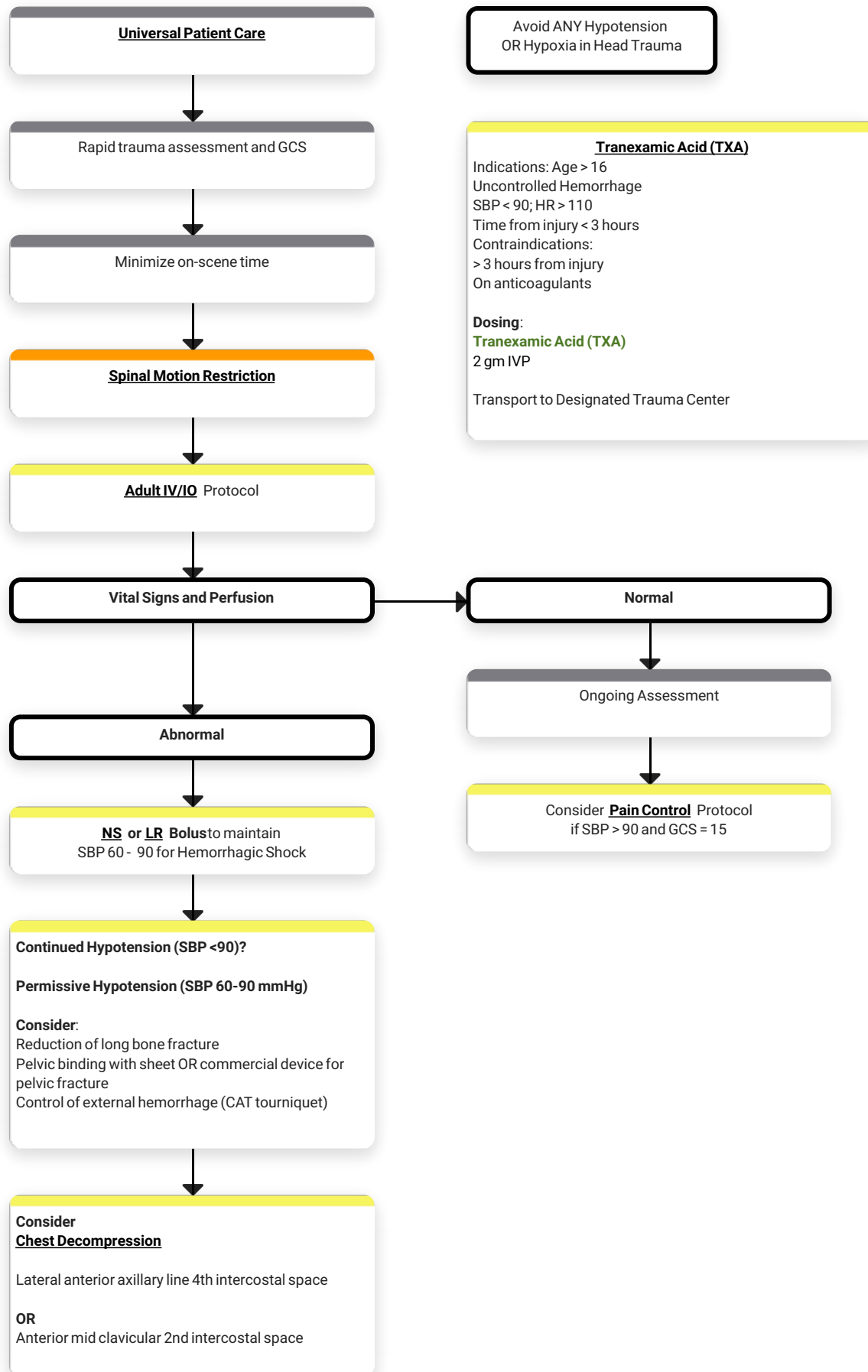
DIFFERENTIAL:

- Skull fracture
- Brain injury (concussion, contusion, hemorrhage, laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

PEARLS:

- **Exam:** Mental status, skin, HEENT, heart, lungs, abdomen, extremities, back, neuro
- **Cushing's Response:** Elevated ICP causing hypertension and bradycardia
- Hypotension usually indicates injury or shock unrelated to head injury and should be aggressively treated
- Monitor and document changes in LOC and GCS
- Consider restraints if necessary for safety of patient and/or personnel protection. DO NOT use Haldol
- Concussions are periods of confusion or LOC associated with trauma and may be resolved upon arrival of EMS
- Any prolonged period of confusion or mental status abnormality that does not return to normal within 15 minutes should be evaluated by a physician

Multiple Trauma



Multiple Trauma - Medical Reference

HISTORY:

- Time and MOI
- Damage to structure/vehicle
- Location in structure/vehicle
- Others injured/dead
- Speed and details of MVC
- Restraints/protective equipment
- Past medical history
- Medications

SIGNS and SYMPTOMS:

- Pain
- Swelling
- Altered mental status
- Unconscious
- Deformity
- Bleeding
- Hypotension/shock
- Arrest

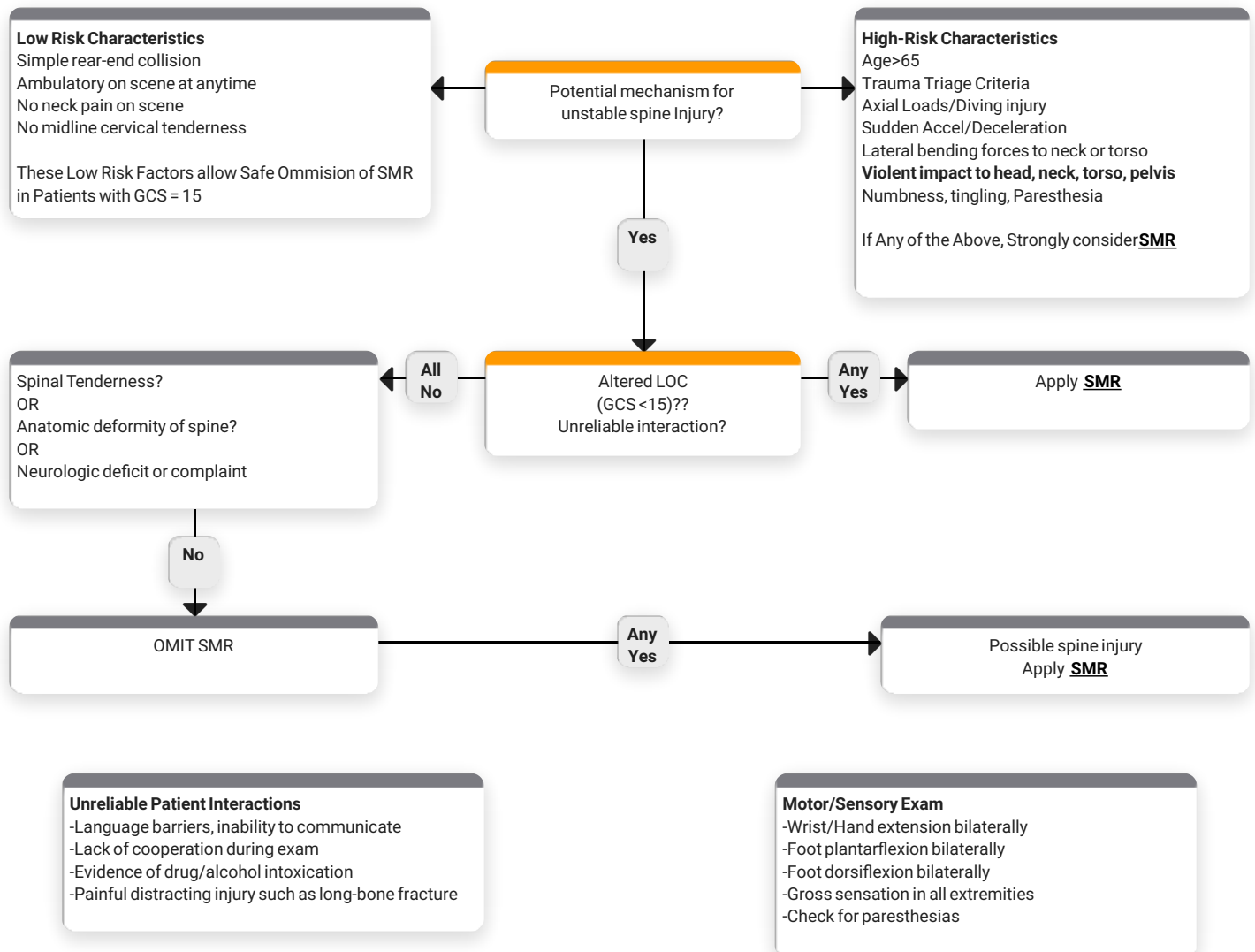
DIFFERENTIAL:

- Chest:
 - Tension pneumothorax
 - Flail chest
 - Pericardial tamponade
 - Open chest wound
 - Hemothorax
- Intra-abdominal bleeding
- Pelvis/femur fracture
- Spine fracture/cord injury
- Head injury
- Extremity fracture/dislocation
- Airway obstruction
- Hypothermia

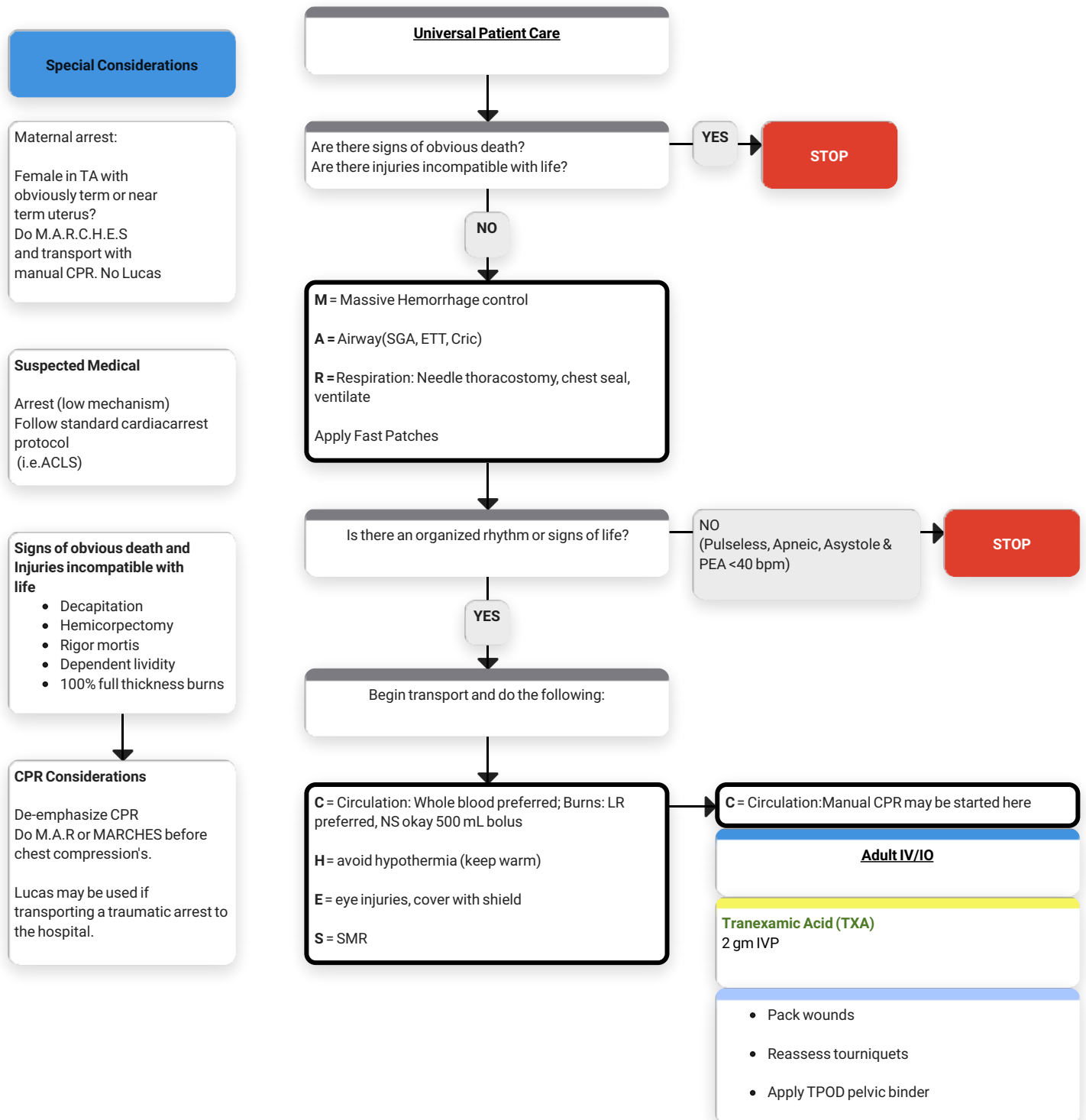
PEARLS:

- **Exam:** Mental status, HEENT, heart, lungs, abdomen, extremities, back, neuro
- In prolonged extrications/serious trauma, consider air transport
- Severe bleeding from an extremity not rapidly controlled may necessitate the application of a **TOURNIQUET**

Spinal Motion Restriction (SMR)



Trauma Arrest



Trauma Arrest - Medical Reference

History

- Patient who has suffered a traumatic injury and is now pulseless.

Signs and Symptoms

- Evidence of penetrating trauma.
- Evidence of blunt trauma.

Differential

- Medical condition preceding traumatic event as cause of arrest.
- Tension pneumothorax.
- Hypovolemic shock:
 - External hemorrhage.
 - Unstable pelvic fracture.
 - Displaced long bone fracture.
 - Hemothorax.
 - Intra-abdominal hemorrhage.
 - Retroperitoneal hemorrhage.

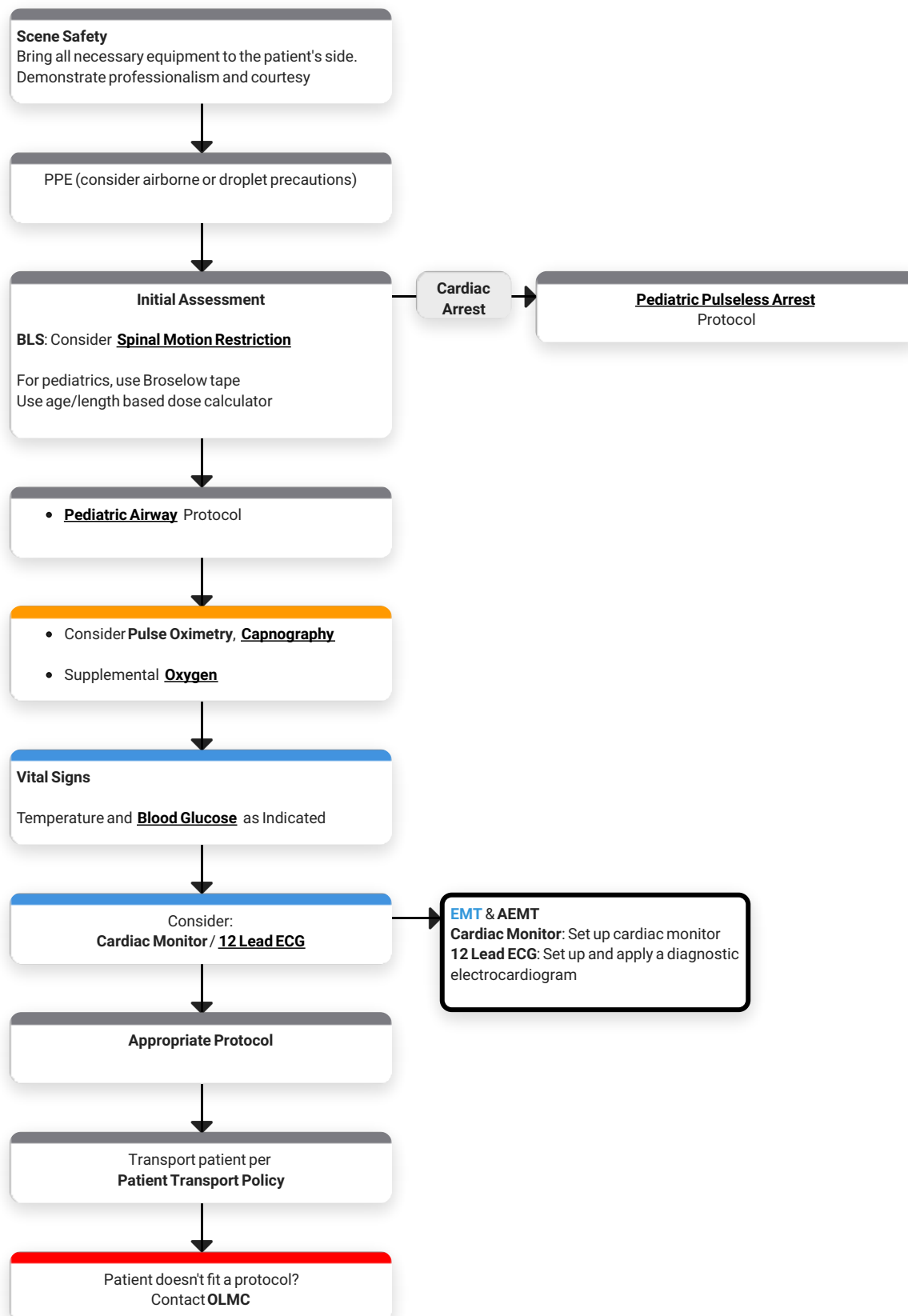
Pearls

- Injuries obviously incompatible with life include decapitation, massively deforming head or chest injuries or other features of a patient encounter that would make resuscitation futile. If in doubt, place patient on monitor.
- Consider using medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of arrest.

Pediatric Section

Pediatric Assessment

Pediatric Universal Care



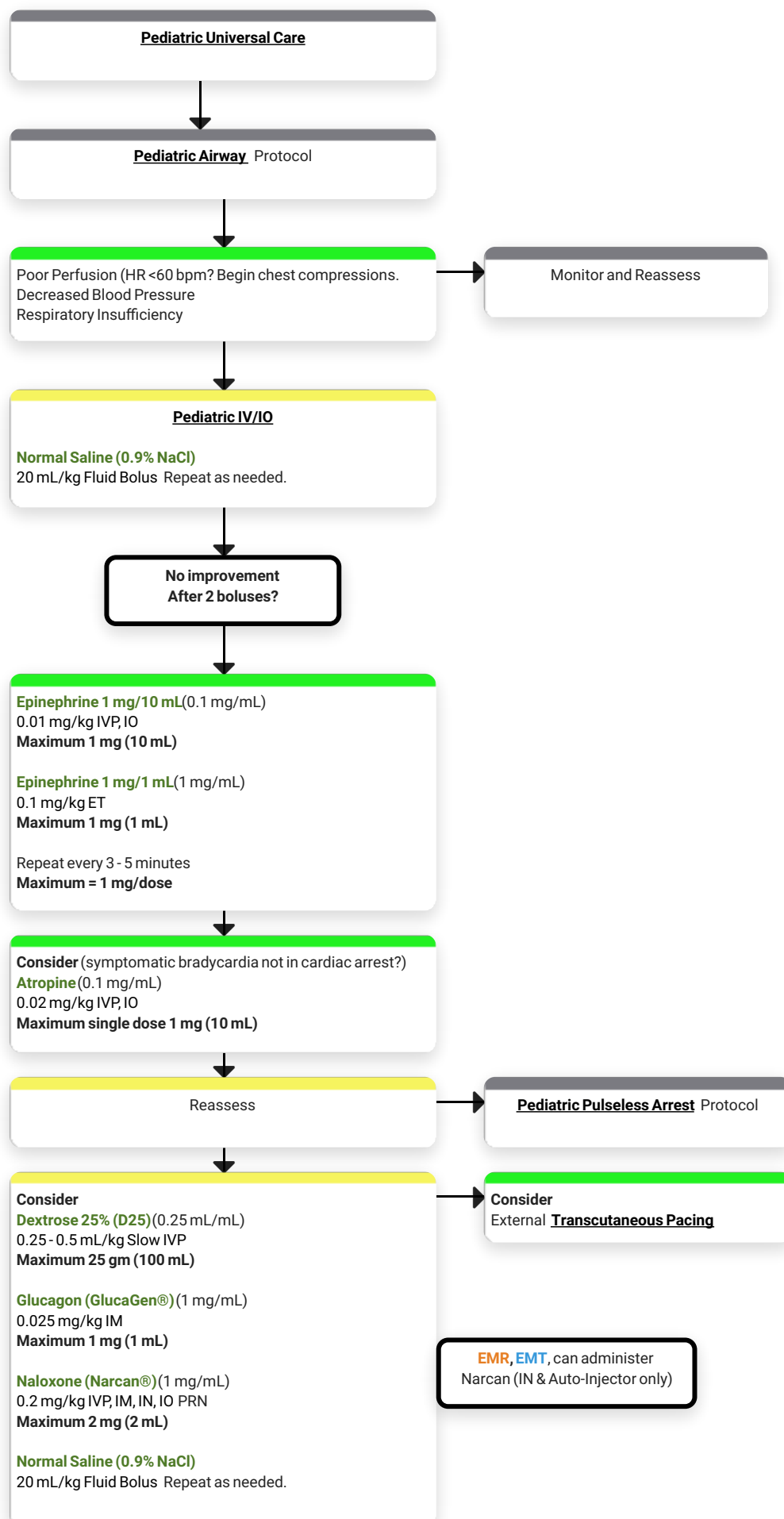
Pediatric Universal Care - Medical Reference

PEARLS:

- Any patient contact that does not result in transport requires documentation and disposition
- Required vital signs on every patient include BP, pulse, RR, pain/severity
- Pulse oximetry, glucose measurement and temperature documentation is dependent on complaint
- Timing of transport based on patient's clinical condition

Pediatric Cardiovascular

Pediatric Bradycardia



Pediatric Bradycardia - Medical Reference

HISTORY:

- Past medical history
- Foreign body?
- Respiratory distress or arrest
- Apnea
- Possible toxin exposure
- Congenital disease
- Medication (maternal or infant)

SIGNS and SYMPTOMS:

- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered LOC

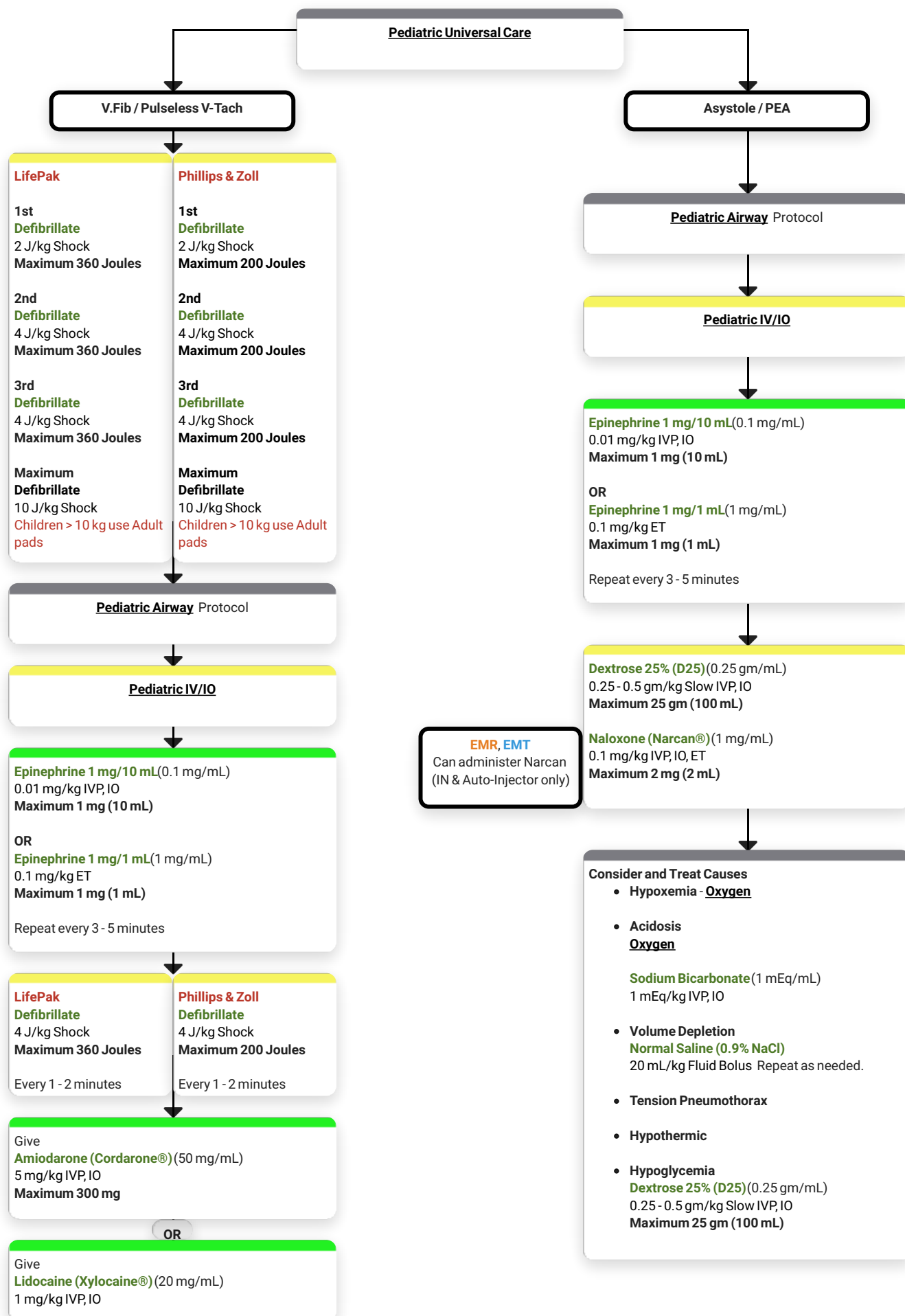
DIFFERENTIAL:

- Respiratory distress
- Foreign body
- Secretions
- Infection/sepsis
- Hypovolemia
- Congenital heart disease
- Trauma
- Hypothermia
- Toxin ingestion
- Hypoglycemia

PEARLS:

- **Exam:** Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neuro
- Infant = < 1 year of age
- Most maternal medications pass through breast milk to infant
- The majority of pediatric arrests are due to airway problems
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia
- Minimum Atropine dose is 0.1 mg IV/IO

Pediatric Pulseless Arrest



Pediatric Pulseless Arrest - Medical Reference

HISTORY:

- Time of arrest
- Medical history
- Medications
- Foreign body?
- Hypothermia?
- Suspected abuse?
- SIDS

SIGNS and SYMPTOMS:

- Unresponsive
- Cardiac arrest

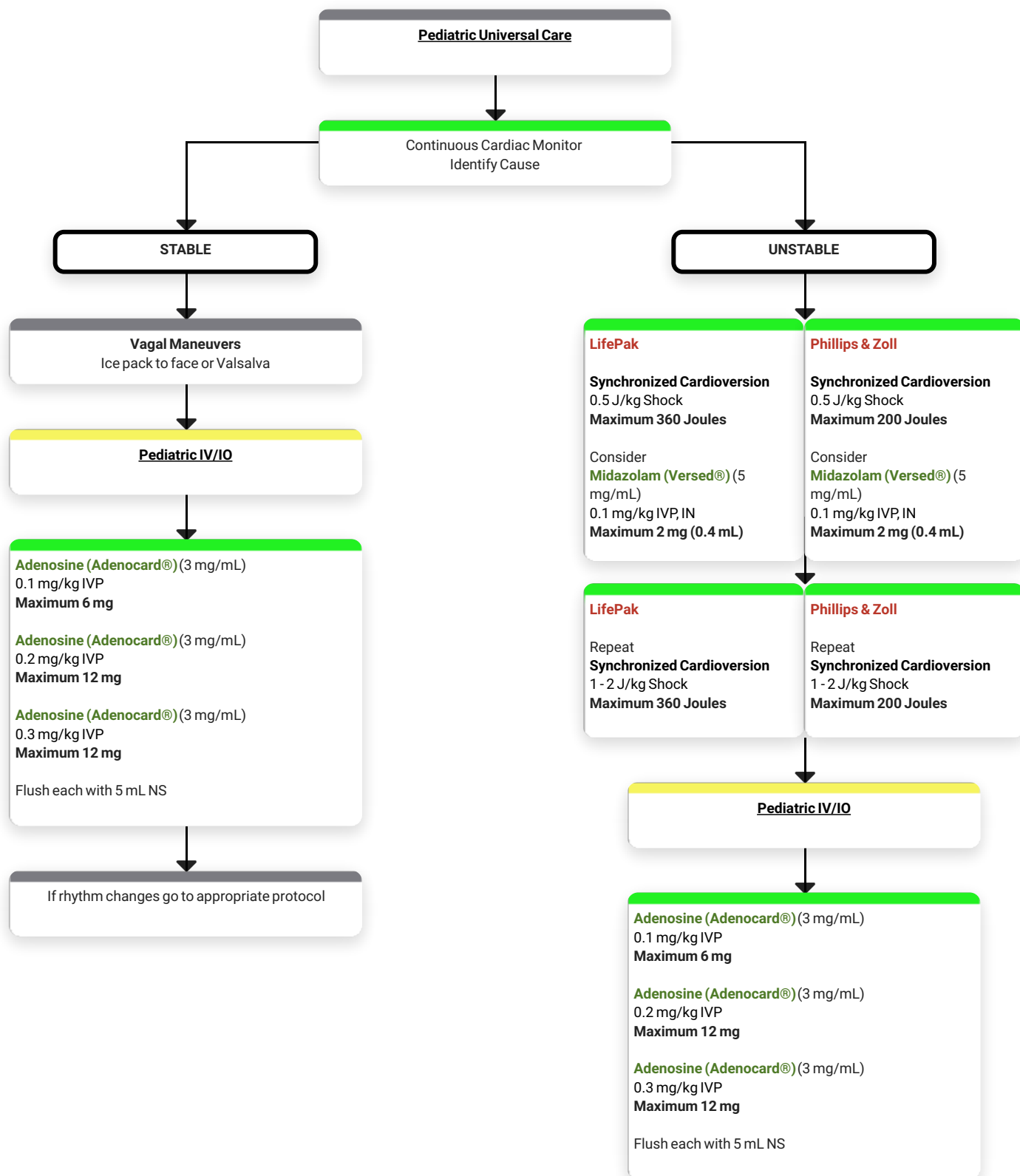
DIFFERENTIAL:

- Respiratory failure
 - Foreign body
 - Secretions
 - Infection
- Hypovolemia
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin ingestion
- Hypoglycemia
- Acidosis

PEARLS:

- Max doses:
 - Epi = 1 mg
 - Amiodarone = 300 mg
 - D25 = 25 ml
 - Narcan = 2 mg
 - Sodium Bicarbonate = 50 meq
- For success to occur, a cause must be identified and corrected
- For ROSC, go to post-resuscitation protocol

Pediatric Supraventricular Tachycardia



Pediatric Supraventricular Tachycardia - Medical Reference

HISTORY:

- Past medical history
- Medications or toxin ingestion (Aminophylline, diet pills, thyroid pills, decongestants, digoxin)
- Drugs - nicotine, cocaine
- Congenital heart disease
- Respiratory distress
- Syncope or near syncope

SIGNS and SYMPTOMS:

- HR > 180 in child
- HR > 220 in infant
- Pale/cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered LOC
- Pulmonary congestion
- Syncope

DIFFERENTIAL:

- Heart disease (congenital)
- Hypo/hyperthermia
- Hypovolemia/anemia
- Electrolyte abnormality
- Anxiety/pain/stress
- Fever/infection/sepsis
- Hypoxia
- Hypoglycemia
- Medication/toxin/drugs
- PE
- Trauma/tension pneumothorax

PEARLS:

- **DO NOT DELAY CARDIOVERSION FOR SEDATION IN UNSTABLE PATIENT.**
- **Exam:** Mental status, skin, neck, lung, heart, abdomen, back, extremities, neuro
- Carefully evaluate the rhythm to distinguish Sinus Tach, SVT, and V-Tach
- Separating the child from caregiver may worsen clinical condition
- Use pediatric hands-free paddles in children < 10 kg or Broselow color purple
- Monitor for respiratory depression and hypotension with Versed use
- Continuous pulse oximetry required
- Document all rhythm changes
- Maximum sinus tachycardia rate is 220
- Patient age in years

Pediatric Gastrointestinal

Pediatric Vomiting/Diarrhea



Pediatric Vomiting/Diarrhea - Medical Reference

HISTORY:

- Age
- Last meal
- Last BM/emesis
- Duration
- Sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history
- Travel history
- Bloody emesis/diarrhea

SIGNS and SYMPTOMS:

- Pain Constant, sharp, dull, etc.
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

ASSOCIATED SYMPTOMS:

- Fever
- Headache
- Blurred vision
- Weakness
- Myalgias
- Cough
- Dysuria
- Mental status changes
- Rash

DIFFERENTIAL:

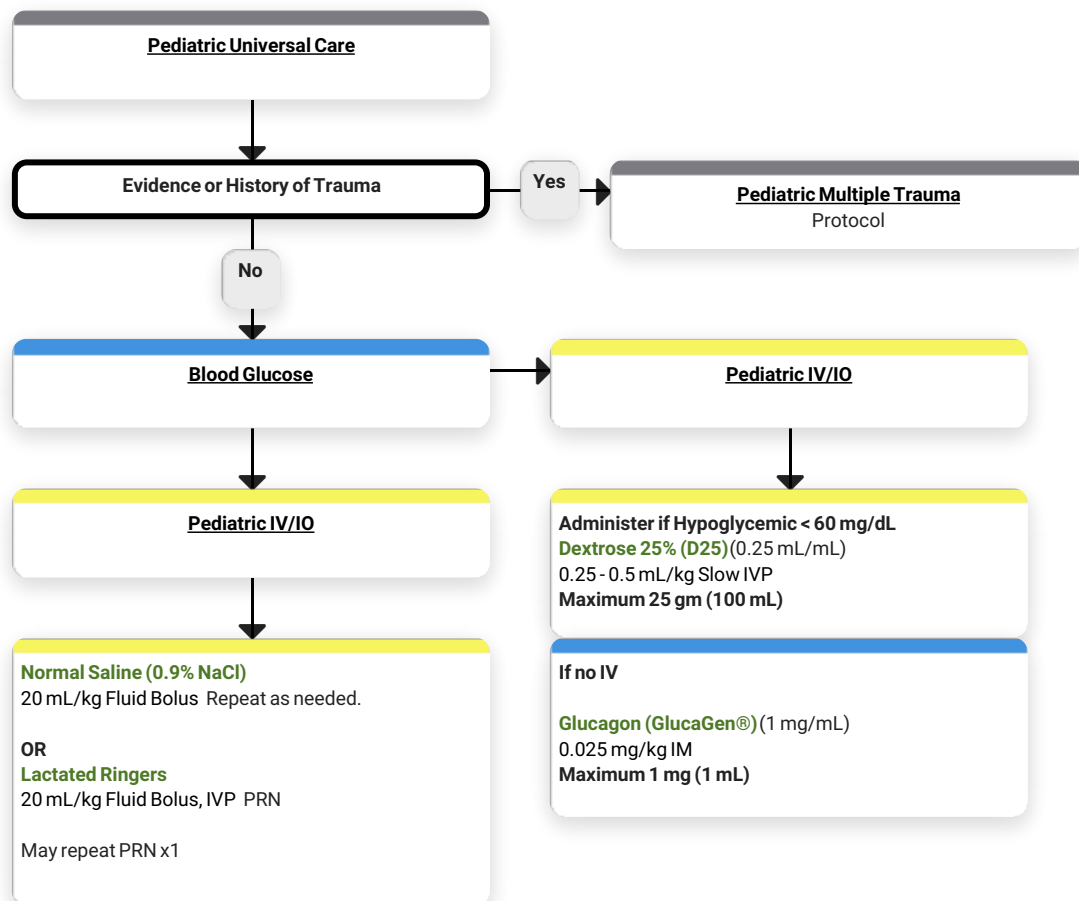
- CNS
- MI
- Drugs
- GI/renal
- DKA
- Gynecologic
- Infections
- Electrolyte imbalance
- Food or toxin induced
- Medication/substance abuse
- Pregnancy
- Psychologic

PEARLS:

- **Exam:** Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neuro
- Monitor frequently to reassess vascular status

Pediatric General Medical

Pediatric Hypotension/Shock Non-Trauma



Pediatric Hypotension/Shock Non-Trauma - Medical Reference

HISTORY:

- Blood loss
- Fluid loss - Vomiting, diarrhea, fever
- Infection
- Medications
- Allergic reaction
- Poor PO intake history

SIGNS and SYMPTOMS:

- Restless, confused
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Rapid pulse
- Decreased BP

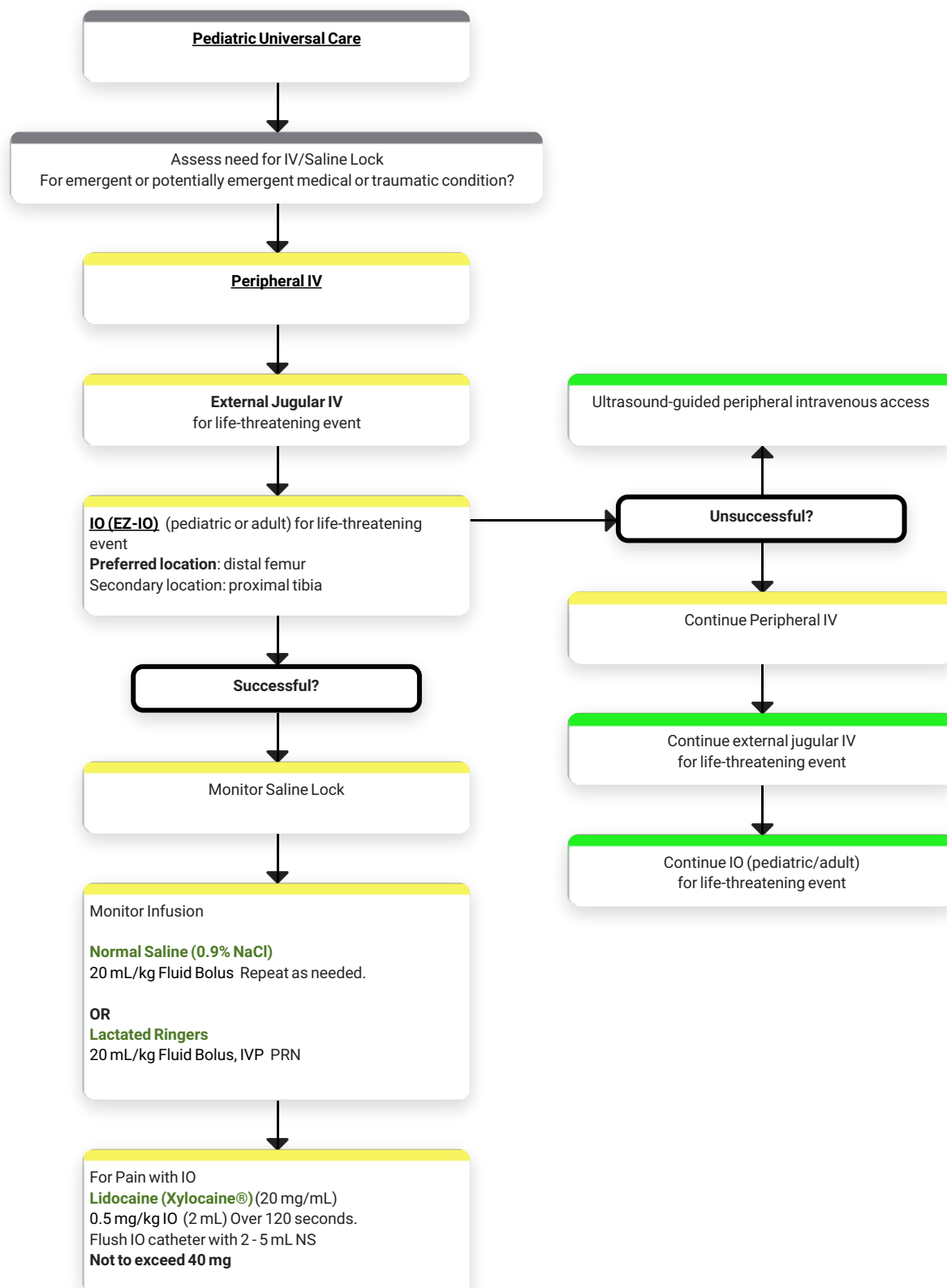
DIFFERENTIAL:

- Trauma
- Infection
- Dehydration
- Vomiting
- Diarrhea
- Fever
- Congenital heart disease
- Medication or toxin

PEARLS:

- **Exam:** Mental status, skin, heart, lungs, abdomen, back, extremities, neuro
- **Maximum dose of D25 = 25 mL per dose, Glucagon = 1 mg**
- Consider all causes of shock and treat per appropriate protocol
- Decreasing heart rate is a sign of impending collapse

Pediatric IV/IO

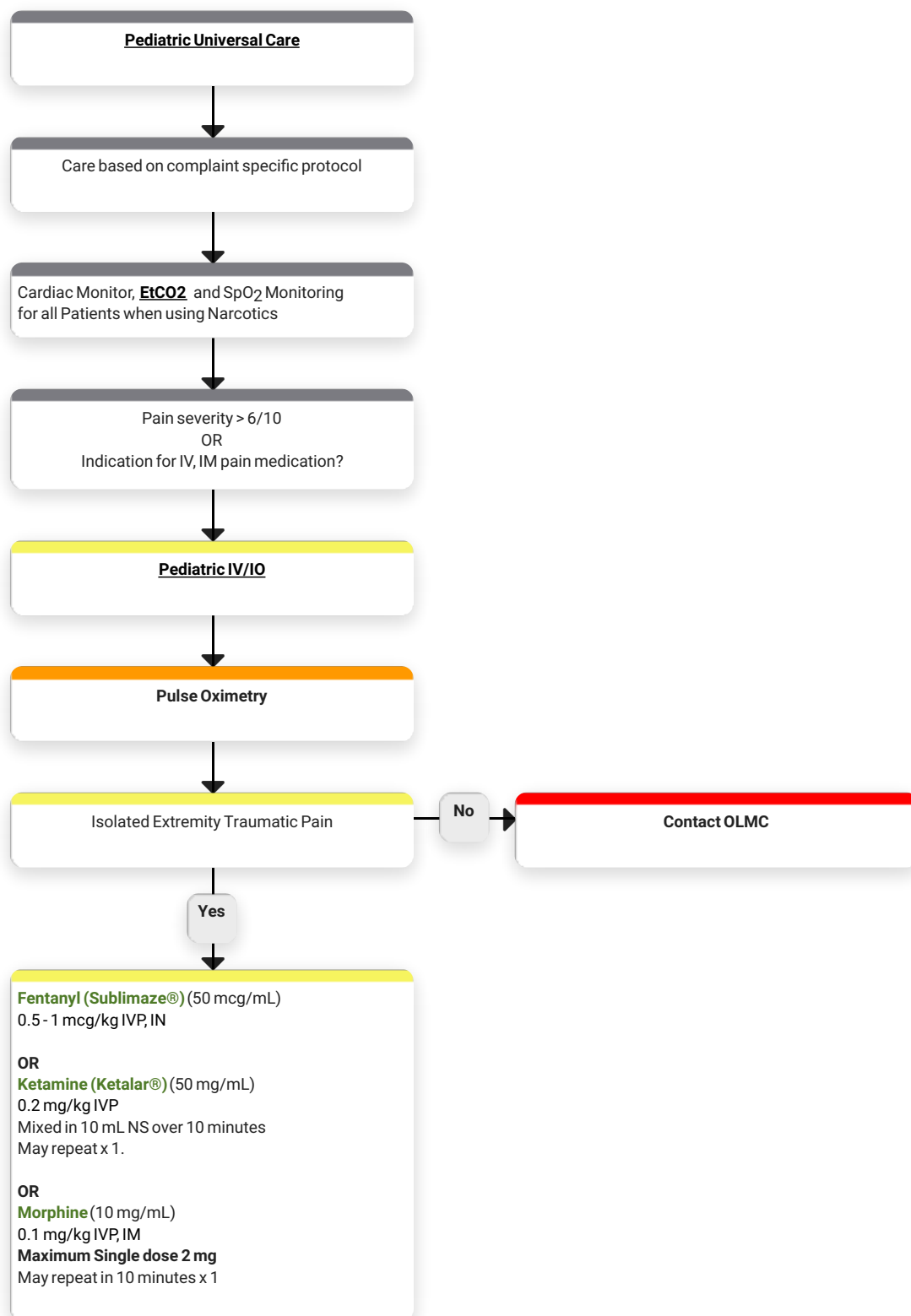


Pediatric IV/IO - Medical Reference

PEARLS:

- IO with EZIO for adult or pediatric patient for cardiac arrest or unresponsive patient with no available IV site
- Saline locks are preferred unless fluid bolus anticipated
- External jugular (> 12 years old)
- Any pre-hospital fluids or medications approved for IV use may be given through IO
- All rates KVO unless giving fluid bolus
- Use microdrips for patients under 6 years old (if available)
- External jugular lines can be attempted initially in life-threatening events with no obvious peripheral site
- In CARDIAC ARREST, pre-existing dialysis shunt or external central venous catheter may be used
- In patients who are hemodynamically unstable or in extremis, contact OLMC prior to accessing dialysis catheter or central catheters
- Any venous catheter which has already been accessed prior to EMS arrival may be used
- Upper extremity preferred to lower extremity IV sites
- In post mastectomy patients, avoid IV/injection or blood pressure in arm on affected side

Pediatric Pain Control



Pediatric Pain Control - Medical Reference

HISTORY:

- Age
- Location
- Duration
- Severity (1-10)
- Past medical history
- Medications
- Drug allergies

SIGNS and SYMPTOMS:

- Severity
- Quality
- Radiation
- Relation to movement
- Increased with palpation

DIFFERENTIAL:

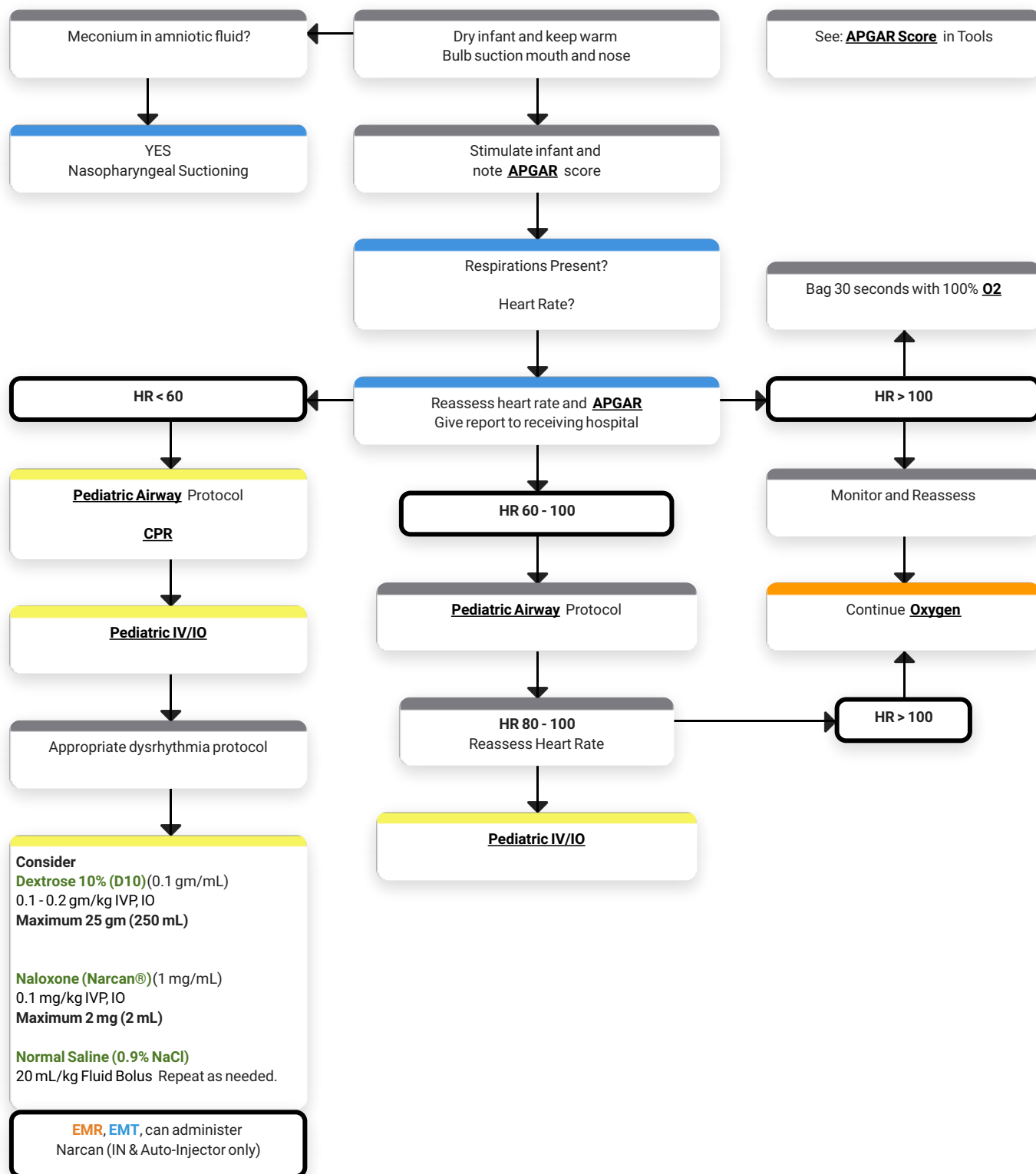
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural/respiratory
- Neurogenic
- Renal

PEARLS:

- **Maximum dose Morphine = 2 mg/dose**
- Pain severity is a vital sign and must be recorded pre and post IV/IM pain medications
- Vitals should be obtained pre, post, and at disposition with all pain medications
- Contraindications to Morphine = hypotension, altered mental status, head injury, respiratory distress, severe COPD
- Document drug allergies
- Observe for drug reaction

Pediatric Neonatal

Pediatric Newly Born



Pediatric Newly Born - Medical Reference

HISTORY:

- Due date and gestational age
- Multiple gestations (twins, etc)
- Meconium
- Delivery difficulties
- Congenital disease
- Maternal medications
- Maternal risk factors
 - Smoking
 - Substance abuse

SIGNS and SYMPTOMS:

- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

DIFFERENTIAL:

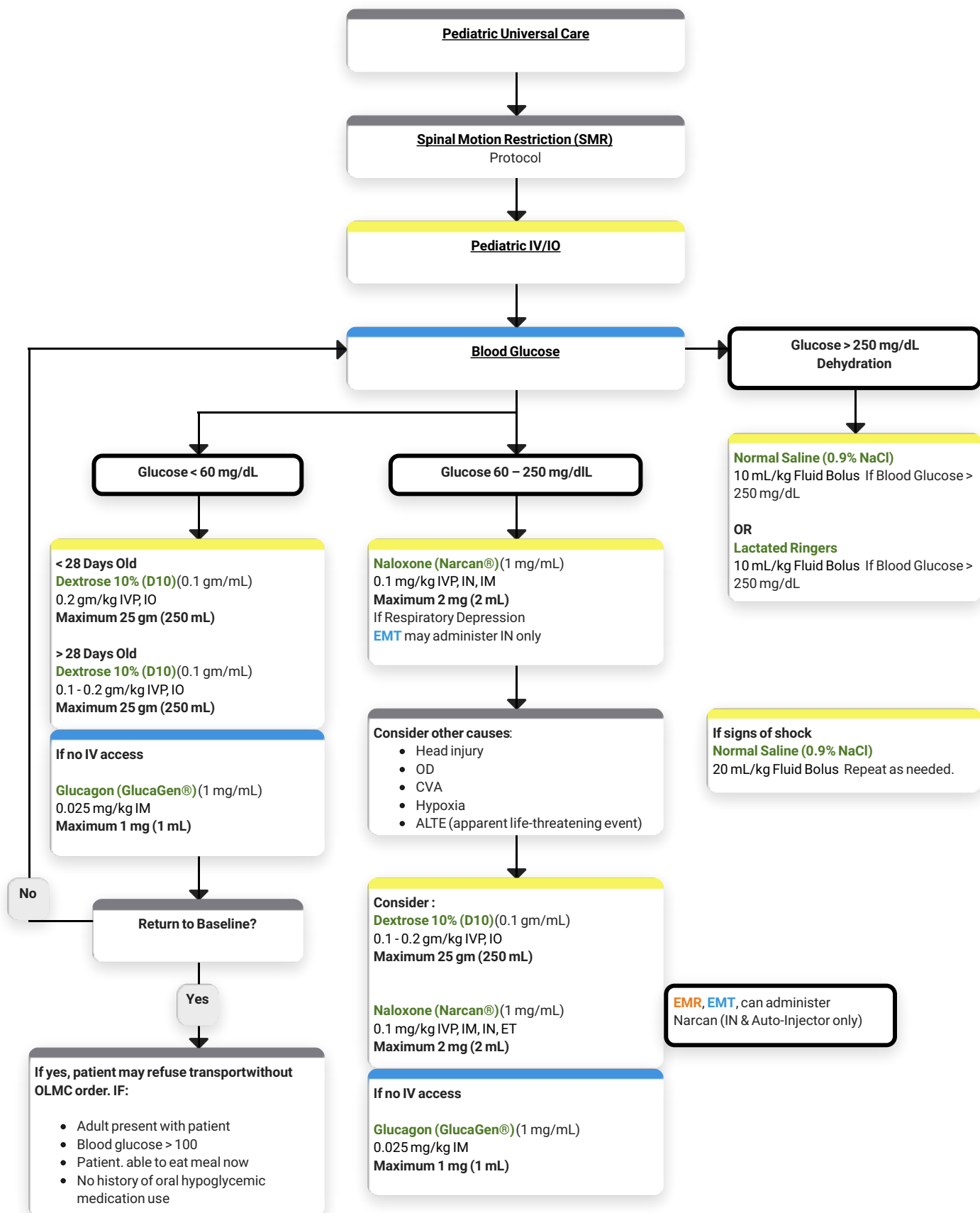
- Airway failure
- Secretions
- Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia

PEARLS:

- Maternal sedation/narcotics will sedate the infant
- Consider hypoglycemia in infant
- Document 1 and 5-minute APGARs
- D12.5% = D50 diluted to 1/4 strength (1 mL D50 with 3 mL saline)

Pediatric Neurological

Pediatric Altered Mental Status



Pediatric Altered Mental Status - Medical Reference

HISTORY:

- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or ingestion
- Past medical history
- Medications
- History of trauma

SIGNS and SYMPTOMS:

- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin, fruity breath)
- Kussmaul respiration, dehydration

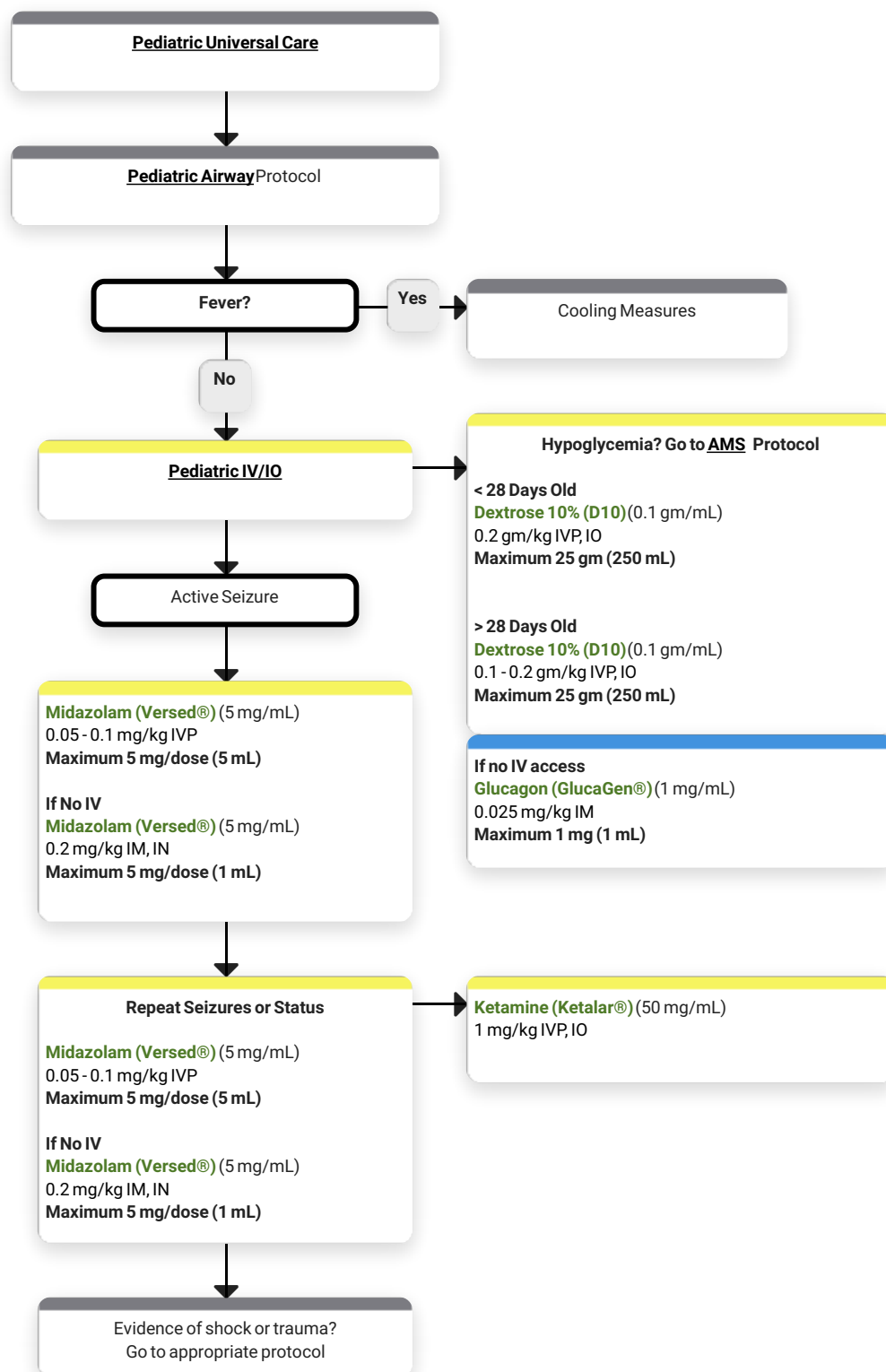
DIFFERENTIAL:

- Head trauma
- CNS (CVA, tumor, seizure, infection)
- Infection
- Thyroid
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper/hypoglycemia)
- Toxicologic
- Acidosis/Alkalosis
- Environmental exposure
- Pulmonary
- Electrolyte abnormality
- Psychiatric

PEARLS:

- **Exam:** Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neuro
- Be aware of AMS as sign of environmental toxin or Haz-Mat exposure
- Safer to assume hypoglycemia than hyperglycemia if doubt exists
 - Low glucose < 60
 - Normal glucose 60-120
 - High glucose > 250

Pediatric Seizure



Pediatric Seizure - Medical Reference

HISTORY:

- Fever
- Previous seizure history
- Reported seizure activity
- History of recent head trauma
- Congenital abnormality

SIGNS and SYMPTOMS:

- Observed seizure activity
- Altered mental status
- Hot, dry skin or elevated body temperature

DIFFERENTIAL:

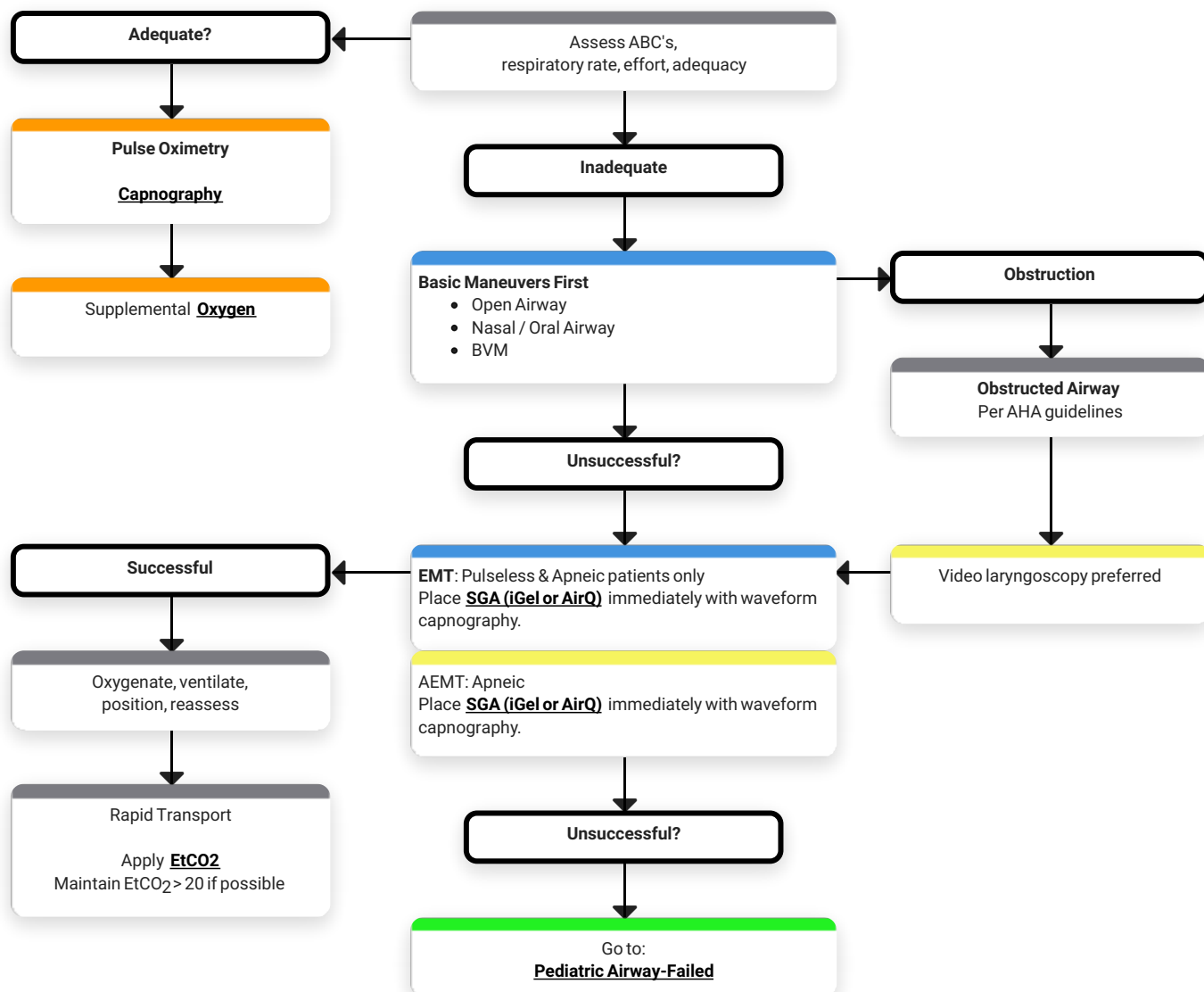
- Fever
- Infection
- Head trauma
- Medication/toxin
- Hypoxia/respiratory failure
- Hypoglycemia
- Metabolic abnormality/acidosis
- Tumor

PEARLS:

- **Maximum dose of D25 = 25 ml**
- **Maximum dose of Glucagon = 1 mg**
- *Status Epilepticus* - > 2 successive seizures without a period of consciousness or recovery
- *Grand mal* - generalized - LOC, incontinence, tongue trauma
- *Focal seizures (petit mal)* - only a part of the body affected and not associated with LOC
- *Jacksonian seizures* - focal seizures that become generalized
- Be prepared to assist ventilation if Versed is used
- Immobilize the spine if there is suspicion of trauma
- In an infant, a seizure may be the only evidence of a closed-head injury

Pediatric Respiratory

Pediatric Airway

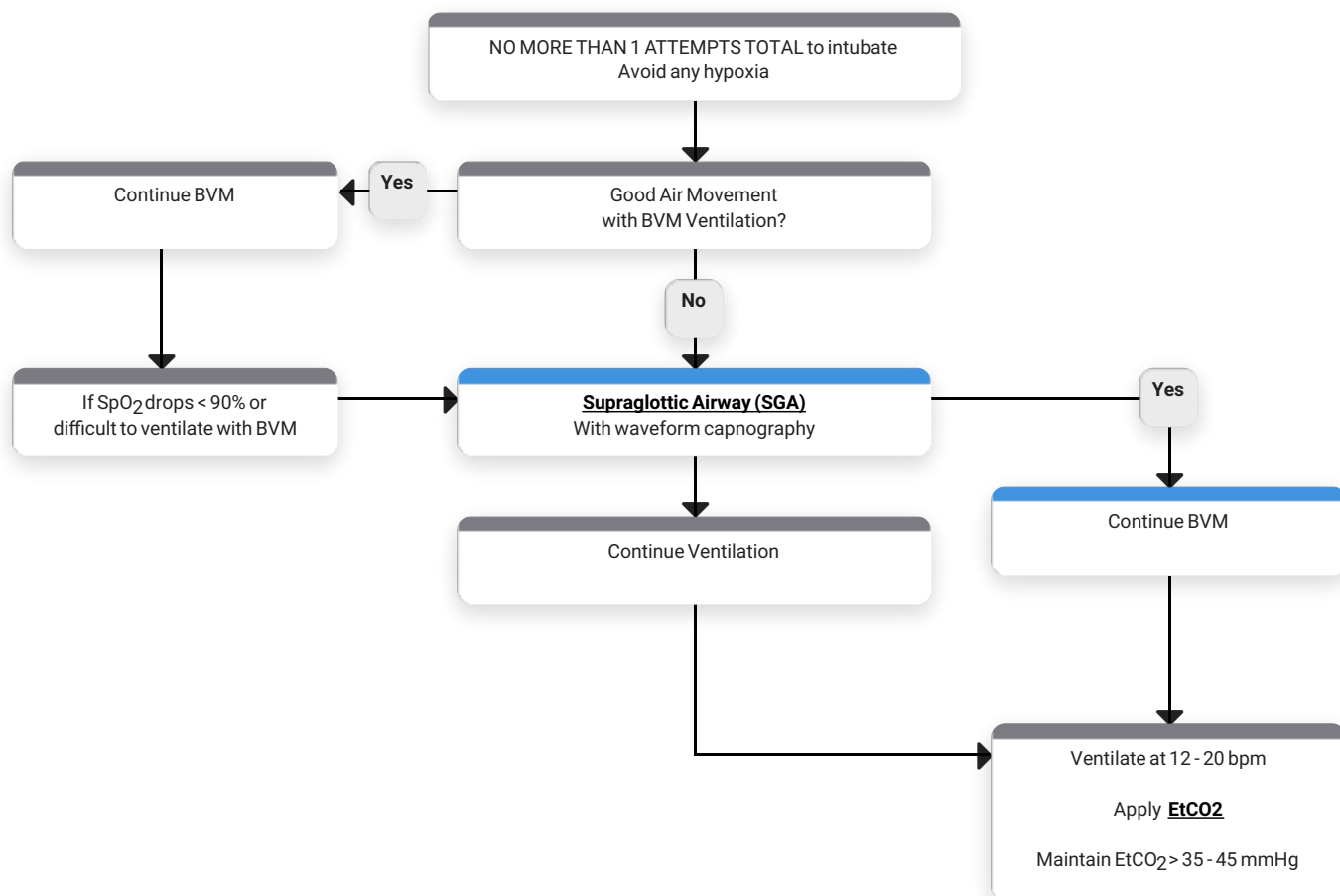


Pediatric Airway - Medical Reference

PEARLS:

- For this protocol, pediatric = < 12 years old
- Capnometry is mandatory with all methods of intubation. Document results.
- If adequate oxygenation and ventilation with BVM, acceptable to defer intubation until arrival at hospital
- Nasal cannula EtCO₂ should be utilized to monitor BVM ventilations
- Limit intubation attempts to 1 per patient
- Maintain C-spine immobilization for patients with suspected spine injury
- Use ELM = External laryngeal manipulation
- Use continuous pulse oximetry
- Consider a C-collar to maintain ETT for intubated patients; remove in ER upon transfer

Pediatric Airway-Failed

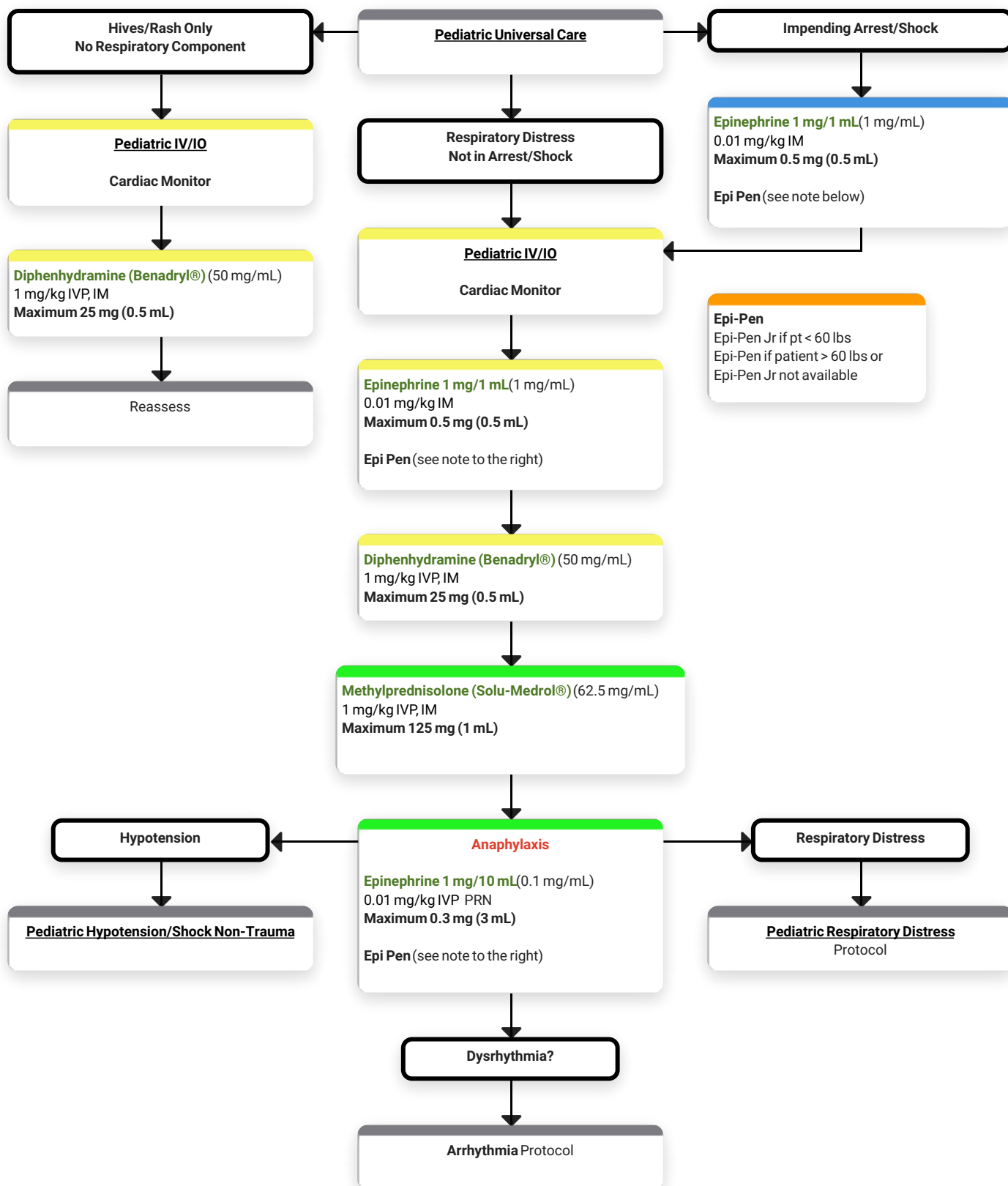


Pediatric Airway-Failed - Medical Reference

PEARLS:

- Preferred first airway in pediatrics is a **SGA** (supraglottic airway)
- Avoid any hypoxia
- Continuous pulse oximetry should be used in all patients
- Notify OLMC as early as possible about difficult/failed airway

Pediatric Allergic Reaction



Pediatric Allergic Reaction - Medical Reference

HISTORY:

- Onset/location
- Insect sting or bite
- Food allergy/exposure
- Medication allergy/exposure
- New clothing, soap
- Past history
- Medication history

SIGNS and SYMPTOMS:

- Itching/hives
- Coughing/wheezing/respiratory distress
- Chest or throat tightening
- Difficulty swallowing
- Hypotension/shock
- Edema

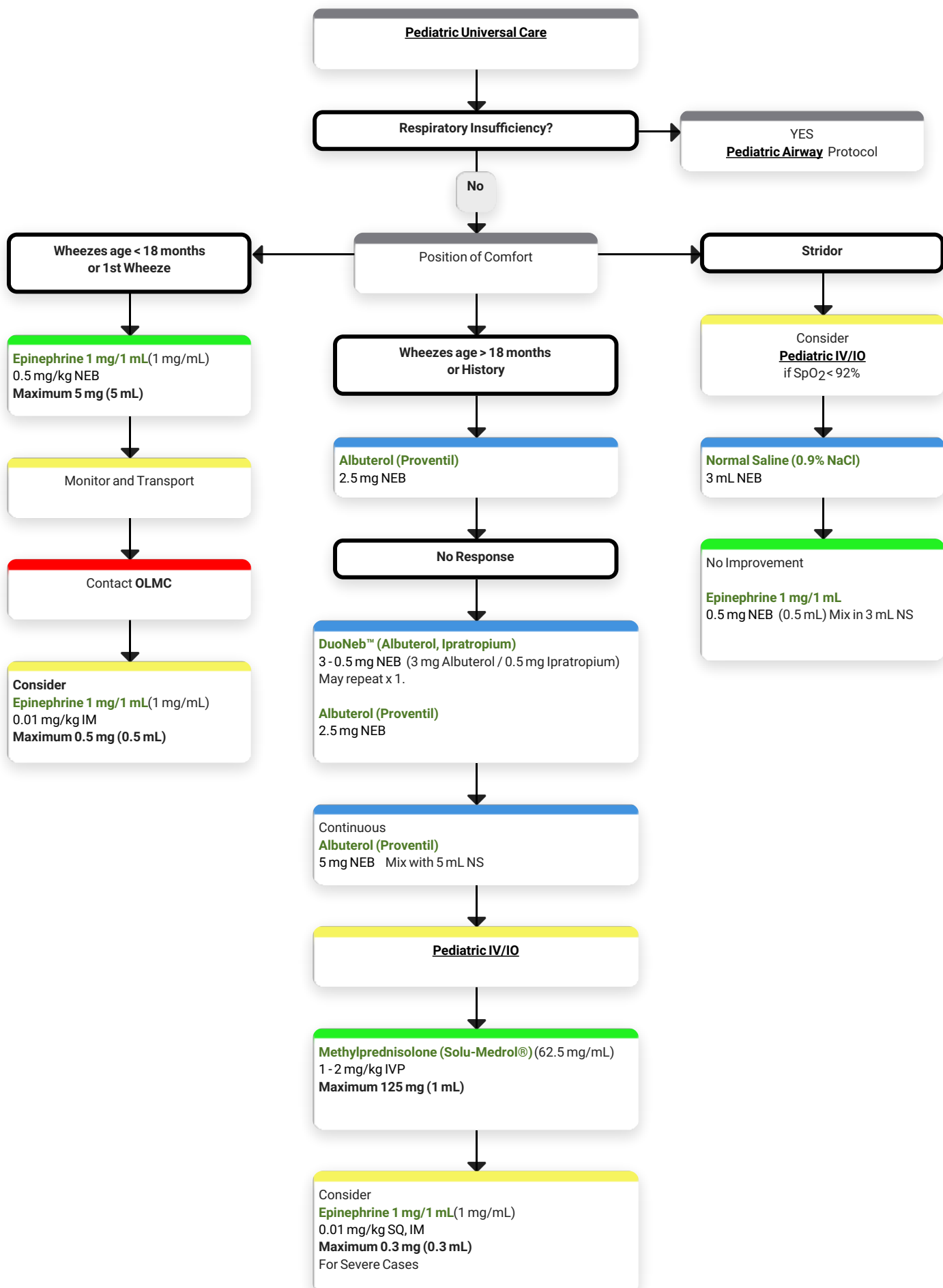
DIFFERENTIAL:

- Urticaria
- Anaphylaxis
- Shock
- Angioedema
- Aspiration
- Vasovagal
- Asthma/COPD
- CHF

PEARLS:

- **Exam:** Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Any patient with respiratory symptoms or extensive reaction should receive Epinephrine and IV/IM Benadryl
- Shorter the onset = more severe the reaction

Pediatric Respiratory Distress



Pediatric Respiratory Distress - Medical Reference

HISTORY:

- Asthma
- COPD
- CHF
- Home treatment (oxygen/nebulizer)
- Meds (theophylline, steroids, inhalers)
- Toxic exposure
- Smoke inhalation

SIGNS and SYMPTOMS:

- SOB
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi, rales, stridor
- Accessory muscle use
- Fever, cough, tachycardia

DIFFERENTIAL:

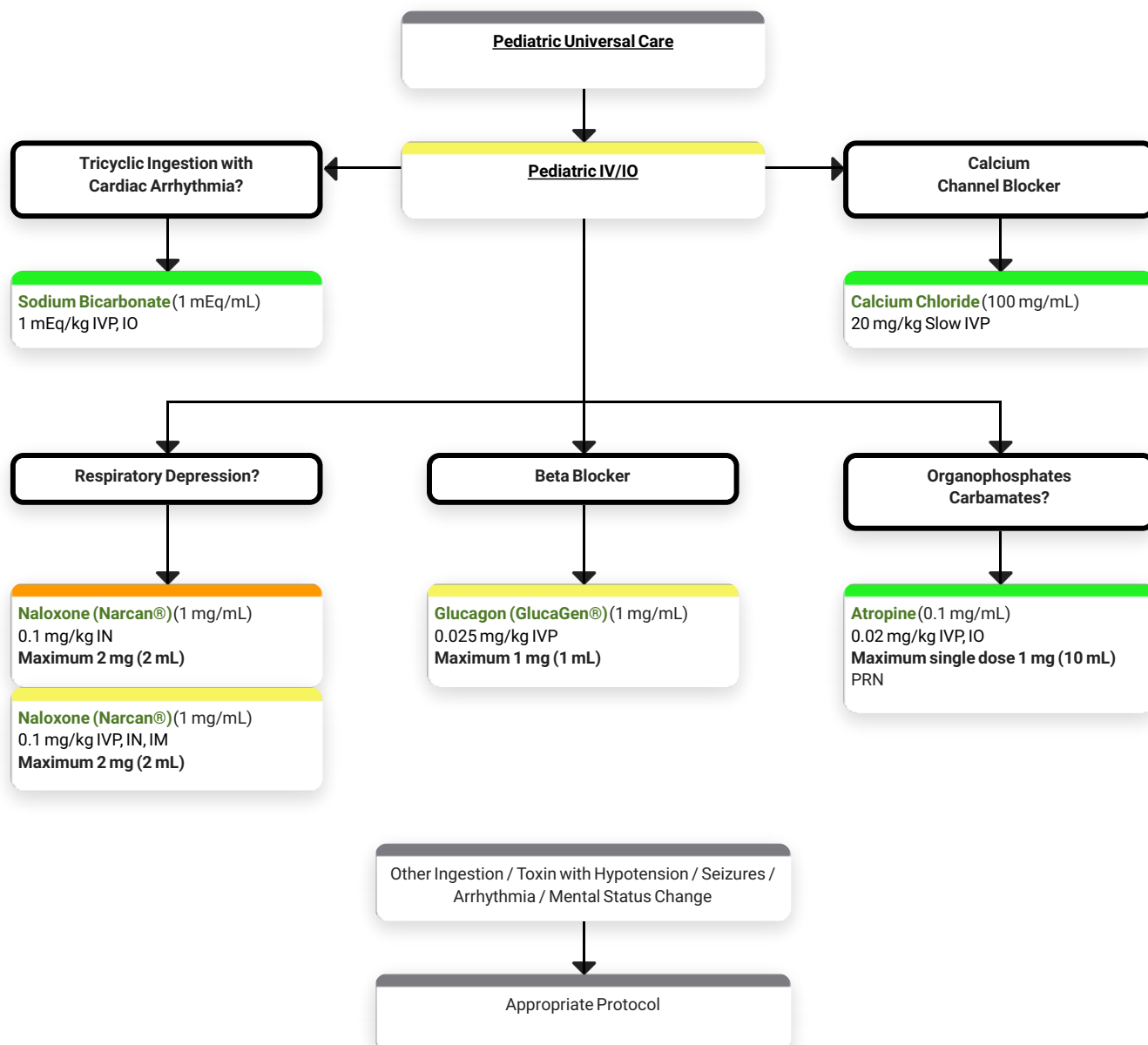
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pneumonia/pleural effusion
- Pneumothorax
- Cardiac (MI/CHF)
- PE
- Tamponade
- Hyperventilation
- Inhaled toxin

PEARLS:

- Pulse oximetry should be monitored continuously
- Do not force a child into a position. They protect their airway by body position
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to albuterol
- Croup typically affects children < 2 years old. It is viral and may be associated with fever, gradual onset, no drooling
- Epiglottitis typically affects children > 2 years old. It is bacterial, with fever, rapid onset, possible stridor, and common drooling
- For patients on Xopenex, you may continue a treatment in place of albuterol. Use patient meds and dosing (0.3 mg - 1.25 mg) NEB

Pediatric Toxicology

Pediatric Overdose/Toxic Exposure



Pediatric Overdose/Toxic Exposure - Medical Reference

HISTORY:

- Ingestion or suspected ingestion of toxic substance
- Substance ingested, quantity, route
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

SIGNS and SYMPTOMS:

- Mental status changes
- Hypotension/hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures

DIFFERENTIAL:

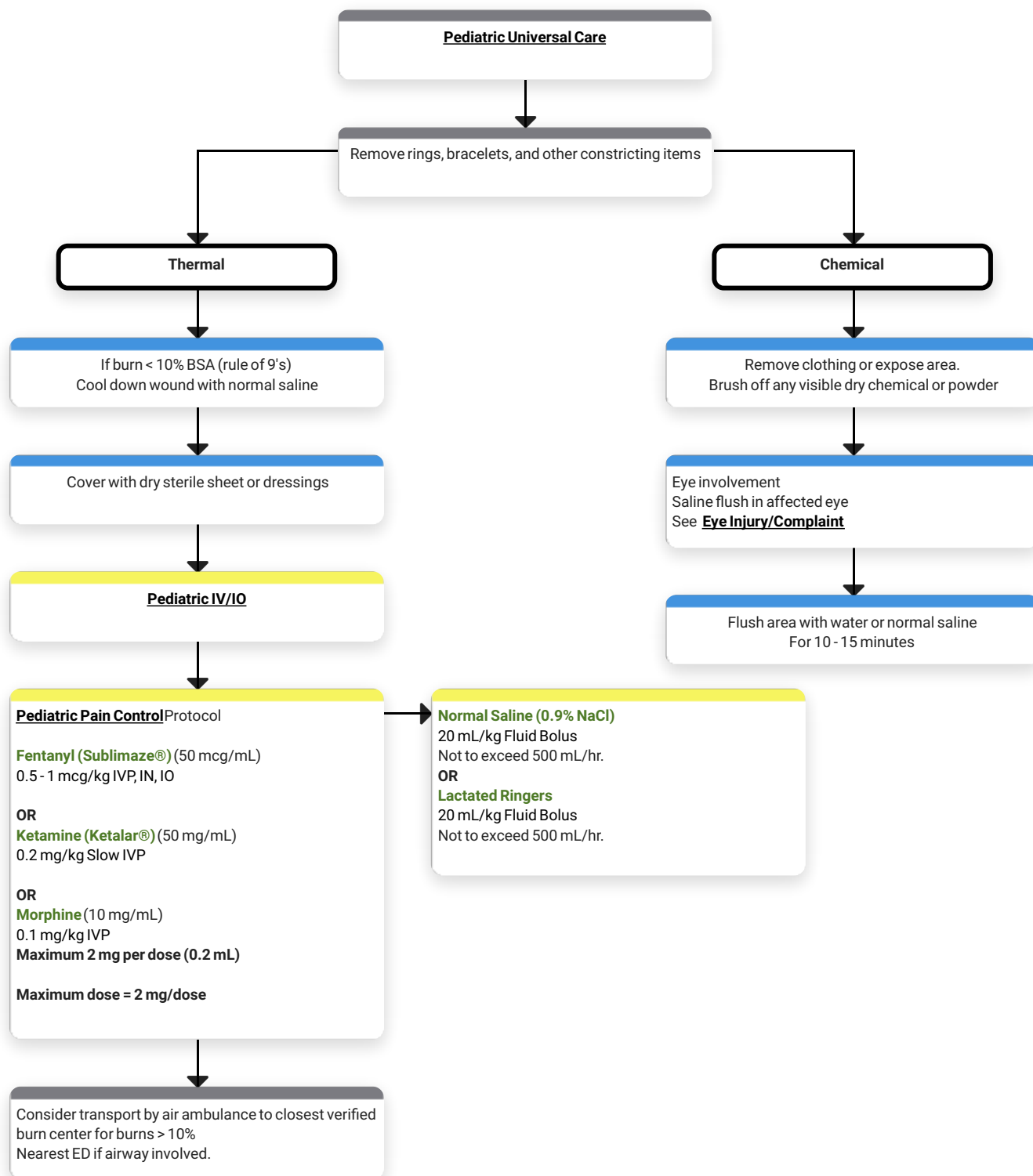
- TCA's
- Acetaminophen
- Depressants
- Stimulants
- Anticholinergic
- Cardiac meds
- Solvents, alcohols, cleaning agents
- Insecticides (organophosphates)

PEARLS:

- **Exam:** Mental status, skin, HEENT, heart, lungs, abdomen, extremities, neuro
- **Maximum Dose:** Narcan 2 mg, Glucagon 1 mg, Calcium Chloride 1 g, Sodium Bicarbonate 50 mEq, Atropine 2 mg/dose (minimum = 0.1 mg)
- Do not rely on patient history of ingestion in suicide attempt
- Bring bottles to ED
- TCA: seizure, dysrhythmias, hypotension, decreased mental status, coma
- Acetaminophen: normal or N/V - causes irreversible liver failure if not detected
- Depressants: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- Stimulants: increased HR, increased BP, increased temperature, dilated pupils, seizures
- Anticholinergic: increased HR, increased temperature, dilated pupils, mental status change
- Cardiac meds: dysrhythmias, mental status changes
- Insecticides: increased/decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints per restraints procedures
- Mark I kits contain 2 mg Atropine and 600 mg Pralidoxime in autoinjector

Pediatric Trauma

Pediatric Burns



Pediatric Burns - Medical Reference

HISTORY:

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other Trauma
- LOC

SIGNS and SYMPTOMS:

- Burns, pain, swelling
- Dizziness
- LOC
- Hypotension/shock
- Airway compromise/distress
- Singed facial or nasal hair
- Hoarseness or wheezing

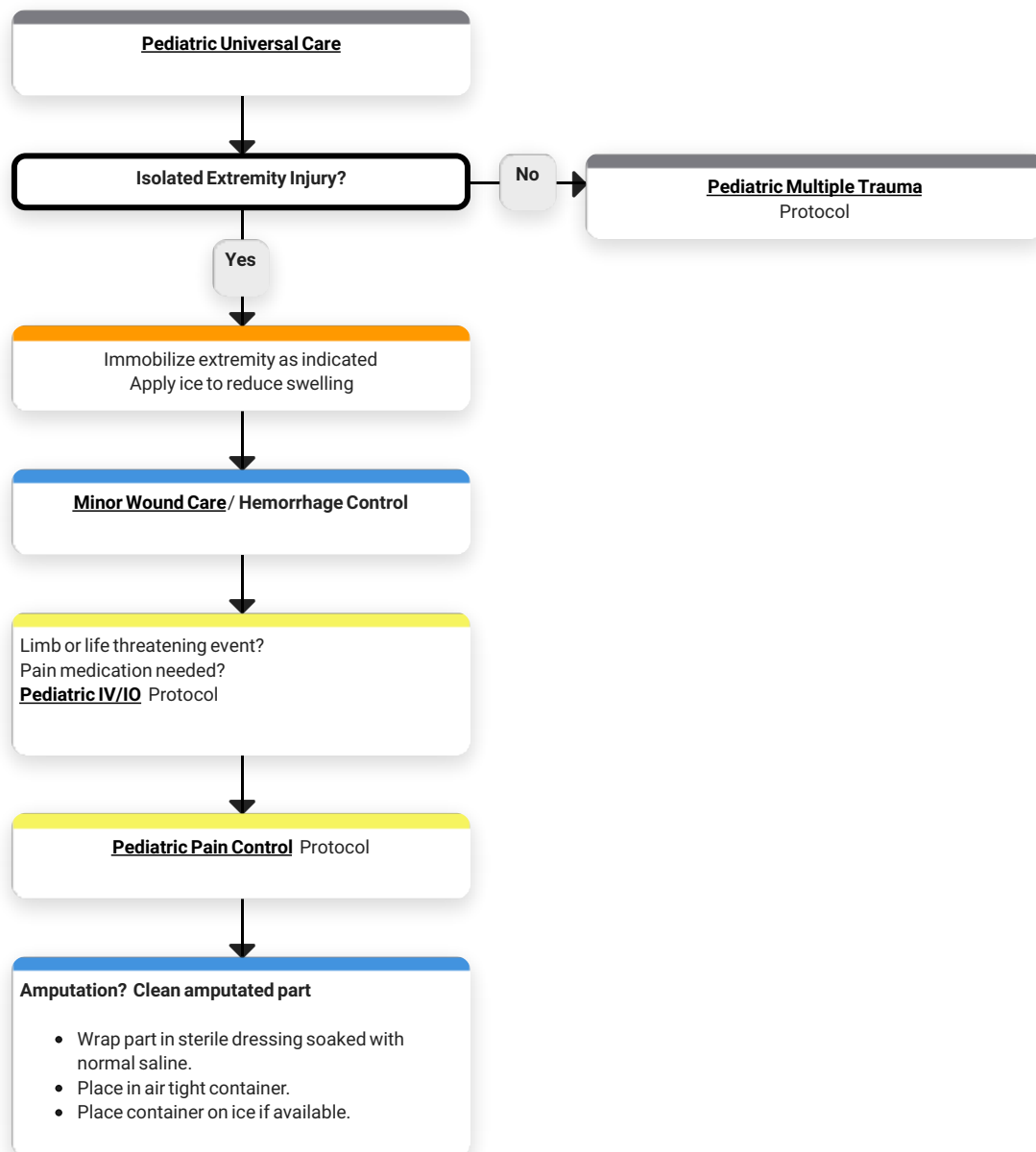
DIFFERENTIAL:

- Superficial (1st degree)
 - red and painful
- Partial thickness (2nd degree)
 - blistering
- Full thickness (3rd degree)
 - painless/ charred leathery skin
- Chemical
- Thermal
- Electrical
- Radiation

PEARLS:

- **Exam:** Mental status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- **Critical Burns:** > 20% BSA age > 10; > 10% BSA age < 10; 3rd Degree burns > 10% BSA;
 - 2nd or 3rd degree burns to face, eyes, hands or feet; electrical burns, respiratory burns, deep chemical burns, burns with extremes of age or chronic disease; burns associated with major traumatic injury.
 - These burns require admission or transfer to a burn center
- Early intubation required in significant inhalation injuries
- Treat potential CO exposure with 100% Oxygen
- Circumferential burns to extremities are dangerous due to potential vascular compromise due to soft tissue swelling
- Burn patients are prone to hypothermia
- Do not overlook possibility of multi-system trauma
- Do not overlook possibility of child abuse.

Pediatric Extremity Trauma



Pediatric Extremity Trauma - Medical Reference

HISTORY:

- Type of injury
- Mechanism: crush/penetrating/amputation
- Time of injury
- Open vs. Closed wound/fracture
- Wound contamination
- Medical history
- Medications

SIGNS and SYMPTOMS:

- Pain
- Swelling
- Deformity
- Altered sensation/motor function
- Diminished pulse/cap refill
- Decreased extremity temperature

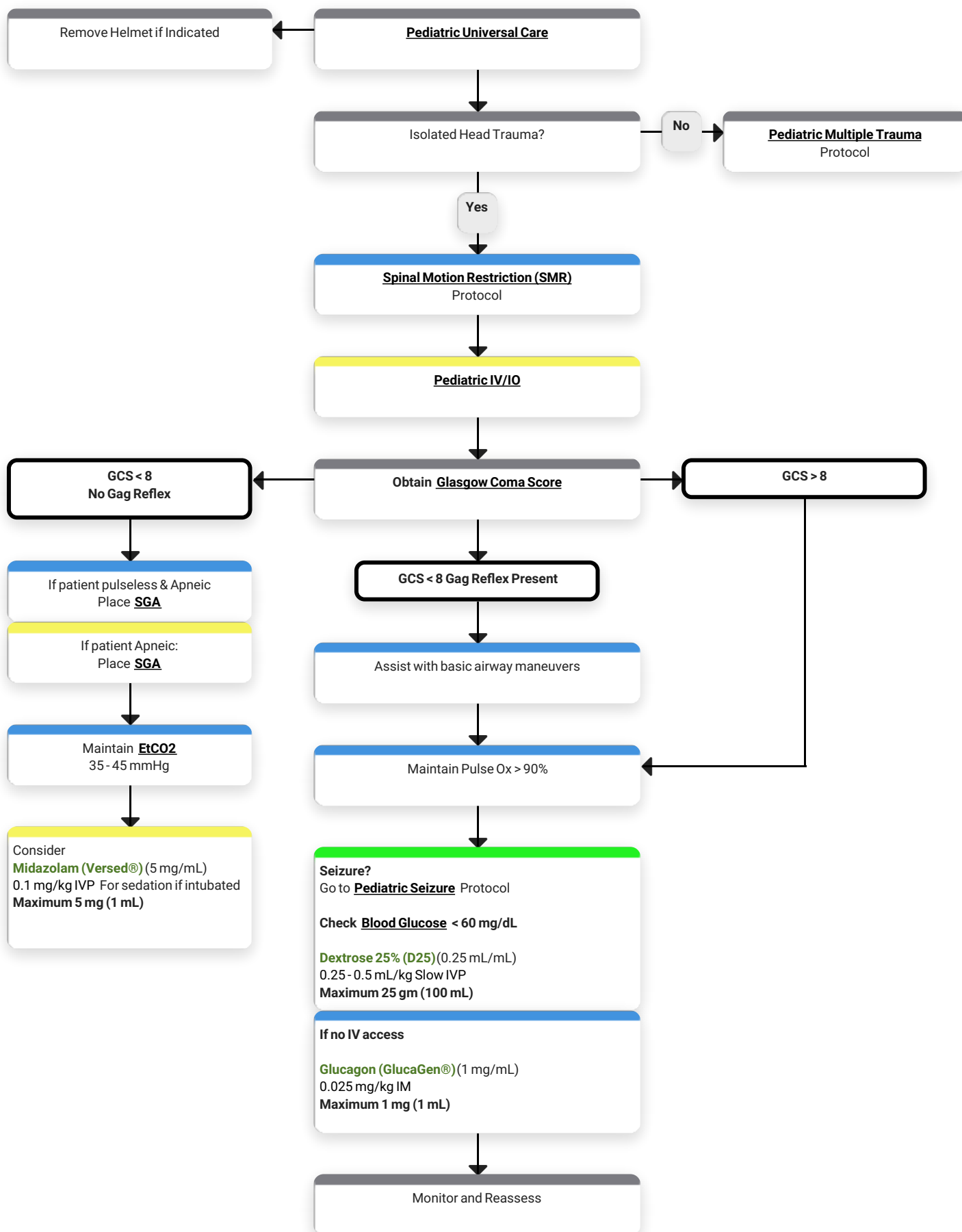
DIFFERENTIAL:

- Abrasion
- Confusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputations

PEARLS:

- **Exam:** Mental status, extremity, neuro
- In amputations, time is critical. Consider transport to pediatric trauma center.
- Hip dislocation and knee and elbow fracture/dislocations have a high incidence of vascular compromise
- Urgently transport any injury with vascular compromise
- Blood loss may be concealed or not apparent with extremity injuries
- Severe bleeding not rapidly controlled may necessitate application of a tourniquet
- Lacerations must be evaluated for repair within 6 hours from the time of injury

Pediatric Head Trauma



Pediatric Head Trauma - Medical Reference

HISTORY:

- Time of injury
- Mechanism: blunt/penetrating
- LOC
- Bleeding
- Medical history
- Medication
- Evidence of multi-trauma
- Helmet use/damage to helmet

SIGNS and SYMPTOMS:

- Pain
- Swelling
- Bleeding
- Altered mental status
- Unconsciousness
- Respiratory distress/failure
- Vomiting
- Significant MOI

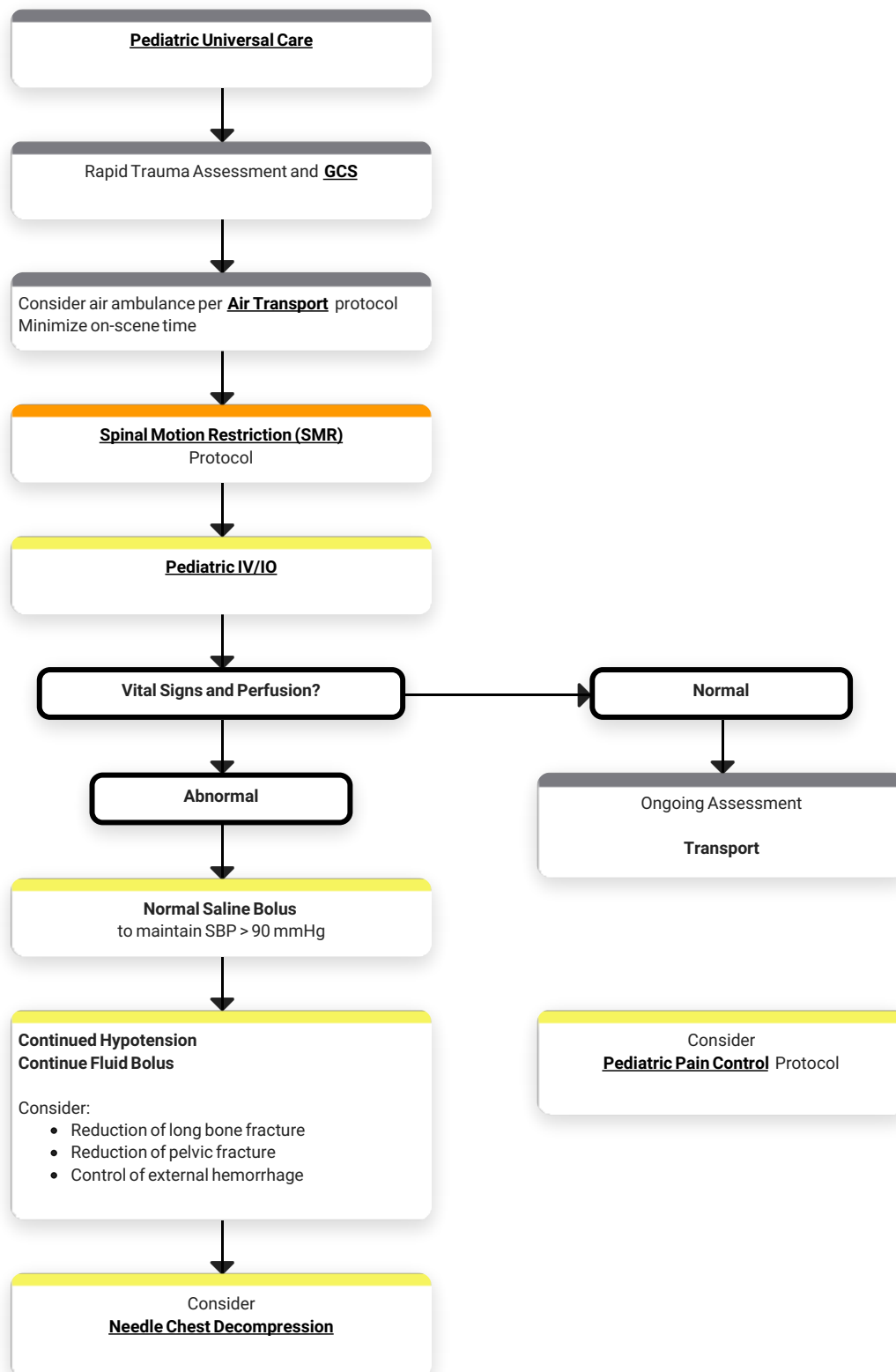
DIFFERENTIAL:

- Skull fracture
- Brain injury (concussion, contusion, hemorrhage, laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

PEARLS:

- **Exam:** Mental status, skin, HEENT, heart, lungs, abdomen, extremities, back, neuro
- Consider air transport for GCS < 12; anticipate intubation for GCS < 8
- **Cushing's Response:** Elevated ICP causing hypertension and bradycardia
- Hypotension usually indicates injury or shock unrelated to head injury and should be aggressively treated
- Monitor and document changes in LOC and GCS
- Consider restraints if necessary for safety of patient and/or personnel protection. Do not use Haldol
- Concussions are periods of confusion or LOC associated with trauma and may be resolved upon arrival of EMS
- Any prolonged period of confusion or mental status abnormality that does not return to normal within 15 minutes should be evaluated by a physician

Pediatric Multiple Trauma



Pediatric Multiple Trauma - Medical Reference

HISTORY:

- Time and MOI
- Damage to structure/vehicle
- Location in structure/vehicle
- Others injured/dead
- Speed and details of MVC
- Restraints/protective equipment
 - Car seat
 - Helmet
 - Pads
- Ejection
- Past medical history
- Medications

SIGNS and SYMPTOMS:

- Pain
- Swelling
- Altered mental status
- Unconscious
- Deformity
- Bleeding
- Hypotension/shock
- Arrest

DIFFERENTIAL:

- Chest
 - Tension pneumothorax
 - Flail chest
 - Pericardial tamponade
 - Open chest wound
 - Hemothorax
- Intra-abdominal bleeding
- Pelvis/femur fracture
- Spine fracture/cord injury
- Head injury
- Extremity fracture/dislocation
- Airway obstruction
- Hypothermia

PEARLS:

- **Exam:** Mental status, HEENT, heart, lungs, abdomen, extremities, back, neuro
- Mechanism is the most reliable indicator of serious injury. Examine all restraints/protective equipment for damage
- In prolonged extrications/serious trauma, consider air transport
- Severe bleeding from an extremity not rapidly controlled may necessitate the application of a tourniquet
- Do not overlook the possibility of child abuse

Pharmacology

Adenosine (Adenocard®)

Paramedic

Special Notes:

Onset: Half life < 10 sec. Adenosine will not convert atrial fib., atrial flutter, or VT to NSR **Peak Effect:** N/A

Adult Indications & Dosing

- **Supraventricular Tachycardia**
 - 12 mg Rapid IVP (Push with 10 mL NS)
May repeat x 1

Pediatric Indications & Dosing

- **Pediatric Supraventricular Tachycardia**
 - 0.1 mg/kg (3 mg/mL) IVP
Maximum 6 mg
 - 0.2 mg/kg (3 mg/mL) IVP
Maximum 12 mg
 - 0.3 mg/kg (3 mg/mL) IVP
Maximum 12 mg

Contraindications

- 2nd & 3rd degree AV Block
- Sick Sinus Syndrome
- Symptomatic bradycardia, unless patient has functioning artificial pacemaker

Adverse Reactions

- **Cardiovascular:** Facial flushing, Headache, Sweating, Palpitations, Chest Pain, Hypotension
- **Respiratory:** Shortness of Breath, Chest Pressure, Hyperventilation, Head Pressure
- **Central Nervous System:** Lightheadedness, Dizziness, Tingling in Arms, Numbness, Apprehension, Blurred Vision, Burning Sensation, Heaviness in Arms, Neck, and Back
- **Gastrointestinal:** Nausea, Metallic Taste, Tightness in Throat, Pressure in Groin

Precautions

- May be rarely associated with ventricular fibrillation. The effects of adenosine are antagonized by methylxanthines such as caffeine and theophylline. In their presence, larger doses may be required or adenosine may not be effective. At the time of conversion to a sinus rhythm, a variety of new rhythms may occur. Generally, these last a short period and are normally corrected on their own with no intervention.

Medical Considerations

- Adult dose: Flush with 20 ml NS after each dose
- Pediatric dose: Flush with 5 ml NS after each dose IV at antecubital site preferred

Mechanism of Actions

- Antiarrhythmic

Albuterol (Proventil)

EMT

AEMT

Paramedic

Special Notes:

Onset: improvement within 5 min. Peak Effect: 2 hours

Adult Indications & Dosing

- **Respiratory Distress**
 - 2.5 mg NEB

Pediatric Indications & Dosing

- **Pediatric Respiratory Distress**
 - 2.5 mg NEB
 - 5 mg NEB

Contraindications

- Hypersensitivity
- Use caution in patients with tachydysrhythmias and cardiovascular disorders

Adverse Reactions

- **Cardiovascular:** Tachycardia, Hypertension
- **Central Nervous System:** Tremors, Dizziness, Nervousness, Headache, Insomnia
- **Ear, Nose, and Throat:** Pharyngitis, Nasal Congestion
- **Gastrointestinal:** Nausea, Dyspepsia
- **Respiratory:** Bronchospasm, Cough, Bronchitis, Wheezing

Precautions

- Should be used with caution in patients with cardiovascular disorders, especially coronary insufficiency, cardiac arrhythmias and hypertension, in patients with convulsive disorders, hyperthyroidism or diabetes mellitus.

Medical Considerations

- Use of mouthpiece is most effective route if patient is cooperative

Mechanism of Actions

- Bronchodilator

Amiodarone (Cordarone®)

Paramedic

Special Notes:

Onset: Immediate Peak Effect: N/A

Adult Indications & Dosing

- Ventricular Tachycardia/Wide Complex w/Pulse
 - 150 mg IVP Over 10 minutes
 - 1 mg/min IV Infusion
- V-Fib/Pulseless V-Tach
 - 300 mg IVP, IO
 - 150 mg IVP, IO

Pediatric Indications & Dosing

- Pediatric Pulseless Arrest
 - 5 mg/kg (50 mg/mL) IVP, IO**Maximum 300 mg**

Contraindications

- N/A

Adverse Reactions

- **Body as a Whole:** Fever
- **Cardiovascular:** Hypotension, Asystole/Cardiac Arrest/EMD, Cardiogenic Shock, CHF, Bradycardia, Ventricular Tachycardia, A-V Block
- **Digestive System:** Nausea

Precautions

- Like all antiarrhythmic agents, may cause a worsening of existing arrhythmias or precipitate a new arrhythmia. 2% of patients were reported to have respiratory distress syndrome (ARDS). May produce vasodilation and hypotension. **Do not use with irregular Tachyarrhythmias or Torsades.**

Medical Considerations

- Use large needle when drawing drug into syringe, and draw slowly. This will help prevent foaming.

Mechanism of Actions

- Antiarrhythmic

Aspirin

EMT

AEMT

Paramedic

Special Notes:

Onset: Peak effect: 15 minutes to 2 hours

Adult Indications & Dosing

- **Chest Pain**
 - 324 mg PO

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Ulcers
- GI disorders
- Other bleeding disorders
- Allergy / hypersensitivity
- Renal failure

Adverse Reactions

- **GI:** GI bleeding, nausea, vomiting
- **Respiratory:** Bronchospasm

Precautions

- Use cautiously in patients with asthma, pregnancy.
- A one-time dose is safe if patient is on coumadin.

Medical Considerations

- None

Mechanism of Actions

- Blood modifier, Platelet aggregation

Atropine

Paramedic

Special Notes:

Onset: 2 – 5 minutes Peak Effect: 15 – 30 minutes

Adult Indications & Dosing

- **Bradycardia**
 - 1 mg IVP, IO
Maximum 3 mg
- **Adult Rapid Sequence Intubation (RSI) Procedure** **Adult Rapid Sequence Intubation (RSI) Checklist**
 - 0.4 mg IVP, IO For excessive salivation due to Ketamine
- **Overdose/Toxic Ingestion**
 - 2 mg IVP Every 5 minutes
No Maximum Dose

Pediatric Indications & Dosing

- **Pediatric Bradycardia** **Pediatric Overdose/Toxic Exposure**
 - 0.02 mg/kg (0.1 mg/mL) IVP, IO
Maximum single dose 1 mg (10 mL)

Contraindications

- Hypersensitivity
- Glaucoma

Adverse Reactions

- **Cardiovascular:** Palpitations, bradycardia (following low doses of atropine), Tachycardia (after higher doses)
- **CNS:** Headache, Flushing, Nervousness, drowsiness, weakness, dizziness, fever. Elderly may exhibit mental confusion or excitement to even small doses, larger doses, Restlessness, Tremor
- **Gastrointestinal:** Nausea, Vomiting, Heartburn

Precautions

- May produce drowsiness, dizziness or blurred vision. Use cautiously in patients with asthma or allergies. Use caution in Coronary artery disease, CHF, Cardiac arrhythmias, Tachycardia, Hypertension, Infants, small children, Debilitated patients with chronic lung disease.

Medical Considerations

- Use caution in patients with asthma, allergies, CAD, CHF, HTN, infants, small children, & persons with Down's syndrome.

Mechanism of Actions

- Anticholinergic, Increases heart rate

Calcium Chloride

Paramedic

Special Notes:

Onset: Immediate Peak Effect: N/A

Adult Indications & Dosing

- Pulseless Electrical Activity (PEA) Ventricular Tachycardia/Wide Complex w/Pulse
 - 1 gm IVP, IO

Pediatric Indications & Dosing

- Pediatric Overdose/Toxic Exposure
 - 20 mg/kg (100 mg/mL) Slow IVP

Contraindications

- Patients with the risk of existing digitalis toxicity

Adverse Reactions

- Rapid injection may cause tingling sensations, a calcium taste, or heat wave
- Peripheral vasodilation, local burning, or moderate fall in BP
- If infiltration occurs, IV administration at the site should be discontinued at once

Precautions

- Injections should be made slowly through a small needle into a large vein to minimize venous irritation and avoid undesirable reactions.

Medical Considerations

- Irritating to veins and must not be injected into tissue; severe necrosis and sloughing may occur.

Mechanism of Actions

- Hyperkalemia, Calcium channel blocker

Cefazolin (Ancef)

Paramedic

Special Notes:

Onset: Rapid

Adult Indications & Dosing

- **Extremity Trauma**
 - 2 gm IVP

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- History of allergy to any cephalosporin class antibiotic.

Adverse Reactions

- Pain, swelling, rash at the injection site.

Precautions

- There is believed to be some cross-allergy between penicillin and cephalosporin antibiotics. Providers should inquire to determine if there is a history of allergy to penicillin or cephalosporin antibiotics prior to administering cefazolin, however the inability to determine such should not preclude the administration of cefazolin.

Medical Considerations

- None

Mechanism of Actions

- Antibiotic. First generation cephalosporin. It inhibits cell wall synthesis.

Ceftriaxone (Rocephin)

Paramedic

Special Notes:

Onset: Immediate

Adult Indications & Dosing

- **Fever/Suspected Sepsis**
 - 2 gm IV Infusion
Over 20 minutes

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Hypersensitivity, use caution in patients with history of sensitivity to penicillin

Adverse Reactions

- **CNS:** Headache, dizziness
- **GI:** Pseudomembranous colitis, nausea/vomiting, diarrhea, dysgeusia, abdominal cramps
- **Skin:** Rash, urticaria
- **Other:** Anaphylaxis, elevated temperature, injection site pain, tissue sloughing (with IV injection).

Precautions

- Use caution in individuals with history of gastrointestinal disease, especially colitis.

Medical Considerations

- None

Mechanism of Actions

- Antibiotic

Dextrose 10% (D10)

AEMT

Paramedic

Special Notes:

Onset: 1 - 2 minutes Peak Effect: N/A

Adult Indications & Dosing

- Pulseless Electrical Activity (PEA) Seizure Suspected Stroke Syncope
 - 5 - 10 gm IVP, IO D10% mixing (no premix available), Remove 50 mL of NS from 250 mL bag
Add 1 amp D50% to bag= D10% - IV until return to baseline mentation. Recheck Blood Glucose.
- Altered Mental Status
 - 5 - 10 gm IVP, IO D10% mixing (no premix available), Remove 50 mL of NS from 250 mL bag
Add 1 amp D50% to bag= D10% - IV until return to baseline mentation. Recheck Blood Glucose.

Pediatric Indications & Dosing

- Pediatric Newly Born
 - 0.1 - 0.2 gm/kg (0.1 gm/mL) IVP, IO
Maximum 25 gm (250 mL)
- Pediatric Altered Mental Status
 - 0.2 gm/kg (0.1 gm/mL) IVP, IO
Maximum 25 gm (250 mL)
 - 0.1 - 0.2 gm/kg (0.1 gm/mL) IVP, IO
Maximum 25 gm (250 mL)
- Pediatric Seizure
 - 0.2 gm/kg (0.1 gm/mL) IVP, IO
Maximum 25 gm (250 mL)
 - 0.1 - 0.2 gm/kg (0.1 gm/mL) IVP, IO
Maximum 25 gm (250 mL)

Contraindications

- Sub Q & IM injections
- Intercerebral bleeding
- Hemorrhagic CVA
- Cerebral edema
- Delirium Tremors if patient dehydrated

Adverse Reactions

- Febrile response
- Infection at injection site
- Tissue necrosis
- Venous thrombosis or phlebitis
- Extravasation
- Hypovolemia
- Dehydration
- Mental Confusion or unconsciousness

- May produce allergic reactions in corn-sensitive persons
- Use the largest available peripheral vein
- Rapid infusion may cause a generalized flush

Precautions

- Inject slowly so that extravasation does not occur. If thrombosis occurs, injection should be stopped.

Medical Considerations

- Do not use Dextrose if IV site is questionable. Perform blood glucose analysis prior to administration and 5-15 minutes after initial analysis.

Mechanism of Actions

- Natural sugar

Dextrose 25% (D25)

AEMT

Paramedic

Special Notes:

Onset: 1 - 2 minutes Peak Effect: N/A

Adult Indications & Dosing

- No adult doses for this medication.

Pediatric Indications & Dosing

- Pediatric Bradycardia Pediatric Hypotension/Shock Non-Trauma Pediatric Head Trauma
 - 0.25 - 0.5 mL/kg (0.25 mL/mL) Slow IVP
Maximum 25 gm (100 mL)
- Pediatric Pulseless Arrest
 - 0.25 - 0.5 gm/kg (0.25 gm/mL) Slow IVP, IO
Maximum 25 gm (100 mL)

Contraindications

- Sub Q & IM injections
- Intercerebral bleeding
- Hemorrhagic CVA
- Cerebral edema
- Delirium Tremors if patient dehydrated

Adverse Reactions

- Febrile response
- Infection at injection site
- Tissue necrosis
- Venous thrombosis or phlebitis
- Extravasation
- Hypovolemia
- Dehydration
- Mental Confusion or unconsciousness
- May produce allergic reactions in corn-sensitive persons
- Use the largest available peripheral vein
- Rapid infusion may cause a generalized flush

Precautions

- Inject slowly so that extravasation does not occur. If thrombosis occurs, injection should be stopped.

Medical Considerations

- Do not use Dextrose if IV site is questionable. Perform blood glucose analysis prior to administration and 5-15 minutes after initial analysis.

Mechanism of Actions

- Natural sugar

Dextrose 50% (D50)

AEMT

Paramedic

Special Notes:

Onset: 1 - 2 minutes Peak Effect: N/A

Adult Indications & Dosing

- Pulseless Electrical Activity (PEA) Altered Mental Status Seizure Suspected Stroke Syncope
 - 25 gm IVP, IO (50 mL)

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Sub Q & IM injections
- Intercerebral bleeding
- Hemorrhagic CVA
- Cerebral edema
- Delirium Tremors if patient dehydrated

Adverse Reactions

- Febrile response
- Infection at injection site
- Tissue necrosis
- Venous thrombosis or phlebitis
- Extravasation
- Hypovolemia
- Dehydration
- Mental Confusion or unconsciousness
- May produce allergic reactions in corn-sensitive persons
- Use the largest available peripheral vein
- Rapid infusion may cause a generalized flush

Precautions

- Inject slowly so that extravasation does not occur. If thrombosis occurs, injection should be stopped.

Medical Considerations

- Do not use Dextrose if IV site is questionable. Perform blood glucose analysis prior to administration and 5-15 minutes after initial analysis.

Mechanism of Actions

- Natural sugar

Diltiazem (Cardizem®)

Paramedic

Special Notes:

Onset: N/A Peak Effect: 2 - 3 hours

Adult Indications & Dosing

- **Atrial Fibrillation**
 - 10 mg Slow IVP
 - May repeat x 1
- **Supraventricular Tachycardia**
 - 10 mg Slow IVP
 - May repeat x 1

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Hypersensitivity
- Patients with sick sinus syndrome, 2nd or 3rd degree blocks, except with functioning ventricular pacemaker
- Severe hypotension or cardiogenic shock
- WPW, or short PR syndrome
- Patients with wide complex tachycardia, Acute MI, CHF

Adverse Reactions

- **Cardiovascular:** Hypotension, Chest Pain, CHF, Syncope, V-Fib, V-Tach, Ectopy
- **Neurological:** Dizziness, Headache
- **Other:** Itching or burning at injection site, Vasodilation (flushing), Asystole, A-V Block, Nausea, Vomiting, Edema

Precautions

- Use with caution in patients with a BP <110; consider ½ dose in these situations. If blood pressure remains adequate greater than 110 and heart rate remains >110, you may administer the other half of the initial loading bolus in 5 minutes.

Medical Considerations

- Do not mix with other drugs. Flush tubing after use. Following injection, response usually occurs within 3 minutes, rarely converting atrial fibrillation or atrial flutter to NSR, but decreases heart rate; lasting 1 to 3 hours.

Mechanism of Actions

- Calcium channel blocker. Decreases heart rate, Slows the ventricular rate in patients with rapid response during atrial fibrillation or atrial flutter.

Diphenhydramine (Benadryl®)

AEMT

Paramedic

Special Notes:

Onset: < 15 min. Peak Effect: 1 - 4 hours

Adult Indications & Dosing

- Abdominal Pain Vomiting/Diarrhea
 - 25 mg IVP
- Behavioral Emergency
 - 25 mg IVP, IM
- Allergic Reaction
 - 25 - 50 mg IVP, IM

Pediatric Indications & Dosing

- Pediatric Allergic Reaction
 - 1 mg/kg (50 mg/mL) IVP, IM
Maximum 25 mg (0.5 mL)

Contraindications

- Hypersensitivity
- Newborns
- Lactating females

Adverse Reactions

- **Cardiovascular:** Hypotension, Headache, Palpitations, Tachycardia, extrasystoles
- **CNS:** Sedation, Sleepiness, Dizziness, Fatigue, Confusion, Restlessness, Excitation, Nervousness, Tremor, Irritability, Blurred Vision, Vertigo, Tinnitus, Convulsions
- **Gastrointestinal:** Nausea, Vomiting, Diarrhea
- **Respiratory:** Thickening of Bronchial Secretions, Tightness of Chest and Wheezing, Nasal Stuffiness

Precautions

- Has Atropine-like action and should be used with caution in patients with a history of bronchial asthma, increased intraocular pressure, cardiovascular disease or hypertension.
- Use caution in patients with lower respiratory disease, including asthma. Also pregnant patients.
- Use caution in elderly patients, may cause dizziness, extreme calm and hypotension.

Medical Considerations

- Should be administered following Epinephrine 1 mg/1 mL in cases involving the respiratory system (stridor, wheezing, retractions).

Mechanism of Actions

- Antihistamine

Dopamine (Intropin)

Paramedic

Special Notes:

Onset: < 5 minutes Peak Effect: N/A

Adult Indications & Dosing

- Hypotension/Shock Non-Trauma Post Resuscitation Fever/Suspected Sepsis
 - 5 - 10 mcg/min IV Drip

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Tachyarrhythmias
- Ventricular Fibrillation

Adverse Reactions

- **Cardiovascular:** Headache, Tachycardia, Anginal Pain, Bradycardia, Hypertension, Hypotension, Palpitation, Widened QRS Complex, Ectopy
- **Neurological:** Anxiety
- **Gastrointestinal:** Nausea and Vomiting
- **Hematological:** Anemia
- **Respiratory:** Dyspnea

Precautions

- Duration of action is less than 10 minutes
- Must be given by IV drip
- Use in ventricular arrhythmias that are not corrected, must be done with caution
- Decrease pulse pressure
- Mix with no other drugs, Dopamine and Lasix = high urine output
- Acidosis decreases effectiveness of Dopamine
- Must dilute original solution, Phenytoin should not follow Dopamine use
- May result in profound hypotension and bradycardia

Medical Considerations

- Do not mix with other drugs. Must use infusion pump. Acidosis decreases effectiveness. Administer into large vein, infiltration will cause necrosis & sloughing.

Mechanism of Actions

- Increases heart rate & cardiac contractility

Droperidol (Inapsine®)

Paramedic

Special Notes:

Onset: 3 - 10 minutes IVP, IM Duration: 2 - 3 hours

Adult Indications & Dosing

- **Abdominal Pain Vomiting/Diarrhea**
 - 0.625 - 1.25 mg IVP
- **Behavioral Emergency**
 - 1.25 mg IVP, IM

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Suspected acute myocardial infarction/acute coronary syndrome.
- Hypotension
- Pregnancy
- Dementia related psychosis
- Patients < 18 years

Adverse Reactions

- Transient hypotension
- Dystonic reaction
- Extra-pyramidal reactions
- Sedation

Precautions

- Patients > 60 years of age
- Patients with known prolonged QT syndrome or recent simultaneous use of other QT-Prolonged drugs.

Medical Considerations

- May cause prolonged QT interval.
- All patients receiving droperidol should be placed on cardiac monitoring and EtCO2 monitoring.
- Contact OLMC if additional doses of droperidol or midazolam are needed for patients with continued agitation after first dose of droperidol.
- Usually combine with Diphenhydramine to limit.
- Extra-pyramidal reactions.

Mechanism of Actions

- Produces a dopaminergic blockage, a mild alpha-adrenergic blockage, and causes peripheral vasodilation.

DuoNeb™ (Albuterol, Ipratropium)

EMT

AEMT

Paramedic

Special Notes:

Onset: improvement within 5 min. Peak Effect: 2 hours

Adult Indications & Dosing

- **Respiratory Distress**
 - 3 - 0.5 mg NEB (3 mg Albuterol / 0.5 mg Ipratropium)

Pediatric Indications & Dosing

- **Pediatric Respiratory Distress**
 - 3 - 0.5 mg NEB (3 mg Albuterol / 0.5 mg Ipratropium)

Contraindications

- Hypersensitivity to any of its components, or to atropine and its derivatives

Adverse Reactions

- **Respiratory:** Bronchitis, Pharyngitis, Pneumonia
- **Musculo-Skeletal:** Leg Cramps
- **Digestive:** Diarrhea, Dyspepsia, Nausea
- **Urogenital:** UTI
- **Whole Body:** Pain, Chest Pain

Precautions

- DuoNeb should be used with caution in patients with cardiovascular disorders, especially coronary insufficiency, cardiac arrhythmias, and hypertension; in patients with convulsive disorders, hyperthyroidism, or diabetes mellitus.
- Due to the presence of ipratropium bromide in DuoNeb, it should be used with caution in patients with narrow-angle glaucoma, prostatic hypertrophy, or bladder-neck obstruction.
- Use caution in patients with hepatic or renal insufficiency.

Medical Considerations

- DuoNeb is supplied as a single-dose, ready-to-use vial containing 3 mL of solution. No mixing or dilution is needed.

Mechanism of Actions

- Bronchodilator, sympathomimetic/anticholinergic agent

Epinephrine 1 mg/1 mL

EMR - Auto-Injector

EMT- (IM & Auto-Injector only) for
Anaphylaxis

AEMT - (SQ, IM & Auto-Injector
only)

Paramedic

Special Notes:

Onset: 5 - 10 minutes SQ Peak Effect: N/A

Adult Indications & Dosing

- **Allergic Reaction**
 - 0.3 mg Auto-Injector
 - 0.5 mg IM
 - 0.3 mg IM, Auto-Injector
- **Respiratory Distress**
 - 0.5 mg NEB 0.5 mg = 0.5 mL
Mix with 3 mL NS
 - 0.5 mg IM

Pediatric Indications & Dosing

- **Pediatric Bradycardia**
 - 0.1 mg/kg (1 mg/mL) ET
Maximum 1 mg (1 mL)
- **Pediatric Pulseless Arrest**
 - 0.1 mg/kg (1 mg/mL) ET
Maximum 1 mg (1 mL)
- **Pediatric Allergic Reaction**
 - 0.01 mg/kg (1 mg/mL) IM
Maximum 0.5 mg (0.5 mL)
 - 0.01 mg/kg (1 mg/mL) IM
Maximum 0.5 mg (0.5 mL)
- **Pediatric Respiratory Distress**
 - 0.5 mg/kg (1 mg/mL) NEB
Maximum 5 mg (5 mL)
 - 0.5 mg NEB (0.5 mL) Mix in 3 mL NS
 - 0.01 mg/kg (1 mg/mL) IM
Maximum 0.5 mg (0.5 mL)
 - 0.01 mg/kg (1 mg/mL) SQ, IM
Maximum 0.3 mg (0.3 mL)

Contraindications

- None in Cardiac Arrest
- Known Hypersensitivity
- Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours

Adverse Reactions

- **Cardiovascular:** Palpitations, Arrhythmias, Hypertension
- **Respiratory:** Pulmonary Edema, Dyspnea
- **Neurological:** Nervousness

Precautions

- When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur
- Do not mix with any other drugs
- Very light sensitive, do not use solutions that are discolored or those that have a precipitate
- Massage site after injection to counteract possible vasoconstriction
- Use with caution on patients with Epi-Pen usage (previous).

Medical Considerations

- Always transport after treatment due to rebound effect. Use with caution in males over age 35 or in those patients with a known history of hypertension, thyroid disease, or angina.

Mechanism of Actions

- Sympathomimetic & Cardiac stimulant

Epinephrine 1 mg/10 mL

Paramedic

Special Notes:

Onset: < 5 minutes Peak Effect: N/A

Adult Indications & Dosing

- **Asystole** **Pulseless Electrical Activity (PEA)** **V-Fib/Pulseless V-Tach**
 - 1 mg IVP, IO Repeat every 10 minutes.
- **Allergic Reaction** **Respiratory Distress**
 - 100 mcg IVP Give 100 mcg = 1 mL every minute until MAP >65 or symptoms improve.
- The following doses are not indicated in Protocol pages:
 - 0.3 mg NEB Mix with 3 mL NS
 - 0.1 mg IVP
 - 0.1 mL = 100 mcg every 1 minute until symptoms/hemodynamics improve.

Pediatric Indications & Dosing

- **Pediatric Bradycardia**
 - 0.01 mg/kg (0.1 mg/mL) IVP, IO
Maximum 1 mg (10 mL)
- **Pediatric Pulseless Arrest**
 - 0.01 mg/kg (0.1 mg/mL) IVP, IO
Maximum 1 mg (10 mL)
- **Pediatric Allergic Reaction**
 - 0.01 mg/kg (0.1 mg/mL) IVP PRN
Maximum 0.3 mg (3 mL)

Contraindications

- None in Cardiac Arrest
- Known Hypersensitivity
- Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours

Adverse Reactions

- **Cardiovascular:** Palpitations, Arrhythmias, Hypertension
- **Respiratory:** Pulmonary Edema, Dyspnea
- **Neurological:** Nervousness

Precautions

- When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur
- Do not mix with any other drugs
- Very light sensitive, do not use solutions that are discolored or those that have a precipitate
- Massage site after injection to counteract possible vasoconstriction
- Use with caution on patients with Epi-Pen usage (previous).

Medical Considerations

- None

Mechanism of Actions

- Sympathomimetic & Cardiac stimulant

Epinephrine Drip

Paramedic

Special Notes:

Onset: < 5 minutes

Adult Indications & Dosing

- **Bradycardia** **Hypotension/Shock Non-Trauma** **Post Resuscitation** **Fever/Suspected Sepsis**
 - **Epinephrine Drip**
1 mg IV Drip
Add 1 mg Epinephrine (1 mg/10 mL) to 1 Liter NS.
Administer **wide open** until Map >65 mmHg.
Once target BP achieved, slow drip to **KVO**

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- None in Cardiac Arrest
- Known Hypersensitivity
- Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours

Adverse Reactions

- Cardiovascular: Palpitations, Arrhythmias, Hypertension
- Respiratory: Pulmonary Edema, Dyspnea
- Neurological: Nervousness

Precautions

- When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur
- Do not mix with any other drugs
- Very light sensitive, do not use solutions that are discolored or those that have a precipitate
- Massage site after injection to counteract possible vasoconstriction
- Use with caution on patients with Epi-Pen usage (previous).

Medical Considerations

- None

Mechanism of Actions

- Sympathomimetic & Cardiac stimulant

Epinephrine Drip - Medical Reference

Paramedic

Special Notes:

Onset: Half Life: Peak Effect:

Adult Indications & Dosing

- **Bradycardia** **Hypotension/Shock Non-Trauma** **Post Resuscitation** **Fever/Suspected Sepsis**
 - **Epinephrine Drip**
1 mg IV Drip
Add 1 mg Epinephrine (1 mg/10 mL) to 1 Liter NS.
Administer **wide open** until Map >65 mmHg.
Once target BP achieved, slow drip to **KVO**

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- None in Cardiac Arrest
- Known Hypersensitivity
- Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours

Adverse Reactions

- Cardiovascular: Palpitations, Arrhythmias, Hypertension
- Respiratory: Pulmonary Edema, Dyspnea
- Neurological: Nervousness

Precautions

- When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur
- Do not mix with any other drugs
- Very light sensitive, do not use solutions that are discolored or those that have a precipitate
- Massage site after injection to counteract possible vasoconstriction
- Use with caution on patients with Epi-Pen usage (previous).

Medical Considerations

- None

Mechanism of Actions

- Sympathomimetic & Cardiac stimulant

Epinephrine Push Dose

Paramedic

Special Notes:

Onset: Immediate Peak Effect: N/A

Adult Indications & Dosing

- Hypotension/Shock Non-Trauma Post Resuscitation Fever/Suspected Sepsis Adult Rapid Sequence Intubation (RSI) Procedure Adult Rapid Sequence Intubation (RSI) Checklist
 - 10 - 20 mcg IVP Mix 1 mL Epinephrine (1 mg/10 mL) with 9 mL Normal Saline and mix syringe
Administer every 3 minutes until MAP >65

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Known Hypersensitivity
- Glaucoma

Adverse Reactions

- **Neurological:** Anxiety, Headache, Fear
- **Cardiovascular:** Palpitations
- Repeated injections can result in necrosis at injection sites

Precautions

- Quantities in excess of 50 mcg/min can potentially cause end-organ damage

Medical Considerations

- Remember: push dose is a short-term bridge to IV drip and is not intended for prolonged use (notify the receiving facility as soon as possible of the use of push dose epinephrine).

Mechanism of Actions

- Sympathomimetic & Cardiac stimulant

Etomidate (Amidate™)

Paramedic

Special Notes:

Onset: 1 minute Duration: 5 - 7 minutes

Adult Indications & Dosing

- Adult Rapid Sequence Intubation (RSI) Procedure Adult Rapid Sequence Intubation (RSI) Checklist
 - 0.3 mg/kg (2 mg/mL) IVP, IO**Maximum dose 30 mg (15 mL)**

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Hypersensitivity
- Use caution in elderly patients

Adverse Reactions

- Averting, Tonic, Clonic movements
- Laryngospasm
- Apnea, Hyperventilation, Hypoventilation
- Hypertension, Hypotension, Tachycardia, Bradycardia
- Nausea and Vomiting

Precautions

- Very safe in the unstable patient
- Onset is predictable and rapid (i.e.: arm to brain)
- No analgesic side effects
- Commonly used in combination with an analgesic
- Excellent hemodynamic stability
- Reduces intracranial pressure
- Side effect of Myoclonus should be anticipated, but will not interfere with intubation efforts

Medical Considerations

- None

Mechanism of Actions

- Hypnotic, Sedative

Fentanyl (Sublimaze®)

AEMT - (Pain control only)

Paramedic

Special Notes:

Onset: Almost immediate. Maximal analgesic & respiratory effect may take several minutes.

Adult Indications & Dosing

- **Chest Pain**
 - 25 - 100 mcg IVP, IN
- **Pain Control**
 - 50 - 100 mcg IVP, IM, IN
- **Adult Rapid Sequence Intubation (RSI) Procedure** **Adult Rapid Sequence Intubation (RSI) Checklist**
 - 100 mcg IVP, IO
Maximum 200 mcg
- **Head Trauma**
 - 100 - 200 mcg IVP
- The following doses are not indicated in Protocol pages:
 - 2 mcg/kg (50 mcg/mL) IVP

Pediatric Indications & Dosing

- **Pediatric Pain Control**
 - 0.5 - 1 mcg/kg (50 mcg/mL) IVP, IN
- **Pediatric Burns**
 - 0.5 - 1 mcg/kg (50 mcg/mL) IVP, IN, IO

Contraindications

- Known intolerance to drug

Adverse Reactions

- **Respiratory:** Respiratory Depression, Apnea, Laryngospasm
- **Cardiovascular:** Bradycardia, Hypertension, Hypotension
- **CNS:** Dizziness, Blurred Vision
- **Gastrointestinal:** Nausea & Vomiting
- **Other:** Rigidity, Diaphoresis

Precautions

- Use caution in patients with head injuries and elevated ICP.
- Use caution with bradycardia, COPD, and decreased respiratory reserve patients.
- Also, patients using narcotics.
- Fentanyl should be reduced in elderly and debilitated patients.
- Also, patients with elevated BP with or without pre-existing hypertension.
- Fentanyl in high doses can result in "stiff chest" with an inability to ventilate the patient. Stiff chest is treated with IV succinylcholine and intubation.

Medical Considerations

- Use caution when administering Fentanyl to elderly and debilitated patients, or patients with limited pulmonary reserve.

Mechanism of Actions

- Narcotic analgesic

Glucagon (GlucaGen®)

EMT

AEMT

Paramedic

Special Notes:

Onset: Patient should respond within 15 minutes

Adult Indications & Dosing

- Pulseless Electrical Activity (PEA)
 - 1 mg IVP
- Altered Mental Status Seizure Suspected Stroke Syncope
 - **If no IV access**
1 mg IM, IN

Pediatric Indications & Dosing

- Pediatric Bradycardia Pediatric Hypotension/Shock Non-Trauma Pediatric Seizure Pediatric Head Trauma
 - 0.025 mg/kg (1 mg/mL) IM
Maximum 1 mg (1 mL)
- Pediatric Altered Mental Status
 - 0.025 mg/kg (1 mg/mL) IM
Maximum 1 mg (1 mL)
- Pediatric Overdose/Toxic Exposure
 - 0.025 mg/kg (1 mg/mL) IVP
Maximum 1 mg (1 mL)

Contraindications

- Hypersensitivity
- Hyperglycemia
- Allergies to beef or porcine proteins
- Insulinoma
- Patients with adrenal gland tumor

Adverse Reactions

- Nausea, Vomiting

Precautions

- Glucagon is of little help in patients with adrenal insufficiency. Administration of Glucagon should be followed by supplemental carbohydrates.

Medical Considerations

- Do not mix with saline

Mechanism of Actions

- Anti-hypoglycemic

Ipratropium (Atrovent®)

EMT

AEMT

Paramedic

Special Notes:

Onset: N/A, Peak effect: 1.5 - 2 hours

Adult Indications & Dosing

- No adult doses for this medication.

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Allergy to soy or peanut products
- Glaucoma
- Suspected hypersensitivity to Ipratropium Bromide or to Atropine and/or its derivatives
- Caution in OB patients

Adverse Reactions

- Dry mouth
- Headache
- Cough
- Nausea, Vomiting
- Dizziness, Nervousness, Palpitations
- Glaucoma patients may experience pain or blurred vision if contact with eyes

Precautions

- May cause bronchoconstriction to worsen. This is thought to be related to the hypotonicity of the solution or to additives, such as benzalkonium chloride. It is for this reason that beta-adrenergic agonists should be given first or in combination with ipratropium bromide. Use caution in patients with narrow angle glaucoma, prostatic obstruction

Medical Considerations

- None

Mechanism of Actions

- Bronchodilator

Ketamine (Ketalar®)

AEMT

Paramedic

Special Notes:

Onset: IV 30 seconds – 2 minutes, IM 3 – 4 minutes

Adult Indications & Dosing

- Atrial Fibrillation Supraventricular Tachycardia Ventricular Tachycardia/Wide Complex w/Pulse
 - 25 mg Slow IVP
 - Dilute in 10 mL NS
- Bradycardia Pulmonary Edema
 - 25 mg Slow IVP
 - Dilute in 10 mL NS. May repeat x 1.
- Post Resuscitation
 - **For awareness during active CPR.**
 - 100 mg IVP, IO
 - May repeat x 1
- Pain Control
 - 25 mg IVP
 - Mix in 10 mL NS, give over 10 minutes.
 - May repeat x 1.
- Behavioral Emergency
 - 4 mg/kg (50 mg/mL) IM, IN
- Seizure
 - **Continuous Seizure after Midazolam (Versed)?**
 - 100 mg IVP, IO
 - May repeat x 1
- Adult Airway Head Trauma
 - 1 - 2 mg/kg/hr IV Infusion
- Adult Rapid Sequence Intubation (RSI) Procedure Adult Rapid Sequence Intubation (RSI) Checklist
 - 2 mg/kg (50 mg/mL) IVP
 - Maximum dose 200 mg (4 mL)**
 - 0.5 mg/kg (50 mg/mL) IVP
 - Maximum dose 50 mg (1 mL)**
 - 1 - 2 mg/kg/hr IV Infusion

Pediatric Indications & Dosing

- Pediatric Pain Control
 - 0.2 mg/kg (50 mg/mL) IVP
 - Mixed in 10 mL NS over 10 minutes
 - May repeat x 1.
- Pediatric Seizure
 - 1 mg/kg (50 mg/mL) IVP, IO
- Pediatric Burns
 - 0.2 mg/kg (50 mg/mL) Slow IVP

Contraindications

- Those whom a significant elevation of blood pressure would constitute a serious hazard
- Those who have shown hypersensitivity to the drug

Adverse Reactions

- **Cardiovascular:** BP and pulse rate are frequently elevated following administration. Hypotension and bradycardia have been observed. Arrhythmia has also occurred
- **Gastrointestinal:** Nausea / vomiting; increased salivation
- **Neurological:** Enhanced skeletal muscle tone may be manifested by tonic and clonic movements sometimes resembling seizures
- **Respiratory:** Although respiration is frequently stimulated, severe depression of the respiration or apnea may occur following rapid IV administration of high doses. Laryngospasms and other forms of airway obstruction have occurred

Precautions

- Resuscitative equipment should be ready for use. IV dose should be administered over 1 minute. More rapid administration may result in respiratory depression or apnea and enhanced pressor response. Use caution in the chronic alcoholic and the acutely alcohol-intoxicated patient.

Medical Considerations

- Monitor vital signs frequently. Use caution with elderly and pediatric patients and use the low end of the dosing range.

Mechanism of Actions

- Non-barbiturate anesthetic

Labetalol (Trandate®)

Paramedic

Special Notes:

Onset: 30 - 90 seconds

Adult Indications & Dosing

- **Hypertension**
 - 20 mg IVP Avoid with Bradycardia. May repeat x1 in 10 minutes.
- **Obstetrical Emergency**
 - 20 mg IVP
May repeat x 1.

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Bronchial asthma
- Overt cardiac failure
- Greater than first degree block
- Cardiogenic shock
- Severe bradycardia
- Other conditions associated with severe and prolonged hypotension
- Patients with a history of hypersensitivity
- Beta-blockers, even those with apparent cardioselectivity, should not be used in patients with a history of obstructive airway disease, including asthma

Adverse Reactions

- **Cardiovascular:** Ventricular arrhythmia
- **CNS & Peripheral System:** Dizziness, tingling of the scalp/skin, hypoesthesia (numbness) and vertigo
- **Gastrointestinal:** Nausea, vomiting, dyspepsia (epigastric discomfort)
- **Metabolic Disorders:** Transient increases in blood urea nitrogen and serum creatinine levels occurred, associated with drops in BP, generally in patients with prior renal insufficiency
- **Psychiatric:** Somnolence/yawning
- **Respiratory:** Wheezing

Precautions

- Impaired hepatic function may diminish metabolism of labetalol. Following coronary artery bypass surgery in one uncontrolled study, patients with low cardiac indices and elevated systemic vascular resistance following IV injection experienced significant declines in cardiac output with little change in systemic vascular resistance. High dose labetalol, several patients experienced hypotension and bradycardia.

Medical Considerations

- None

Mechanism of Actions

Lactated Ringers

AEMT

Paramedic

Special Notes:

Onset: Immediate

Adult Indications & Dosing

- Hyperthermia Hypothermia
 - 1 L Fluid Bolus
- Abdominal Pain
 - 20 mL/kg Fluid Bolus
- Adult IV/IO Epistaxis
 - 500 mL Fluid Bolus
- Fever/Suspected Sepsis
 - 2 Liters Fluid Bolus
- Burns
 - 500 mL/hr IV Infusion

Pediatric Indications & Dosing

- Pediatric Vomiting/Diarrhea
 - 20 mL/kg Fluid Bolus, IVP PRN
 - 10 mL/kg Fluid Bolus If Blood Glucose > 250 mg/dL
- Pediatric Hypotension/Shock Non-Trauma Pediatric IV/IO
 - 20 mL/kg Fluid Bolus, IVP PRN
- Pediatric Altered Mental Status
 - 10 mL/kg Fluid Bolus If Blood Glucose > 250 mg/dL
- Pediatric Burns
 - 20 mL/kg Fluid Bolus
 - Not to exceed 500 mL/hr.

Contraindications

- Severe metabolic acidosis or alkalosis, and in severe liver disease or anoxic states which affect lactate metabolism.

Adverse Reactions

- Allergic reactions or anaphylactoid symptoms such as localized or generalized urticaria and pruritus; periorbital, facial, and/or laryngeal edema; coughing, sneezing, and/or difficulty with breathing have been reported during administration of Lactated Ringer's.

Precautions

- Use with care in patients with hypervolemia, renal insufficiency, urinary tract obstruction, or impending or frank cardiac decompensation. If infused in large amounts, chloride ions may cause a loss of bicarbonate ions, resulting in an acidifying effect.

Medical Considerations

- None

Mechanism of Actions

- A sterile, nonpyrogenic solution for fluid and electrolyte replenishment

Lidocaine (Xylocaine®)

AEMT - (for pain relief after 10 needle insertion)

Paramedic

Special Notes:

Onset: 30 - 90 seconds

Adult Indications & Dosing

- **Ventricular Tachycardia/Wide Complex w/Pulse**
 - 1 - 1.5 mg/kg (20 mg/mL) IVP, IO
 - 0.5 - 0.75 mg/kg (20 mg/mL) IVP, IO Every 5 - 10 minutes.
 - **Maximum 3 mg/kg**
3 mg/kg (20 mg/mL) IVP, IO
- **V-Fib/Pulseless V-Tach**
 - 1 - 1.5 mg/kg (20 mg/mL) IVP, IO
 - 0.5 - 0.75 mg/kg (20 mg/mL) IVP, IO Every 5 - 10 minutes.
- **Adult IV/IO Vascular Access-Intraosseous**
 - For Pain with IO
40 mg IO (2 mL) over 120 seconds.
Flush IO catheter with 5 - 10 mL NS

Pediatric Indications & Dosing

- **Pediatric Pulseless Arrest**
 - 1 mg/kg (20 mg/mL) IVP, IO
- **Pediatric IV/IO Vascular Access-Intraosseous**
 - For Pain with IO
0.5 mg/kg (20 mg/mL) IO (2 mL) Over 120 seconds.
Flush IO catheter with 2 - 5 mL NS
Not to exceed 40 mg

Contraindications

- Bradycardia
- 2nd or 3rd degree heart block
- Known hypersensitivity
- Stokes-Adams syndrome
- WPW

Adverse Reactions

- Drowsiness
- Vomiting
- Confusion
- Seizures
- Hypotension
- Bradycardia
- Slurred speech
- Tremors
- Restlessness

- Euphoria
- Hypotension
- Tinnitus
- Blurred, or double vision

Precautions

- Contraindicated if allergic to other amide type anesthetics such as Nupercaine. Caution in patients with greater than second degree heart block. DC drug if signs of toxicity appear (i.e.: dizziness, convulsions or confusion. Convulsions may be the first sign of toxicity). Use in caution in patients with digitalis toxicity.

Medical Considerations

- Observe closely for drug toxicity. Signs include: dizziness, confusion, delirium, seizures

Mechanism of Actions

- Anti-arrhythmic

Magnesium Sulfate

Paramedic

Special Notes:

Onset: immediate Half Life: N/A Peak Effect: Lasts about 30 minutes

Adult Indications & Dosing

- **V-Fib/Pulseless V-Tach**
 - 2 gm IVP, IO
- **Obstetrical Emergency**
 - 4 gm Slow IVP Over 10 - 20 minutes.
- **Respiratory Distress**
 - 2 gm IVP Over 20 minutes

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Heart block or myocardial damage
- Hypertension
- Caution with renal impairment
- **Caution:** Reduce dosing with concurrent narcotics and/or hypnotics

Adverse Reactions

- **Respiratory:** Respiratory depression, Respiratory paralysis
- **Circulatory:** Hypotension, Circulatory collapse
- **Other:** Hypothermia, Diaphoresis, Facial flushing, Sweating, Depressed reflexes

Precautions

- Use caution on renal impairment patients because drug is solely removed by the kidneys.
- Clinical indications of a safe dosage regimen include the presence of the patellar reflex (knee jerk) and absence of respiratory depression.
- When barbiturates, narcotics, or other hypnotics are given in conjunction with Magnesium, their dosage should be adjusted because of the additive central depressive effects.
- Use caution in patients receiving digitalis.
- **Stop infusion if hypotension develops, difficulty breathing, decreased deep tendon reflexes or paralysis.**

Medical Considerations

- Not compatible with Sodium Bicarbonate

Mechanism of Actions

- Magnesium is a physiological calcium channel blocker and blocks neuromuscular transmission.

Methylprednisolone (Solu-Medrol®)

Paramedic

Special Notes:

Onset: 1 – 2 hours Half Life: N/A Peak Effect: N/A

Adult Indications & Dosing

- Allergic Reaction Respiratory Distress
 - 125 mg IVP, IM

Pediatric Indications & Dosing

- Pediatric Allergic Reaction
 - 1 mg/kg (62.5 mg/mL) IVP, IM
Maximum 125 mg (1 mL)
- Pediatric Respiratory Distress
 - 1 - 2 mg/kg (62.5 mg/mL) IVP
Maximum 125 mg (1 mL)

Contraindications

- There are no contraindications, precautions, or side effects associated with a single dose used in emergencies.

Adverse Reactions

- **Fluid & Electrolyte Disturbances:** CHF in susceptible patients, HTN
- **Musculoskeletal:** Weakness
- **Neurological:** Convulsions, headache, vertigo
- **Metabolic:** Nausea & vomiting
- **Cardiovascular:** Arrhythmias, hypotension
- **Skin:** Sweating

Precautions

- Nonspecific ulcerative colitis, impending perforation or abscess or other infection.
- Peptic ulcer, renal insufficiency, hypertension, osteoporosis, myasthenia gravis (weakness of muscles).

Medical Considerations

- None

Mechanism of Actions

- Anti-inflammatory steroid.

Midazolam (Versed®)

AEMT

Paramedic

Special Notes:

Onset: 2 - 5 minutes

Adult Indications & Dosing

- Atrial Fibrillation Supraventricular Tachycardia Bites and Envenomations
 - 2 - 5 mg IVP
- Bradycardia Adult Airway
 - 2 - 5 mg IVP, IO
- Ventricular Tachycardia/Wide Complex w/Pulse
 - 2.5 - 5 mg IVP, IM, IN
- Hyperthermia
 - 2 mg IVP
 - 5 mg IM
 - 5 mg IN
- Behavioral Emergency
 - 2 - 5 mg IVP, IM, IN
 - 10 mg IM
 - 2 - 5 mg IVP, IM
- Seizure
 - **For age < 65**
10 mg IM
 - **For age > 65**
5 mg IM
- Obstetrical Emergency
 - 2 - 5 mg Slow IVP
- Adult Rapid Sequence Intubation (RSI) Procedure Adult Rapid Sequence Intubation (RSI) Checklist Head Trauma
 - 2.5 - 5 mg IVP, IO
- Pulmonary Edema
 - 2 - 5 mg IVP
 - 2 mg IN

Pediatric Indications & Dosing

- Pediatric Supraventricular Tachycardia
 - 0.1 mg/kg (5 mg/mL) IVP, IN
Maximum 2 mg (0.4 mL)
- Pediatric Seizure
 - 0.05 - 0.1 mg/kg (5 mg/mL) IVP
Maximum 5 mg/dose (5 mL)

- 0.2 mg/kg (5 mg/mL) IM, IN
Maximum 5 mg/dose (1 mL)

- **Pediatric Head Trauma**

- 0.1 mg/kg (5 mg/mL) IVP For sedation if intubated
Maximum 5 mg (1 mL)

Contraindications

- Hypersensitivity
- Pregnancy
- Nursing mothers
- Renal failure
- Shock
- Glaucoma
- Acute alcoholic intoxication with depressed vital signs

Adverse Reactions

- Apnea
- Respiratory depression
- Hypoxia
- Decreased tidal volume
- Fluctuations in vital signs
- Dysrhythmias
- Hypotension if pushed too fast
- Euphoria
- Confusion
- Nausea, Vomiting
- Headache
- Hiccups

Precautions

- Not recommended in pregnancy; refer to Magnesium Sulfate for Eclampsia.

Medical Considerations

- Consider reducing the dose on elderly & debilitated patients. These patients may take longer to recover from the drug. **Monitor respiratory status.**

Mechanism of Actions

- Sedative, Amnesic, Short acting benzodiazepine CNS depressant

Morphine

AEMT

Paramedic

Special Notes:

Onset: 2 - 3 minutes

Adult Indications & Dosing

- **Pain Control**
 - 2 - 5 mg IVP, IM

Pediatric Indications & Dosing

- **Pediatric Pain Control**
 - 0.1 mg/kg (10 mg/mL) IVP, IM
Maximum Single dose 2 mg
- **Pediatric Burns**
 - 0.1 mg/kg (10 mg/mL) IVP
Maximum 2 mg per dose (0.2 mL)

Contraindications

- Hypersensitivity
- Significant hypotension
- Acute abdominal conditions
- Multisystem trauma
- Head injury
- Convulsive disorders
- Hypovolemia
- Asthma
- Pregnancy

Adverse Reactions

- **Major Hazards:** Respiratory Depression and lesser degree circulatory depression. Respiratory Arrest, Shock, and Cardiac Arrest have occurred, particularly with overdose or rapid IV administration.
- **Cardiovascular:** Tachycardia, Bradycardia, Palpitation, Faintness, Syncope, and Orthostatic Hypotension
- **CNS:** Euphoria, Dysphasia, Weakness, Headache, Agitation, Tremor, Uncoordinated muscle movements, Hallucinations and Disorientation, Visual Disturbances
- **Allergic:** Reactions to Opiates, Urticaria, Anaphylactic Reactions
- **Other:** Face Sweating, Local Tissue Irritation, and Pain

Precautions

- Systolic BP at least 90 mmHg (may need to manage with fluid bolus).
- Watch for respiratory depression and be prepared to support ventilations. Narcan® should be readily available when administering Morphine.

Medical Considerations

- Administer slowly to avoid nausea & vomiting.
- **Antidote:** Administer Narcan 2 mg IVP, to reverse effects of morphine if necessary.
- Use with caution with the elderly.

Mechanism of Actions

- Narcotic (Opiate) agonist

Nalbuphine (Nubain®)

AEMT

Paramedic

Special Notes:

Onset: IV 2 - 3 minutes, IM < 15 minutes

Adult Indications & Dosing

- **Pain Control**
 - 5 mg IVP
 - 10 mg IM

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Hypersensitivity
- Patients physically dependent on opioids and who have not been detoxified

Adverse Reactions

- **Respiratory:** Respiratory Depression, Apnea, Laryngospasm
- **Cardiovascular:** Bradycardia, Hypertension, Hypotension
- **CNS:** Dizziness, blurred vision, headache, sedation
- **Gastrointestinal:** Nausea & Vomiting, dry mouth
- **Skin:** Sweating
- **Other:** Rigidity, Diaphoresis

Precautions

- Head trauma, increased ICP, severe renal, hepatic, or pulmonary disease, hypothyroidism, adrenal insufficiency, alcoholism, undiagnosed abdominal pain.

Medical Considerations

- May be reversed with Narcan

Mechanism of Actions

- Narcotic analgesic

Naloxone (Narcan®)

EMR - (IN & Auto-Injector only)

EMT - (IN & Auto-Injector only)

AEMT

Paramedic

Special Notes:

Onset: 2 minutes

Adult Indications & Dosing

- Altered Mental Status
 - 2 mg IN
 - 2 mg IVP, IN
 - 2 mg Slow IVP, IN, IM
- Overdose/Toxic Ingestion
 - 2 mg IN
 - 0.4 - 2 mg IVP

Pediatric Indications & Dosing

- Pediatric Bradycardia
 - 0.2 mg/kg (1 mg/mL) IVP, IM, IN, IO PRN
Maximum 2 mg (2 mL)
- Pediatric Pulseless Arrest
 - 0.1 mg/kg (1 mg/mL) IVP, IO, ET
Maximum 2 mg (2 mL)
- Pediatric Newly Born
 - 0.1 mg/kg (1 mg/mL) IVP, IO
Maximum 2 mg (2 mL)
- Pediatric Altered Mental Status
 - 0.1 mg/kg (1 mg/mL) IVP, IN, IM
Maximum 2 mg (2 mL)
 - 0.1 mg/kg (1 mg/mL) IVP, IM, IN, ET
Maximum 2 mg (2 mL)
- Pediatric Overdose/Toxic Exposure
 - 0.1 mg/kg (1 mg/mL) IN
Maximum 2 mg (2 mL)
 - 0.1 mg/kg (1 mg/mL) IVP, IN, IM
Maximum 2 mg (2 mL)

Contraindications

- Known hypersensitivity

Adverse Reactions

- Increased BP
- Tachycardia
- Projectile vomiting
- Tremors
- Seizures (possibly an opiate addiction withdrawal symptom)
- Dysrhythmias
- Cardiac arrest

Precautions

- Nausea, Vomiting
- Sweating
- Tachycardia
- Increased Blood Pressure
- Tremulousness
- Seizures
- Cardiac Arrest

Medical Considerations

- Short half-life. Effects last 1-4 hours, patients should be watched closely. Narcotic effect will often outlast the antagonist actions. Subsequent IM dose will prolong IV effects.

Mechanism of Actions

- Narcotic antagonist - Reverses the effects of opiates including respiratory depression.

Nitroglycerin (Nitrostat®)

EMT- Patient assisted

AEMT

Paramedic

Special Notes: EMT Patient assisted definition: May assist with 1) patient's prescription upon patient request and with written protocol – OR –2) EMS-provided medications with verbal medical direction.

Onset: 2 minutes

Adult Indications & Dosing

- **Chest Pain Hypertension**
 - 0.4 mg SL Tablet/Spray. Every 5 minutes if SBP > 90
- **Pulmonary Edema**
 - 0.4 mg SL Tablet/Spray. Every 2 - 3 minutes if SBP > 110

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Known hypersensitivity
- Pericardial tamponade
- Restrictive cardiomyopathy
- Constrictive pericarditis
- Do not administer Nitroglycerin if the following medications were taken, until after hours stated:
 - Cialis - 48 hours
 - Levitra - 24 hours
 - Viagra - 24+ hours

Adverse Reactions

- Headache
- Orthostatic hypotension
- Dizziness
- Weakness
- Palpitations
- Nausea & vomiting

Precautions

- Contraindicated in head trauma.
- Use caution in any patient whom is intoxicated.
- Be sure to remove any transdermal system before defibrillation.

Medical Considerations

- Check for transdermal patch prior to initiating spray/tablet.

Mechanism of Actions

- Antianginal agent (coronary vasodilator)

Norepinephrine (Levophed®)

Paramedic

Special Notes:

Pharmacologic Action: Strong beta-1 and alpha-adrenergic effects and moderate beta-2 effects, which increase cardiac output and heart rate, decrease renal perfusion and peripheral vascular resistance, and cause variable BP effects

Adult Indications & Dosing

- Hypotension/Shock Non-Trauma Post Resuscitation Fever/Suspected Sepsis
 - 0.1 - 0.5 mcg/kg/min IV Drip

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Hypersensitivity
- Hypotension due to blood volume deficit
- Peripheral vascular thrombosis (except for lifesaving procedures)
- **Relative Contraindications:** Concomitant use with some general anesthetics: chloroform, trichloroethylene, cyclopropane, halothane
- **Warning:** Norepinephrine is a vesicant and can cause severe tissue damage if extravasation occurs. Do not use in the same IV line as alkaline solutions as these may deactivate it.

Adverse Reactions

- **Cardiovascular:** Hypertension, ventricular arrhythmia, bradycardia
- **Neurological:** Headache
- **Dermal:** Necrosis if the drug extravasates

Precautions

- **Norepinephrine (Levophed)** causes tissue necrosis if infused into the interstitial space. Use large veins and verify IV patency prior to administration of
- Do not interrupt the infusion of Norepinephrine (Levophed) to ensure a consistent therapeutic blood level, establish an additional venous access site for the administration of fluids or additional medications.
- **Norepinephrine (Levophed)** is inactivated by **Sodium Bicarbonate**. Do not administer **Sodium Bicarbonate** in the same IV line with Norepinephrine (Levophed).

Medical Considerations

- Prefer central line administration but may temporarily give through large bore IV that flushes well. Monitor closely for extravasation.

Mechanism of Actions

- Alpha/beta adrenergic agonist

Normal Saline (0.9% NaCl)

AEMT

Paramedic

Special Notes:

Onset: N/A

Adult Indications & Dosing

- Hypotension/Shock Non-Trauma
 - 500 mL
 - 20 mL/kg
- Post Resuscitation Hyperthermia Hypothermia Altered Mental Status Behavioral Emergency
 - 1 L Fluid Bolus
- Abdominal Pain
 - 20 mL/kg
- Vomiting/Diarrhea Adult IV/IO Epistaxis Obstetrical Emergency
 - 500 mL
- Fever/Suspected Sepsis
 - 2 Liters Fluid Bolus
- Respiratory Distress
 - 3 mL NEB
- Burns
 - 500 mL/hr IV Infusion

Pediatric Indications & Dosing

- Pediatric Bradycardia Pediatric Pulseless Arrest Pediatric Hypotension/Shock Non-Trauma Pediatric IV/IO Pediatric Newly Born
 - 20 mL/kg Fluid Bolus Repeat as needed.
- Pediatric Vomiting/Diarrhea Pediatric Altered Mental Status
 - 20 mL/kg Fluid Bolus Repeat as needed.
 - 10 mL/kg Fluid Bolus If Blood Glucose > 250 mg/dL
- Pediatric Respiratory Distress
 - 3 mL NEB
- Pediatric Burns
 - 20 mL/kg Fluid Bolus
 - Not to exceed 500 mL/hr.

Contraindications

- None known

Adverse Reactions

- Reactions which may occur because of the solution or the technique of administration include febrile response, infection at the site of injection, venous thrombosis or phlebitis extending from the site of injection, extravasation, and hypervolemia. If adverse reaction does

occur, discontinue infusion.

Precautions

- Geriatric use: In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or drug therapy.
- Do not administer unless solution is clear and seal is intact.

Medical Considerations

- None

Mechanism of Actions

- Nonpyrogenic solution for fluid and electrolyte replacement

Ondansetron (Zofran®)

EMT-ODT Only, patients age 12 years and older

AEMT-Patients age 4 years or older

Paramedic

Special Notes:

Onset: Rapid Peak effect: 15 – 30 minutes

Adult Indications & Dosing

- Chest Pain Abdominal Pain Vomiting/Diarrhea Eye Injury/Complaint
 - 4 mg IVP, IM, ODT
 - 4 mg ODT
- EMT: May administer for patients age 12 years or older.

Pediatric Indications & Dosing

- Pediatric Vomiting/Diarrhea
 - 0.2 mg/kg (2 mg/mL) IVP, ODT
Maximum 4 mg (2 mL)
 - 4 mg ODT

Contraindications

- Hypersensitivity

Adverse Reactions

- **Cardiovascular:** Angina, Electrocardiographic Alterations, Hypotension, Tachycardia, Syncope, Palpitations
- **Neurological:** Extrapyrarnidal reactions, Grand Mal Seizure, Dizziness, Lightheadedness
- **General:** Flushing
- **Local Reactions:** Pain, Redness, Burning at site of injection
- **Other:** Hypokalemia, Hiccups

Precautions

- Not a drug that stimulates gastric or intestinal peristalsis. Transient ECG changes including QT interval prolongation.

Medical Considerations

- Do not use in 1st TM pregnancy

Mechanism of Actions

- Antiemetic

Oral Glucose

EMT

AEMT

Paramedic

Special Notes:

Onset: 1 - 2 minutes

Adult Indications & Dosing

- **Altered Mental Status**
 - 15 gm PO If airway not compromised.

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Do not administer to unconscious person or unable to swallow

Adverse Reactions

- N/A

Precautions

- N/A

Medical Considerations

- None

Mechanism of Actions

- Natural sugar

Oxygen (O2)

EMR

EMT

AEMT

Paramedic

Special Notes:

Onset: Immediate

Adult Indications & Dosing

- 2 - 6 LPM via nasal cannula
- 10 - 15 LPM via non-rebreather mask
- 10 - 15 LPM or greater via BVM / ET

Pediatric Indications & Dosing

- 2 - 6 LPM via nasal cannula
- 10 - 15 LPM via non-rebreather mask
- 10 - 15 LPM or greater via BVM / ET
- 10 - 25 LPM Blow by

Contraindications

- None
- May depress respirations in rare patients with chronic obstructive pulmonary disease. This is not a contraindication to its use, but simply means that such patients must be watched closely and assisted to breathe if the respiratory rate declines.

Adverse Reactions

- Toxicity
- Depressed hypercarbic drive (Respiratory depression with COPD patients)

Precautions

- N/A

Medical Considerations

- None

Mechanism of Actions

- Medical gas

Rocuronium (Zemuron™)

Paramedic

Special Notes:

Onset: Less than 2 minutes Half Life: 1 – 2 minutes

Adult Indications & Dosing

- **Adult Rapid Sequence Intubation (RSI) Procedure**
 - 100 mg IVP, IO
- **Adult Rapid Sequence Intubation (RSI) Checklist**
 - 100 mg IVP, IO

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Hypersensitivity

Adverse Reactions

- **Cardiovascular:** arrhythmia, abnormal electrocardiogram, tachycardia
- **Digestive:** nausea, vomiting
- **Respiratory:** asthma (bronchospasm, wheezing, or rhonchi), hiccup
- **Skin and Appendages:** rash, injection site edema, pruritus

Precautions

- Severe anaphylaxis has been reported. Consider cross-reactivity among neuromuscular blocking agents.

Medical Considerations

- Avoid use of long-acting neuromuscular blockers like rocuronium in neurologic emergencies if possible

Mechanism of Actions

- Neuromuscular blocking agent

Sodium Bicarbonate

Paramedic

Special Notes:

Onset: Immediate

Adult Indications & Dosing

- Pulseless Electrical Activity (PEA) Overdose/Toxic Ingestion
 - 1 mEq/kg (1 mEq/mL) IVP, IO

Pediatric Indications & Dosing

- Pediatric Pulseless Arrest Pediatric Overdose/Toxic Exposure
 - 1 mEq/kg (1 mEq/mL) IVP, IO

Contraindications

- Hypertension
- Convulsions
- CHF
- Other situations where administration of sodium can be dangerous

Adverse Reactions

- Hypernatremia
- Alkalosis
- Hypokalemia

Precautions

- Over dosage and alkalosis should be avoided, may cause vascular irritation or sloughing if given extravascularly
- Avoid scalp vein use
- Risks of over dosage and alkalosis should be avoided. Use caution in patients with CHF or other edematous or sodium-retaining states.

Medical Considerations

- Flush IV tubing before and after administration. If potassium falls too low, the heart may become irritable, especially if the patient is taking a digitalis preparation.

Mechanism of Actions

- Alkalinizing agent, Antacid, Electrolyte

Succinylcholine (Anectine®)

Paramedic

Special Notes:

Onset: 0.5 - 1 minute

Adult Indications & Dosing

- **Adult Rapid Sequence Intubation (RSI) Procedure** **Adult Rapid Sequence Intubation (RSI) Checklist**
 - 1.5 - 2 mg/kg (20 mg/mL) IVP

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Family history of malignant hyperthermia, Skeletal muscle myopathies, Hypersensitivity
- After acute phase of: Major burns, multiple trauma, major crush injury, or abdominal sepsis (over 24 hours) and denervating conditions (CVA, Parkinson's disease, ALS, spinal cord injury)
- Succinylcholine administered to such individuals may result in severe hyperkalemia which may result in cardiac arrest.

Adverse Reactions

- Profound muscle relaxation, respiratory depression & apnea-profound, causes hyperkalemia, cardiac arrest, malignant hyperthermia, arrhythmias, bradycardia, tachycardia, hypertension, hypotension, increased intraocular pressure, muscle fasciculations, jaw rigidity, excessive salivation, and rash

Precautions

- Patients with fractures or muscle spasm because of muscle fasciculations, may cause additional trauma. May cause a transient increase in intracranial pressure. May cause intragastric pressure, which could result in regurgitation and possible aspiration.
- Neuromuscular blockade may be prolonged in patients with hypokalemia or hypocalcemia.
- **Use caution in patients with:** Penetrating eye injury & closed head injuries, Glaucoma

Medical Considerations

- Causes visible fasciculations, or disorganized muscle contractions.

Mechanism of Actions

- Depolarizing skeletal muscle relaxant. Neuromuscular blocker.

Tetracaine (Pontocaine®)

Paramedic

Special Notes:

Onset: N/A

Adult Indications & Dosing

- **Eye Injury/Complaint**
 - 2 Drops Drops

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Penetrating injury to eye or extrusion of scleral contents

Adverse Reactions

- **CNS:** Dizziness, Drowsiness, sweating, muscle twitching, trembling
- **Cardiovascular:** Irregular heart rate
- **Respiratory:** Shortness of breath
- **Gastrointestinal:** Nausea & Vomiting
- **General:** Unusual excitement, Nervousness, Restlessness
- **Less common occurrences:** Burning, Stinging, Redness
- **Rare occurrences:** Itching, Pain, Swelling of eye or eyelid, watering of eyes

Precautions

- Do not rub or wipe eye until anesthetic has worn off and feeling in eye returns. To do so may cause injury or damage to the eye.

Medical Considerations

- None

Mechanism of Actions

- Ophthalmic anesthetic

Thiamine (Vitamin-B1)

Paramedic

Special Notes:

Onset: < 1 minute

Adult Indications & Dosing

- Altered Mental Status Seizure Suspected Stroke Syncope
 - 100 mg IVP

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Hypersensitivity / Allergy

Adverse Reactions

- Most frequent reaction is an extension of the drug's pharmacological action beyond the time period needed. May vary from skeletal muscle weakness to profound and prolonged skeletal muscle paralysis resulting in respiratory insufficiency or apnea.

Precautions

- Slower circulation time in cardiovascular disease, old age, edematous states resulting in increased volume of distribution may contribute to a delay in onset time. Severe obesity or neuromuscular disease may pose airway and/or ventilatory problems. Malignant hyperthermia. Vecuronium has no known effect on consciousness, the pain threshold, or cerebation. Administration must be accompanied by adequate anesthesia or sedation.
- **Storage:** Protect from light.

Medical Considerations

- Keep patient sedated with Versed when using Vecuronium. Monitor vital signs every 5 minutes. Patient must be monitored with capnography while paralyzed.

Mechanism of Actions

- Paralytic, Non-depolarizing neuromuscular blocking agent

Toradol (Ketorolac)

AEMT

Paramedic

Special Notes:

Onset: 30 minutes

Adult Indications & Dosing

- **Pain Control**
 - 30 mg IVP
 - 30 mg IVP
 - 30 mg IVP
 - 60 mg IM
 - 60 mg IM
 - 60 mg IM

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- Suspected CVA
- Any patient known to be pregnant.
- Known Renal Disease or Recent Renal Transplant
- Patient's with Drug Allergies to NSAIDs, e.g. Ibuprofen and Naproxen
- Patients with Active / Uncontrollable Bleeding
- History of Gastric Ulcers

Adverse Reactions

- Allergic Reaction to NSAID

Precautions

- Use Caution in Patients with Abdominal Pain with unknown pathology

Medical Considerations

- GI Upset to ibuprofen / naproxen is not a contraindication to Ketorolac (Toradol)

Mechanism of Actions

- Ketorolac, a nonsteroidal anti-inflammatory drug, is an option for the management of acute moderate-to-severe pain.
- In pediatric cases, ketorolac demonstrates effectiveness comparable to major opioid analgesics.

Tranexamic Acid (TXA)

AEMT

Paramedic

Special Notes:

Onset: 3 hour half-life

Adult Indications & Dosing

- Obstetrical Emergency Multiple Trauma Trauma Arrest
 - 2 gm IVP

Pediatric Indications & Dosing

- No pediatric doses for this medication.

Contraindications

- More than 3 hours since injury
- On anticoagulants
- Do not give to known pregnancy

Adverse Reactions

- HTN
- Increased ICP

Precautions

- Monitor for symptoms of severe allergic reaction and changes in vision

Medical Considerations

- Transport to Designated Trauma Center

Mechanism of Actions

- Antifibrinolytic hemostatic

Quick Drug Infusion Reference

DRUG	CONCENTRATION	TYPICAL DOSING
AMIODARONE	150 mg or 300 mg in 100 ml normal saline or D5W (remember filter)	1 mg/min
CEFTRIAXONE	1 gram in 50 or 100 ml of NS or D5W	Infuse over 30 min
DILTIAZEM	100 mg/100 ml NS = 1 mg/ml	10 – 15 mg/hour
DOBUTAMINE	1 gram/250 ml NS = 4 mg/ml	2 – 20 mcg/kg/min
DOPAMINE	400 mg/250 ml NS = 1.6 mg/ml	2 – 20 mcg/kg/min
EPINEPHRINE	4 mg/250 ml NS = 16 mcg/ml	1 - 4 mcg/min
HEPARIN	25,000 units/500 ml NS = 50 units/ml	see protocol
LIDOCAINE	2 grams/250 ml NS = 8 mg/ml	1 – 4 mg/minute
NICARDIPINE	25 mg/50 ml NS = 0.5 mg/ml 5mg/hour to	15 mg/hour
NITROGLYCERINE	50 mg/250 ml NS = 200 mcg/ml	5 – 200 mcg/min
NOREPINEPHRINE	8 mg/250 ml NS = 32 mcg/ml	0.02 - 0.5 mcg/kg/min
PHENYTOIN	1 gram in 100 ml NS (remember filter)	Not faster than 50 mg/min
PROCAINAMIDE	2 grams/250 ml NS = 8mg/ml	17 mg/kg bolus at 20 mg/min to 1 gram then 1 – 4 mg/min

Drug Formulary List

Lima Memorial Health System EMS Protocol Standard Drug Formulary List

Brand Name	Trade Name	Strength	Dose Form	Supplied
Adenocard	Adenosine	3mg/ml	Injection	Vial
Ancef	Cefazolin	1g/2g vials	Injection	Vial
Anectine	Succinylcholine	20mg/ml - 10ml	Injection	Vial
Aspirin, Children's	Aspirin, Low Dose	81 mg	Tablet	Chewable
Atropine Sulfate	Atropine Sulfate	0.1mg/ml - 10ml	Injection	Syringe
Atrovent	Ipratropium bromide	0.5mg/2.5 ml UD	Inhalation	U/D amp
Benadryl	Diphenhydramine	50mg/ml	Injection	Vial
Calcium Chloride	Calcium Chloride	100mg/ml	Injection	Syringe
Cardizem	Diltiazem HCL	5mg/ml	Injection	Vial
Ceftriaxone	Rocephin	2g	Injection	Vial
Cordarone	Amiodarone HCL	150mg/3ml	Injection	Vial
Cyklocapron	Tranexamic Acid	1000 mg/10ml	Injection	Syringe
Dextrose 10%	Dextrose 10%	250 ml	Injection	Bag
Dextrose 25% "Infant"	Dextrose 25%	2.5GM/10ml	Injection	Syringe
Dextrose 5% Water	D5W	1000ml	Injection	Bag
Dextrose 50%	Dextrose 50%	25GM/50ml	Injection	Syringe
Duo Neb	Albuterol/Atrovent	3ml	Aerosol	Vial
Epinephrine	Epinephrine	1mg/ml	Injection	30ml Vial
Epinephrine	Epinephrine	0.1mg/ml - 10ml	Injection	Syringe
Epinephrine	Epinephrine 1:1000	1mg/ml 1ml	Injection	Amp
EpiPen Auto Injector	Epinephrine	0.3mg/0.3ml	Injection	Syringe
EpiPen Jr. Auto Injector	Epinephrine	0.15mg/0.3ml	Injection	Syringe
Etomidate	Amidate	10ml	injection	Vial
Fentanyl Citrate	Fentanyl Citrate	50mcg/ml - 2ml	Injection	Amp
Glucagon	Glucagon	1mg/ml	Injection	Vial
Haloperidol	Haldol	10 mg/ml	Injection	Vial
Glucose 15	Glucose Oral Gel	15gm/dose	Oral Gel	Tube
Inapsine	Droperidol	5 mg/2 mL	Injection	
Intropin	Dopamine	40mg/ml - 10ml	Injection	Vial
Ketamine	Ketalar	500 mg/10ml	Injection	Vial
Labetalol	Trandate	20 mg/4ml	Injection	Syringe
Lactated Ringers	LR	500 or 100 ml	Injection	Bag
Levophed	Norepinephrine	4mg ampule	Injection	Amp

**Lima Memorial Health System EMS Protocol
Standard Drug Formulary List**

Lidocaine HCL	Lidocaine HCL	2% - 20ML MDV	Injection	Vial
Lidocaine HCL	Lidocaine HCL	20mg/ml - 5ml	Injection	Syringe
Lidocaine HCL	Lidocaine Pre-mix bags	2gm/D5W-500 ml	Injection	Bag
Magnesium Sulfate	Magnesium Sulfate	5gm/10ml	Injection	Syringe
Morphine Sulfate	Morphine Sulfate	10mg/ml	Injection	Tubex
Norcan	Naloxone	2mg/2ml	Injection	Syringe
Nitro-Lingual Spray	Nitroglycerin	0.4mg/spray	Spray	Bottle
Nitrostat	Nitroglycerin	0.4mg	Tablet	Sublingual
Nubain	Nalbuphine	10mg/ml	Injection	Amp
Oxygen	Oxygen	100%	Inhalation	Cylinder
Proventil	Albuterol	2.5mg/3ml	Inhalation	U/D amp
Racemic Epi	S2 Inhalant	2.25%	Nebulizer	Vial
Rocuronium	Zemuron	10mg/ml	Injection	Vial
Sodium Bicarbonate	Sodium Bicarbonate	50mEq/50ml	Injection	Syringe
Sodium Chloride	Sodium Chloride	0.9% - 100 to 1000 ml	Injection	Bag
Sodium Chloride	Sodium Chloride	0.9% - 1000ml	Irrigation	Bottle
Solu-Medrol	methylprednisolone	125mg/ml - 2ml	Injection	Vial
Tetracaine HCL	Tetracaine HCL	10mg/ml - 2ml	Injection	Solution
Thiamine	Thiamine (Vit. B-1)	100mg/ml	Injection	Vial
Toradol	Ketorolac	30 mg/mL, 15 mg/mL, 60 mg/mL	Injection	
Versed	Midazolam	5mg/ml	Injection	Vial
Water, Sterile	Water, Sterile	1000 ml	Irrigation	Bottle
Zofran	Ondansetron HCL	4mg/2ml	Injection	Vial
Zofran ODT Tablet	Ondansetron ODT	4mg	Tablet	Tablet

Approved:

Dr. Todd Brookens, D.O.

Signature: _____

Date: 2/10/2026

Notarized by: Doug LaRue

Doug LaRue 2/10/2026



DOUG LARUE

Notary Public, State of Ohio
My Commission Expires

3-11-2029

RESPONSORT

January 2026

Interfacility Transport Protocols

Interfacility Amiodarone (Cordarone)

Paramedic

Clinical Indications

- Control of ventricular arrhythmias
- When ordered by a physician with written orders to continue medicated drip during transport

Contraindications

- Allergy or hypersensitivity to medications.
- Hypotension
- Second Degree Heart Block
- Third Degree Heart Block

Procedure

1. Follow Universal Care and Wide Complex/V-Tach protocol, when applicable
2. Obtain written orders from transferring physician and include with the patient care documentation
3. Verify concentration, dosage and VS parameters on physician's order sheet from transferring hospital
4. Monitor vital signs: B/P, heart rate every 15 minutes continuous EKG monitoring.
5. Notify Medical Control of the vital signs (heart rate < 110 / > 150, or Systolic BP <90) deviate from the predetermined parameters set forth by the transferring hospital or any AV Block.

Certification Requirements

Attend equipment in-services · Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Antibiotics

Paramedic

Clinical Indications

- Treatment of bacterial infections.
- The list of potential antibiotics that can be transported is extensive. This list contains some examples only. Paramedics may transport all antibiotics/antivirals whether listed or not. - Ciprofloxacin, Cefazolin, Cefotaxime - Gentamycin, Vancomycin, Levaquin - Amoxicillin, Ampicillin, Penicillin - Doxycycline, Tetracycline - Acyclovir

Contraindications

- Allergy or hypersensitivity to medications.

Procedure

1. Paramedics may maintain antibiotic transfusions during inter-hospital transfers that are initiated by the referring facility. These may be peripheral IV lines or PICC lines.
2. Antibiotics/antivirals must be delivered as a piggy-back or secondary line. They should always be run with a compatible main IV line/PICC line such as Normal Saline or other compatible crystalloid IV solution.
3. Some people may have an allergic reaction to antibiotics, particularly Penicillin and similar medicines such as Cephazolin. They can develop side-effects such as a rash, swelling of the face and tongue, and difficulty breathing. This is called an anaphylactic reaction and it can be serious or even fatal.
4. During transport, if the patient develops signs or symptoms of an anaphylactoid reaction, turn off the antibiotic and remove bag from main IV line.
5. Establish a second IV line. Do not push any medications through any IV line that may contain residual Antibiotic.
6. Refer to *Anaphylaxis Protocol* and contact On-Line Medical Control for further orders.
7. No other medications may be administered through an antibiotic/antiviral infusion.
8. The Paramedic may transport a patient with an antibiotic/antiviral infusion running through a PICC line.

Certification Requirements

Attend equipment in-services • Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Cardizem (Diltiazem)

Paramedic

Clinical Indications

- Control of Atrial Fibrillation or Atrial Flutter with Rapid Ventricular Response
- When ordered by a physician with written orders to continue medicated drip during transport

Contraindications

- Allergy or hypersensitivity to medications.
- Hypotension
- Second Degree Heart Block
- Third Degree Heart Block
- Ventricular Tachycardia

Procedure

1. Follow Universal Care and Atrial Fibrillation protocol, when applicable
2. Obtain written orders from transferring physician and include with the patient care documentation
3. Verify concentration, dosage and VS parameters on physician's order sheet from transferring hospital
4. Monitor vital signs: B/P, heart rate every 15 minutes continuous EKG monitoring.
5. Notify Medical Control of the vital signs (heart rate < 110 / > 150, or Systolic BP <90) deviate from the predetermined parameters set forth by the transferring hospital or any AV Block.

Certification Requirements

Attend equipment in-services · Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Heparin

Paramedic

Clinical Indications

- Treatment of acute coronary syndrome/unstable angina/MI
- Treatment of DVT
- Treatment of PE
- Treatment of acute arterial occlusion

Contraindications

- Allergy or hypersensitivity to medications
- Active hemorrhage
- Gastrointestinal hemorrhage
- Intracranial hemorrhage

Procedure

1. Heparin infusions started at referring facilities may be maintained by ALS personnel at the rate initiated by the referring facility. Typical treatment regimens include 5000 unit bolus followed by an infusion at 1000 units/hour. Alternate treatment regimens include a weight-based dosing determined by the referring facility.
2. Heparin infusions should be maintained at the unit/hour rate determined by the referring facility.
3. Heparin infusions should be discontinued if the patient develops signs of active bleeding or has signs of allergic reaction (rare). On-Line Medical Control should be contacted immediately for further instructions.
4. The Paramedic may maintain an infusion begun through a PICC line.

Certification Requirements

- Attend equipment in-services
- Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure.
- Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Nitroglycerin

Interfacility Nitroglycerin - Medical Reference

Paramedic

Clinical Indications

- Treatment of chest pain related to acute coronary syndrome/unstable angina/MI.
- Blood pressure control.

Contraindications

- Allergy or hypersensitivity to medications.
- Hypotension

Procedure

1. Paramedic's may maintain infusions of nitroglycerine during inter-hospital transfers if the medication is initiated at the referring facility.
2. If the patient condition changes, contact On-Line Medical Control for orders.
3. If the patient develops hypotension (SBP<100), turn drip off and contact On-Line Medical Control for orders.
4. The EMT-P may maintain an infusion begun through a PICC line.

Certification Requirements

- Attend equipment in-services
- Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure.
- Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Potassium/Sodium Bicarbonate

Paramedic

The Paramedic may maintain the following infusions started at referring facilities:

- IV Solutions containing Potassium such as D51/2NS with 20 Meq KCL
- Sodium Bicarbonate drips (strongly consider recommending Mobile ICU for these patients)

The Paramedic MAY transport KCL infusions that are NOT greater than 10 mEq/hour.

- ALL patients being transported with these infusions must be monitored with NIBP, SPO2, Cardiac monitoring.
- Any change in patient condition during transport mandates a call to medical control for further direction.

Interfacility Protonix (Pantoprazole)

Paramedic

Class

Proton pump Inhibitor

Action

Decreases secretion of gastric acid and chronic reflux

Indication

Patients with upper GI Bleed

Contraindication/Adverse Reactions

- Jaundice
- GI upset
- CNS Symptoms

Precautions

Hypersensitivity to Proton Pump Inhibitor drug class

Side Effects

- Anaphylaxis
- Rash

Equipment

Infusion Pump

How Supplied

40 mg/50 mL
80 mg/100 mL

Dose

Bolus of 80 mg over 5 minutes given to infusion
IV Infusion of 8 mg/hour

Standing Orders

- Routine ALS Care
- Verify infusion rate as well as total time at the transferring facility prior to departure
- Monitor patient closely enroute

Interfacility Vasopressor Infusions

Paramedic

Clinical Indications

- Treatment of hypotension.
- Improve renal perfusion/urine output.

Contraindications

- Allergy or hypersensitivity to medications.
- Hypertension

Procedure

Paramedics may maintain Vasopressor infusions during inter-hospital transfers that are initiated by the referring facility. Strongly consider Mobile ICU/HEMS transport for unstable patients on multiple infusions etc.

During transport, if the patient develops hypotension (SBP <100mmHg), contact On-Line Medical Control for further orders.

If the patient develops hypertension, (SBP >180 mmHg), stop the infusion and contact On-Line Medical Control.

If the patient develops tachycardia (>120 bpm), contact On-Line Medical Control.

No other medications may be administered through a Vasopressor infusion. The Vasopressor may be infused through a PICC line.

Certification Requirements

- Attend equipment in-services
- Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure.
- Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Change Log

Paramedic

Version 1.7

March 2018

- Added Dopamine to post arrest hypotension protocol and sepsis/hypotension protocol.
- Per ACLS guidelines, Norepinephrine is 1st line, Epi is second line and Dopamine 3rd line.
- Added Labetalol for paramedics for hypertensive emergencies with end organ damage.
- Added Ketamine for agitated delirium; ONLY to be used for patient exhibiting violent threat to provider. Must have full monitoring, oxygen, IV established once sedated.
- Added Ketamine for Medication Assisted Intubation (MAI). Removed paralytic from protocol.

Version 1.5

December 2015

- Updated narkan for all providers.
- Updated RSI protocol.
- Updated CHF/CPAP protocol.
- Updated C-spine clearance protocol to include EMR's (Spinal Motion Restriction).
- Added sepsis protocol.
- Modified VT with pulse protocol.
- Added Norepinephrine for refractory hypotension (Deleted dopamine).
- Deleted Captopril from CHF protocol.
- Added Sodium bicarbonate/potassium containing solutions for Interfac. Transports.
- Added table of contents.
- Termination of Resuscitation (TOR guidelines) updated to include BLS only crew configuration.

Version 1.0

April 2013

- Initial Release.

Guidelines

Air Ambulance Resource Utilization

Indications

An air ambulance may be utilized at the discretion of the incident commander. Conditions that may warrant use of Air Ambulance resources include but are not limited to the following:

- Patient meets criteria for Trauma/Stroke/STEMI center evaluation.
- The patient is entrapped and extrication is expected to last greater than 20 minutes.
- The ground transport time is greater than 15 minutes.
- The patient is not in traumatic cardiac arrest.

A helicopter may also be utilized when any of the following is present.

- A situation approved by the medical director or medical control physician - or -
- Mass Casualty Incident (MCI).

Procedure

1. The Incident Commander determines that a helicopter is needed for the patient.
2. The Incident Commander notifies dispatch to contact the closest helicopter service for a scene transport. The dispatch center determines which air ambulance is nearest and utilize this resource.
3. A safe landing zone should be established.
4. Do not delay transport of an ill or injured patient while waiting for a helicopter resource.

COVID 19 EMS Non-Transport

COVID-19 EMS Non-Transport Guidelines

**Due to the National Emergency related to the SARS-CoV2 (COVID-19) outbreak, the following guidelines are implemented for EMS agencies under the medical direction of Dr. Todd Brookens, D.O. This guideline is to be used during times of decreased manpower and does not eliminate the need for common sense. All other protocols are in effect and first responders must maintain care within their scope of practice.*

1.) When you arrive on the scene, assess your patient as usual to determine if they have the signs and symptoms consistent with COVID-19 AND are a candidate to shelter in place or be transported by private vehicle.

Signs and symptoms of COVID-19 include, but are not limited to:

- Fever
- Cough
- Difficulty Breathing
- Exhaustion

Patients with chest pain, breathing difficulties, hypoxia, abnormal vital signs are not candidates for non-transport unless they sign a refusal of care form. On-Line Medical Control would need to be contacted in the situation as well.

2.) Please refer the patient to the:

ODH hotline at 1-833-427-5634

or the

Community Call Center at 419-226-9000

(7 days a week from 8 am to 5 pm) for further guidance

3.) After completing a medical assessment and determining that an emergency medical condition requiring transport by an EMS professional does not exist and the patient is a candidate to be transported by other means, call On-Line Medical Control for permission to have patient transported by private vehicle.

4.) A Patient Care Report must be filled out on all patient encounters.

5.) As always, use excellent customer service skills!

If in doubt, err on the side of transport of the patient.

This protocol goes into effect on March 24, 2020

Criteria for Death/Withholding Resuscitation

Indications

For a patient who is unresponsive, apneic, pulseless and in asystole

- Confirm cardiac arrest
- Check responsiveness
- assess breathing (no normal breathing/agonal breathing)
- Check for carotid pulse
- Attach cardiac monitor/defibrillator
- Confirm asystole in 2 leads

If truly pulseless and in asystole, this is cardiac arrest

When NOT to start resuscitation

There are obvious signs of irreversible death such as:

- decapitation
- Incineration
- decomposition
- hemicorpectomy (body cut in half)
 - dependent lividity with rigor mortis

There is a valid DNR

When to start resuscitation:

If none of the above are present, begin high-quality CPR even if:

- Arrest is unwitnessed
- Patient is in asystole
- The downtime is unknown

Follow appropriate BLS and ALS guidelines and Termination of Resuscitation (TOR) guidelines

Deceased Subjects

Indications

One or more of the following is present:

- Rigor mortis and/or dependent lividity.
- Decapitation.
- Incineration.
- If arrest is traumatic in origin, go to: **Trauma Arrest Protocol**.

Procedure

1. Do not resuscitate any patient who meets the above criteria. If resuscitation efforts are in progress, consider discontinuing the resuscitation efforts.
2. Notify law enforcement and/or the Coroner of the patient's death (or a patient's physician if patient is in a medical facility with continual physician or nursing care during its hours of operation; e.g. hospital, nursing home, physician's office).
3. If any questions or if you need further guidance, please contact medical control.

Note

If you are unsure whether the patient meets the above criteria, resuscitate.

Do Not Resuscitate Form

Policy

Any patient presenting to any component of ProMedica Transportation Network with a completed Ohio Do Not Resuscitate (DNR) form shall have the form honored and CPR and ALS therapy withheld in the event of cardiac arrest.

Purpose

- To honor the terminal wishes of the patient.
- To prevent the initiation of unwanted resuscitation.

Procedure

1. When confronted with a patient or situation involving DNR, the following conditions must be present in order to honor the DNR form and withhold CPR and ALS therapy:

◦ Ohio DNR form
◦ Effective date and expiration date filled out and current
◦ Form signed by a physician, physician's assistant, or nurse practitioner
◦ Patient in cardiac arrest
2. A valid DNR form may be overridden by the request of:

◦ The patient
◦ The guardian of the patient
◦ An on-scene physician
3. A living will or other legal documentation that identifies the patient's desire to withhold CPR or ALS therapy may be honored with the approval of **Medical Control**. This should be done when possible in consultation with the patient's family and personal physician.

Documentation-Patient Care Report (PCR)

Policy

For every patient contact, the following must be documented at a minimum:

1. A clear history of the present illness including chief complaint, time of onset, associated complaints, pertinent negatives, mechanism of injury, etc. This should be included in the subjective/typed portion of the PCR. The section should be thorough enough to re-create the clinical situation after it has faded from memory.
2. An appropriate physical assessment that may include pupil assessment, breath sounds, motor function, abdominal exam, chest exam, head exam, extremity exam, etc. When appropriate, this information should be included in the procedures section of the PCR.
3. At least two complete sets of vital signs (pulse, respiration, and one auscultated blood pressure). These vital signs should be repeated and documented after every drug administration, prior to patient transfer, and as needed during transport of an ALS Patient. Children age < 6 do not need a BP documented.
4. Non-standard medical abbreviations should be avoided.
5. For drug administrations, you must document dosage of the drug, route of administration, time of administration, and response to drug.
6. A complete listing of treatments performed in chronological order. Any response to these treatments should also be listed.
7. For patients with an extremity injury, neurovascular status must be noted before and after immobilization.
8. For patients with spinal immobilization, document motor function before and after spinal immobilization.
9. For IV administration, the size of the IV catheter, placement of IV, number of attempts, type of fluid, and flow rate.
10. A lead II strip should be attached for all patients placed on the cardiac monitor. Any significant rhythm changes should be documented. For cardiac arrests, the initial strip, ending strip, pre and post defibrillation, pacing attempts, etc. should be attached.
11. 12 lead EKGs, when performed, should also be included in the report and transmitted to the receiving facility.
12. For patients that receive intubation, please note the centimeter mark at teeth, methods to confirm placement, size of ET tube, and number of attempts.
13. Any requested orders, whether approved or denied, should be documented clearly.
14. Any waste of narcotics should include the quantity wasted, and name of the person who witnessed the waste. Hospital personnel should be utilized (if available).
15. All crew members should review the content of the PCR for accuracy.
16. Once the call is completed, patient care information may not be modified for any reason. Corrections or additions should be in the form of an addendum.
17. For all patients who receive EMS medications or procedures (beyond KVO IV), the PCR shall be completed prior to leaving the hospital. Exceptions must be approved by the receiving facility. When possible, all PCRs should be completed prior to leaving the hospital. All PCRs should be available to the receiving facility within 4 hours.

Documentation-Vital Signs

Policy

Vital Signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives some assessment component.

Purpose

- To ensure:
- Evaluation of every patient's volume and cardiovascular status
- Documentation of a complete set of vital signs

Procedure

1. An initial complete set of vital signs includes:

- Pulse rate
- Systolic AND diastolic blood pressure
- Respiratory rate
- Pain/severity (when appropriate to patient complaint)

2. When no ALS treatment is provided, palpated blood pressures are acceptable for repeat vital signs.

3. Based on patient condition and complaint, vital signs may also include:

- Pulse Oximetry
- Temperature
- EtCO₂
- Carbon Monoxide (CO) level if available

4. If the patient refuses this evaluation, the patient's mental status and the reason for refusal of evaluation must be documented. A patient disposition form must also be completed.

5. Document situations that preclude the evaluation of a complete set of vital signs.

6. Record the time vital signs were obtained.

7. Any abnormal vital sign should be repeated and monitored closely.

Non Transport by ALS

Indications

A single Paramedic crew or a non-Paramedic/Advanced EMT staffed ambulance, when applicable.

Policy

Generally, the highest care provider should attend the patient in the patient care area. A lower level provider may attend the patient if and only if the higher level provider documents patient stability and is responsible to supervise.

The provider with the highest level of certification on scene shall conduct a detailed physical assessment and subjective interview with the patient to determine their chief complaint and level of distress. If the ALS provider determines that the patient is stable and all patient care needs can be managed by the lower level provider, patient care can be transferred to a provider of lower certification for transport to a hospital.

All personnel are encouraged to participate in patient care while on-scene; regardless of who "attends" with the patient while enroute to the hospital. The determination of who attends should be based upon the patient's immediate treatment needs and any reasonably anticipated treatment needs while enroute to the hospital. The transporting provider must write a narrative documentation that covers all aspects of assessment, care, and disposition. This should be done on one PCR.

The following patients cannot be transferred to a lower level of certification, have the Paramedic unit cancelled, or be transported by a non-Paramedic ambulance without requesting ALS intercept:

- Postictal seizure patients due to the possibility of a re-occurrence of a seizure.
- Patients who have been medicated on the scene may only be transferred to a technician of lower certification whose formulary includes the medications that were administered.
- Any patient suffering from chest pain of suspected cardiac origin, respiratory distress, hypertensive emergencies, multiple trauma, or imminent childbirth.
- Any patient in which transport would be delayed by waiting for a unit with lesser certification to arrive.

Non-Transport of Patients

EMR

EMT

AEMT

Paramedic

- Competent patients maintain the right to refuse care and/or transport. If unsure, contact On-Line Medical Control.
- All patients refusing service will be:
 - Informed of the availability of service and offered treatment and transport in a nonconfrontational, polite manner,
 - Advised to call 911 for emergency service if desired, and
 - Advised that they accept full responsibility for their actions.
- Contact Medical Control if ALS has been started and patient declines transport. Give the Medical Control Physician an explanation by recorded device of the situation and request permission to discontinue ALS. The name of the physician who gave the order must be documented in the PCR.
- The only exception to contacting Medical Control is after treating hypoglycemia and the patient meets the criteria for declining transport.
- Documentation:
 - In the report narrative, describe the patient encounter, vital signs, advice given, that the patient is alert and orientated to person, place, and time, and that the patient understands instructions given to him/her.
 - If possible, have the patient sign the AMA form, have a third party witness the signature, and give a copy to the patient.
 - Complete the "Patient Refusal of Care" procedure in the electronic call report.
- At no time will EMS professionals mention cost of transport, patient's insurance status, hospital billing or insurance practices, status of system/unit availability, or any other non-clinical subject in an attempt to influence a patient's decision to accept or decline transport.

Patient Self Medication

EMR

EMT

AEMT

Paramedic

Indications

- A patient who wishes to take his/her own medication or prescription.

Procedure

- Patient assisted Auto-Injector Epinephrine ==> EMR and above
- Patient assisted Nitroglycerin ==> EMT and above
- Patient assisted aerosolized/nebulized medications ==> EMT and above

Patients Who Present Without a Protocol

Policy

- The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the State of Ohio.

Indications

- An Ohio licensed physician at the scene who wishes to assume medical responsibility for the patient.

Procedure

- If a pre-existing "physician-patient" relationship does not exist, contact On-Line Medical Control for physician authorization; the Medical Control physician will decide if the on-scene physician will be allowed to take control of patient care and issue medical orders.
- If a pre-existing "physician-patient" relationship does exist, the physician is authorized to take control of patient care and issue medical orders.
- Follow the orders of the authorized physician even if they conflict with the existing local protocols provided they encompass skills and medications approved by both the Lima Memorial Health Systems Medical Director and the State Medical Board.

Physician on Scene

Policy

- The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the State of Ohio.

Indications

- An Ohio licensed physician at the scene who wishes to assume medical responsibility for the patient.

Procedure

- If a pre-existing "physician-patient" relationship does not exist, contact On-Line Medical Control for physician authorization; the Medical Control physician will decide if the on-scene physician will be allowed to take control of patient care and issue medical orders.
- If a pre-existing "physician-patient" relationship does exist, the physician is authorized to take control of patient care and issue medical orders.
- Follow the orders of the authorized physician even if they conflict with the existing local protocols provided they encompass skills and medications approved by both the Lima Memorial Health Systems Medical Director and the State Medical Board.

Practitioner Disciplinary Procedure

In the Lima Memorial Health Systems EMS System, a practitioner's right to practice medicine is based on extension of the Medical Director's license to practice medicine. If, in the opinion of the Medical Director, an action (or failure to act) on the part of a practitioner is of such a nature that the action or failure to act is inconsistent with, or a violation of, these procedures, or the BLS/ALS practice standard generally accepted in the medical community, the actions described below shall occur.

1. The practitioner will be notified in writing of the issues/concerns that merit the attention of the Medical Director. Notwithstanding this written notice provision, the provisions of 2 and 3 below, and based on the severity and nature of the act (or failure to act), the Medical Director may suspend a practitioner's right to practice BLS/ALS skills upon receipt of information sufficient in the judgment of the Medical Director or EMS Manager to support immediate suspension in the interest of patient safety.
2. A written explanation by the individual explaining the incident shall be presented to the Medical Director and EMS Manager within three (3) working days of receipt of the Medical Director's issues/concerns. If no written explanation of the incident is sent to the Medical Director by that deadline, the Medical Director may base his decision upon such information that is available to him as of that deadline.
3. The Medical Director or the individual may request a second meeting to further discuss the issues/concerns. If this option is exercised, the meeting shall occur within five (5) working days of receipt of the request.
4. After reviewing all materials, the Medical Director will issue a disposition of the matter. The Medical Director may exercise one or more of the following options:
 - No action taken/matter resolved
 - Remediation training
 - Warning
 - Require to precept at the approved level again
 - Temporary suspension of all BLS/ALS practice privileges or suspension of specific BLS/ALS practice privileges
 - Revocation of BLS/ALS practice privileges
5. After the individual is notified in writing of the Medical Director's decision, he/she may appeal to the Medical Director. This appeal request must be presented within five (5) working days of the decision of the Medical Director to the Medical Director or the EMS Manager for referral to the EMS Liaison Team.
6. The EMS Liaison Team will meet within ten (10) working days of receipt of the appeal request. It shall consist of the following representatives:
 - The EC Medical Director
 - The EMS Medical Director
 - The EMS Manager
 - The EC Director
 - The Trauma Program Manager
 - The EC Clinical Manager
7. The EC Medical Director will function as the presiding officer for purposes of hearing an appeal. The EMS Liaison Committee may hear witnesses (the participation of which is the responsibility of the party calling the witness) and consider documentary and other evidence. The

decision of the EMS Liaison Committee shall be in the form of written findings of fact and imposition of action(s) consistent with those findings of fact.

8. The decision of the EMS Liaison Committee is final. The written finding of facts and actions decision will be presented to the appellant ALS practitioner within five (5) working days of the conclusion of the EMS Liaison Team hearing.
9. Until the Patient Safety Subcommittee of the Peer Review CommitteeEMS Liaison Team meets in hearing, the Medical Director's action(s) as described in 4, above, will stand.
10. If a permanent revocation of ALS privileges is approved, the State Office of EMS will be notified of the decision.

The authority conferred herein does **not** apply to conduct or behavior outside the sphere of BLS/ALS practice that relies upon the Medical Director's extension of right-to-practice. It does **not** authorize actions other than warnings, warnings with limitation on certain practices, temporary suspension of BLS/ALS practice rights or revocation of BLS/ALS practice rights. Actions taken pursuant to this Procedure shall be reported to the BLS/ALS practitioner's employer, who may undertake disciplinary actions independent of the actions referred to herein.

Safe Transport of Pediatric Patients

Without special considerations, children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection to pediatric persons during EMS transport.

- To provide:
 - A safe method of transporting pediatric persons within an ambulance.
 - Protection of the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.
- | |
|---|
| 1. Drive cautiously at safe speeds observing traffic laws. |
| 2. Tightly secure all monitoring devices and other equipment. |
| 3. Ensure EMS personnel, the patient, and any other occupants use available restraint systems. |
| 4. Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle whenever possible. |
| 5. Do not allow parents, caregivers, or other passengers to be unrestrained during transport. |
| 6. Do not have the child/infant held in the parent's, caregiver's or EMS personnel's arms or lap during transport. |
| 7. For patients with respiratory distress or other medical conditions that can be worsened by stress, make every attempt to optimize safety while comforting the child. |

Termination of Resuscitation (TOR) ALS and BLS

Discontinuation of cardiopulmonary resuscitation and other advanced life saving interventions may be considered when **ALL** of the following criteria have been met:

1. Adequate CPR has been administered for at least 25 minutes without ROSC
2. Endotracheal intubation and/or supraglottic airway (SGA) placement has been successfully accomplished with adequate ventilation (as per Airway protocol)
3. IV/IO access has been achieved (Unless BLS ONLY crew on scene, No ALS available)
4. Rhythm-appropriate medications and defibrillations for shockable rhythms have been administered according to protocol; BLS = No shock advised by AED 3 times during 20 minutes of high quality CPR
5. Persistent asystole or agonal rhythm is present and no reversible causes are identified; BLS = No Shock advised 3 times during high quality CPR with BLS only crew.
6. Failure to establish spontaneous circulation = ROSC as described above.
7. Patient must be at least 18 years of age.
8. Body temperature is at least 35 centigrade (95°F) for a patient who is submerged in cold water (water temperature less than 47°F (8.5 centigrade)
9. Medical control contacted for permission to terminate resuscitation
 - Family members and others present must be acknowledged and assisted.
 - Disposition of the body as per the Deceased Persons Protocol.

TRAUMA ACTIVATION CRITERIA

LEVEL 1 TRAUMA	LEVEL 2 TRAUMA
• GCS <9 with MOI • SBP <90, age 6 years-Adult; <70, age 0 to 5 years • HR >130 • RR <10 or >29 • Facial trauma with impending airway compromise • Intubated injured patient • Flail chest or open pneumothorax • Penetrating injury to head, neck, torso, or extremities proximal to elbow / knee • Uncontrolled bleeding proximal to wrist / ankle • Inhalation injury with or without burns • Trauma with $\geq 20\%$ BSA burns • Suspect 2 or more proximal long bone fractures to elbow / knee • Amputation proximal to wrist / ankle • Pulseless extremity • Suspected pelvic fracture • Paralysis • Blood transfusing to maintain VS • ED provider discretion	• Open fractures proximal to elbow / knee • Crush injury proximal to wrist / ankle • Pedestrian / bicycle struck by vehicle >5 mph impact, thrown, or run over • Motorcycle, ATV crash >20 mph • MVC with rollover • Ejected from vehicle • MVC with high-speed collision (>40 mph unrestrained; >60 mph restrained), rollover or major auto deformity (>20 inches) • Falls >12 feet (adult) or >3x child's height • Trauma with >5% to 20% BSA burns • Death in passenger compartment • Prolonged extrication (>20 mins) • Hanging / traumatic asphyxiation • ED provider discretion
	GERIATRIC CONSIDERATIONS (AGE ≥ 65 years) • SBP ≤ 100 • HR ≥ 120 • Fall with evidence of TBI / head injury • Struck by vehicle (any speed) • Anti-coagulated with suspected injury • GCS 9-14 with MOI, change in neuro status

Procedures

Certification Requirements

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the LMHS EMS System.

12 Lead ECG

EMT - Setup &
Transmit

AEMT

Paramedic

Clinical Indications:

- Suspected cardiac patient (Chest pain, dyspnea, weakness, fatigue)
- Electrical injuries
- Syncope
- CHF

Steps

☐ 1. Assess patient and monitor cardiac status

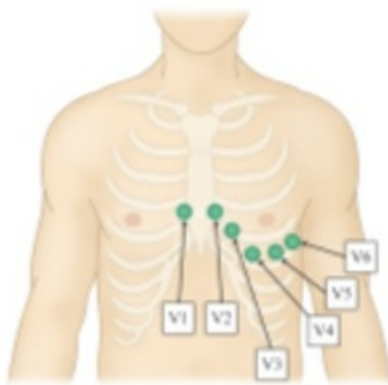
☐ 2. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG

☐ 3. Prepare ECG monitor and connect patient cable with electrodes.

☐ 4. Expose chest and prep as necessary. Modesty of the patient should be respected.

☐ 5. Apply chest leads and extremity leads using the following landmarks:

- RA - Right arm or as directed by manufacturer
- LA - Left arm or as directed by manufacturer
- RL - Right leg
- LL - Left leg
- V1 - 4th intercostal space at right sternal border
- V2 - 4th intercostal space at left sternal border
- V3 - Directly between V2 and V4
- V4 - 5th intercostal space at mid-clavicular line
- V5 - Level with V4 at left anterior axillary line
- V6 - Level with V5 at left mid-axillary line



☐ 6. Instruct patient to remain still.

☐ 7. Press the appropriate button to acquire the 12 Lead ECG.

☐ 8. Print data as per guidelines and attach a copy of the 12 lead to the PCR. Place the name and age of the patient on the paper copy of the ECG.

☐ 9. If STEMI suspected, if able, transmit 12-Lead ECG and notify hospital of STEMI alert.

☐ 10. Document the procedure, time, and results on/with the patient care report (PCR)

☐ 11. An EMT may obtain and transmit a 12 Lead ECG; a Paramedic, however, should interpret it before implementing any treatment modalities.

Airway-Orotracheal Intubation

AEMT

Paramedic

Clinical Indications:

- Patients with unprotected airway/hypoxia/critical condition/Sepsis
- Multiple trauma patient
- Respiratory arrest/ Cardiac arrest

Contraindications:

- Presence of gag reflex.
- Relative contraindications: Blood clotting abnormalities, Upper neck hematomas or infections

Steps

☐ 1. Prepare, position and oxygenate the patient with 100% oxygen

☐ 2. Select proper ET tube (and stylette, if used), have suction ready.

☐ 3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).

☐ 4. Limit each intubation attempt to 30 seconds with BVM between attempts. **AVOID HYPOXIA**

☐ 5. Visualize tube passing through vocal cords.

☐ 6. Inflate the cuff with 3 to 10 cc of air; secure the tube to the patient's face.

☐ 7. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with bag-valve mask.

☐ 8. Consider using King LTS-D / i-gel if ET intubation efforts are unsuccessful.

☐ 9. **Apply waveform capnometry and record readings on scene, enroute to the hospital, and at the hospital. Maintain EtCO₂ between 35 - 45 mmHg. Avoid overventilation**

☐ 10. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.

Airway-Suctioning-Basic

EMT

AEMT

Paramedic

Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

Steps

- ☐ 1. Ensure suction device is in proper working order with suction tip in place.
- ☐ 2. Preoxygenate the patient as is possible.
- ☐ 3. Explain the procedure to the patient if they are coherent.
- ☐ 4. Examine the oropharynx and remove any potential foreign bodies or material that may occlude the airway if dislodged by the suction device.
- ☐ 5. If applicable, remove ventilation devices from the airway.
- ☐ 6. Use the suction device to remove any secretions, blood, or other substance.
- ☐ 7. The alert patient may assist with this procedure.
- ☐ 8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient.
- ☐ 9. Record the time and result of the suctioning in the patient care report (PCR).

Airway-Suctioning - Advanced

EMT

AEMT

Paramedic

Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assessed by an airway adjunct such as a naso-tracheal tube, endotracheal tube, tracheotomy tube, or a cricothyrotomy tube.

Steps

- ☐ 1. Ensure suction device is in proper working order.
- ☐ 2. Preoxygenate the patient.
- ☐ 3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
- ☐ 4. For all devices except King, use the suprasternal notch and the end of the airway into which the catheter will be placed as guides, measure the depth desired for the catheter (judgment must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes). If using a King, suction only from the lumen of the King. Do not attempt to suction beyond the length of the King as this may promote laryngospasm.
- ☐ 5. If applicable, remove ventilation devices from the airway.
- ☐ 6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
- ☐ 7. Once desired depth (measured in number 4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
- ☐ 8. Small volume (< 10 ml) of normal saline lavage may be used as needed.
- ☐ 9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient.
- ☐ 10. Document time and result in the patient care report (PCR)

VENTILATOR MANAGEMENT

The Allen County protocol under Dr Todd Brookens will outline ventilator/BIPAP care and operation to be authorized for EMS providers who operate under the Allen County protocol system. All providers utilizing the BIPAP and ventilator must complete approved yearly competency

INDICATIONS FOR VENTILATOR USE

- Apneic patients
- Apnea in sedated patients (RSI procedure)
- Apnea in Trauma/Medical patients (advanced airway in place)
- Transfer of patients from care facility with ventilator already in place.

CONTRAINDICATIONS FOR VENTILATOR USE

- DNR-Comfort Care or DNR-Comfort Care-Arrest that outlines no resuscitative measures or respiratory/ventilation care.

MODES OF VENTILATION

(AC) Assist control- is considered a volume cycled mode of ventilation. It works by setting a fixed tidal volume (VT) that the ventilator will deliver at set intervals of time or when the patient takes a breath.

(SIMV) Synchronized intermittent mandatory ventilation- is a type of volume-controlled mode that will deliver a set number of breaths with a set volume but still allowing spontaneous breaths at patients own demand.

REQUIRED MONITORING FOR VENTILATED PATIENTS

- Cardiac monitoring.
- EtCO₂ capnography.
- Blood Pressure.
- Pulse rate.
- SpO₂

VT / FiO₂ / PEEP / PIP / BPM (Breath per Minute)

Vt - Tidal Volume:

- Based on 4 - 8 mL/kg (NIH)
- Setting of Vt (tidal volume)
 - calculated by (predicted body weight) + 2.3 x {Height in inches} - 60
See attached chart
- Pediatric Vt: 4 - 5 mL/kg

FiO₂:

- Set FiO₂ to 100% and begin to titrate down by monitoring pulse oximetry and EtCO₂ to maintain correct patient monitoring numbers.

PEEP:

- 5 cmH₂O and titrate increase as needed (should wait 20 minutes in between changes to allow recruitment of alveoli.)

PIP:

- Normal is measured at 20 cmH₂O (8 mL/kg) and reflects total resistance compliance.

BPM (Breaths per minute):

- Breaths per minute should be 10 - 20 BPM but should be titrated based on patient's acid concentration and carbon dioxide elimination.

Bi-Level / BIPAP

PARAMEDIC ONLY

Non-invasive ventilation is used to facilitate breathing. It delivers pressure to push air into the lungs. The Bi-level/BIPAP has pressure decreases for patients to be able to exhale.

Indications:

- Dyspnea and/or hypoxemia secondary to congestive heart failure.
- Acute cardiogenic pulmonary edema.
- Pneumonia.
- COPD such as asthma bronchitis, emphysema.
- Any patient who is complaining of shortness of breath other than pneumothorax.

Patient must meet the following criteria:

- Alert and oriented.
- Open airway with GCS greater than 10.
- Respiratory rate greater than 25.
- Systolic blood pressure of 90 mmHg.
- Use of accessory muscles/ increased work of breathing.

Contraindications:

- Pneumothorax.
- Agonal respirations.
- Unconscious.
- Chest trauma.
- Facial anomalies.
- Stroke.
- Respiratory Arrest.
- Facial Trauma.
- Upper GI bleed or history of gastric surgery.
- Active vomiting.

Bi-Level (BIPAP) OPERATION ON VENTILATOR

FiO₂:

- Set FiO₂ to 100% and begin to titrate down by monitoring pulse oximetry and EtCO₂, to maintain correct patient monitoring numbers such as SpO₂ and EtCO₂.
- Inspiratory positive airway pressure (IPAP): pressure delivered by the ventilator while the patient is inhaling. (9 - 18 cmH₂O)
- Expiratory positive airway pressure (EPAP): pressure delivered by the ventilator while the patient is exhaling. EPAP is equivalent to PEEP (positive end-expiratory pressure). (5 - 8 cmH₂O)
- When changing IPAP or EPAP the difference between the two MUST be greater than three.
- Starting Values of IPAP & EPAP are:
 - IPAP- 12 cmH₂O
 - EPAP - 6 cmH₂O
 - Unless patient has known history of obstructive sleep apnea, then EPAP should be set @ CPAP pressure of home unit, or higher than for airway patency.

Patients can then be titrated based on clinical needs. The difference between the two (IPAP & EPAP) control CO₂ removal. The EPAP controls oxygenation.

For low oxygen values: you would increase EPAP by 2 cmH₂O and increase IPAP by 2 cmH₂O and reassess the patient. This step may be repeated as necessary as long as you remain in target range.

For High CO₂ values (Greater than 60 or altered mental status): you would increase IPAP by 2 cmH₂O and reassess patient. This step may be repeated as long as you maintain the target range.

High CO₂ and Low oxygen: you would increase EPAP by 2cmH₂O and IPAP by 3 - 4 cmH₂O.

Blood Glucose Analysis

EMT

AEMT

Paramedic

Clinical Indications:

- Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior etc.)

Steps

- ☐ 1. Gather and prepare equipment.
- ☐ 2. Blood samples for performing glucose analysis should be obtained simultaneously with intravenous access when possible.
- ☐ 3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
- ☐ 4. Time the analysis as instructed by the manufacturer.
- ☐ 5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
- ☐ 6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
- ☐ 7. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings, and/or as recommended by the manufacturer and document in log.

CPR

EMR

EMT

AEMT

Paramedic

Clinical Indications:

- Basic life support for the patient in cardiac arrest

Steps

☐ 1. Assess the patient's responsiveness (No breathing or no normal breathing).

☐ 2. Activate Emergency Response/Get Defibrillator.

☐ 3. Start CPR --> Push Hard and Fast--> adequate rate and depth with complete chest recoil after each compression, MINIMIZE Interruptions in compressions, AVOID Excessive ventilation.

☐ 4. C-A-B (Not ABC): Compressions--Airway--Breathing.

	Location	Depth	Rate
Infants (Age less than 1 year, excluding newborns)	Over sternum between nipples (inter-mammary line), 2-3 fingers or 2 thumb technique	0.5 to 1 inch (1/3 the anteroposterior Chest dimension)	100 - 120/minute
Children (Age 1 year to puberty)	Over sternum, just cephalad from xiphoid process, heel of one hand	2 inches (1/3 the anteroposterior Chest dimension)	100 - 120/minute
Adults and Adolescents	Over sternum, just cephalad from xiphoid process, hands with interlocked fingers	2 inches	100 - 120/minute

☐ 5. Go to Cardiac Arrest procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure.

☐ 6. Provide no more than 12 breaths per minute with the BVM. Use EtCO₂ to guide your ventilations as directed in the Cardiac Arrest Procedure.

☐ 7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions are allowed for rhythm analysis, defibrillation, and performance of procedures.

☐ 8. Document the time and procedure in the Patient Care Report (PCR).

☐ 9. If an automatic CPR device is available, apply device to patient and follow manufacturer instructions for use (Adult patients only).

CPR Essentials

EMR

EMT

AEMT

Paramedic

Indications:

- Basic life support for patient in Cardiac Arrest

Procedure: ALL CERTIFICATION LEVELS: **EMR, EMT, AEMT, Paramedic**

- Assess Level of consciousness (Not breathing, Abnormal breathing)
- Bring AED to patient's side and activate
- Begin CPR with adequate rate and depth and achieving complete chest recoil between compressions.
 - Minimize interruptions
 - Avoid over-ventilation
 - Push "hard and fast"
 - Utilize automated CPR device if available per manufacturer recommendations

***C-A-B (not ABC's any more)** Focus on effective Compressions, focus on effective uninterrupted compressions. Do not interrupt compressions for airway maneuvers. An SGA (iGel or King is an acceptable alternative to intubation in cardiac arrest.

	Location	Depth	Rate
Infant	Sternum between nipples two (2) thumbs on sternum	1.5 inches	100-120/min
Child	Sternum Heel of one (1) or two (2) hands	2 inches	100-120/min
Adult	Sternum Both hands	2 inches	100-120/min

* Go to Cardiac Arrest Procedure

* 6-8 breaths/minute

* Avoid interruptions in compressions (load shock on defibrillator; dump charge if non-shockable rhythm or AED advises "NO SHOCK ADVISED")

* Document time CPR started in Patient care report (PCR)

* Always follow most current AHA Guidelines for CPR

Cricothyrotomy

Paramedic

Indications:

A patient in need of definitive airway in which you are unable to adequately ventilate due to an obstructed airway. A patient that can be adequately ventilated by other means (BVM, Nasopharyngeal/oral airway, supraglottic airway) does not require a cricothyrotomy. The only patients that qualify for a cricothyrotomy are those with an obstructed airway and inadequate ventilation.

Types of patients with obstructed airways that may need cricothyrotomy

- Direct trauma to larynx
- Anaphylactic reactions
- Food or other object in the airway (choking)

Steps

- ☐ 1. Assemble all equipment (suction, BVM, ETT, Scalpel, end-tidal CO₂ monitor, oxygen).
- ☐ 2. Extend the head if not contra-indicated (spine fracture).
- ☐ 3. Identify landmarks (Thyroid cartilage, cricothyroid membrane).
- ☐ 4. Make vertical incision over the cricothyroid membrane with #11 scalpel down to the cricothyroid membrane.
- ☐ 5. Make horizontal incision through cricothyroid membrane: Slide bougie into trachea.
- ☐ 6. Place appropriately sized endotracheal tube over bougie into trachea. The bougie is then removed and tube left in place.
- ☐ 7. Ventilate patient and measure end-tidal CO₂ with waveform capnography.
- ☐ 8. Secure tube in place. Avoid migration of tube and main-stem bronchus intubation.
- ☐ 9. Control bleeding at site of incision with gauze and direct pressure.
- ☐ 10. Contact Medical Control as soon as possible and transport to closest appropriate facility.

For departments using the Quick Trach device, this may be used in lieu of the above protocol.

Defibrillation-Automated

EMR

EMT

AEMT

Paramedic

Clinical Indications:

- Patients in cardiac arrest (pulseless, non-breathing).
- Age < 8 years, use Pediatric Pads if available.

Contraindications:

- Pediatric patients whose body habitus is such that the pads cannot be placed without touching one another.

Steps

- ☐ 1. If multiple rescuers are available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.
- ☐ 2. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions.
- ☐ 3. Remove any medication patches on the chest and wipe off any residue.
- ☐ 4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.
- ☐ 5. Activate AED for analysis of rhythm.
- ☐ 6. Stop CPR and clear the patient for rhythm analysis. Keep interruption in CPR as brief as possible.
- ☐ 7. Defibrillate if appropriate by depressing the "shock" button. **Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.** The sequence of defibrillation charges is pre-programmed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
- ☐ 8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
- ☐ 9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
- ☐ 10. If "no shock advised" appears, perform CPR for two minutes and then reanalyze.

☐ 11. Transport and continue treatment as indicated.

☐ 12. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

If pulse returns:

See :**Post Resuscitation** protocol.

Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia.

Steps

- ☐ 1. Ensure chest compressions are adequate and interrupted only when necessary.
- ☐ 2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
- ☐ 3. Apply hands free pads to the patient's chest in the proper position (Anterior-Posterior position).
- ☐ 4. Set the appropriate energy level.
- ☐ 5. Charge the defibrillator to the selected energy level. Continue chest compressions while the defibrillator is charging.
- ☐ 6. Hold compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.
- ☐ 7. Deliver the countershock by depressing the **shock button** for hands free operation.
- ☐ 8. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
- ☐ 9. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
- ☐ 10. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

IM Injection Needle Sizes

EMT

AEMT

Paramedic

Patient Age	Injection Site	Needle Size	Maximum Solution
Newborn (0 – 28 days)	Anterolateral thigh muscle	5/8" (22 - 25 gauge)	1 mL
Infant (1 – 2 months)	Anterolateral thigh muscle	1" (22 - 25 gauge)	1 mL
Toddler (1 – 2 years)	Anterolateral thigh muscle <i>Alternate Site:</i> Deltoid muscle of arm if muscle mass is adequate	1 - 1 1/4" (22 - 25 gauge) 5/8 - 1" (22 - 25 gauge)	1 mL
Children (3 – 18 years)	Deltoid muscle (upper arm) <i>Alternate Site:</i> Anterolateral thigh muscle	5/8 - 1" (22 - 25 gauge) 1 - 1 1/4" (22 - 25 gauge)	1 mL 2 mL
Adults (19 years and older)	Deltoid muscle (upper arm) <i>Alternate Site:</i> Anterolateral thigh muscle	1 - 1 1/2" (22 - 25 gauge) 1 - 1 1/2" (22 - 25 gauge)	2 mL 5 mL

Intranasal Medication Administration

EMR-IN Only

EMT-Glucagon & Narcan
only

AEMT

Paramedic

Clinical Indications:

- Patient without IV access requiring urgent medication administration (e.g., active seizure; opiate overdose).

Steps

- ☐ 1. Determine appropriate medication dose per applicable protocol.
- ☐ 2. Draw medication into syringe and carefully dispose of any sharps.
- ☐ 3. Place mucosal atomizer on the end of the syringe and screw into place.
- ☐ 4. Gently insert the atomizer into the naris. Stop once resistance is met.
- ☐ 5. Rapidly administer the medication, 1/2 of dose desired in each nares. Maximum dose 1 mL per nostril.
- ☐ 6. Document the results in the PCR.

Medications approved for use IntraNasal are:

- Fentanyl (Sublimaze)
- Glucagon (EMT Permitted)
- Ketamine (Ketalar)
- Naloxone (Narcan) (2 mg/2ml only) (EMT Permitted)
- Midazolam (Versed)
- Ondansetron (Zofran)

Minor Wound Care

EMR

EMT

AEMT

Paramedic

Clinical Indications:

- Protection and care for open wounds prior to and during transport.

Steps

- ☐ 1. Use personal protective equipment, including gloves, gown, and mask as indicated.
- ☐ 2. If active bleeding, hold direct pressure and elevate the affected area if possible. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.
- ☐ 3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
- ☐ 4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
- ☐ 5. Monitor wounds and/or dressings throughout transport for bleeding.
- ☐ 6. Document the wound and assessment and care in the Patient Care Report (PCR).

Needle Chest Decompression

AEMT

Paramedic

Clinical Indications:

- Patients with hypotension (SBP < 90), clinical signs of shock, and at least one of the following signs:
 - Jugular vein distention.
 - Tracheal deviation away from the side of the injury (often a late sign).
 - Absent or decreased breath sounds on the affected side.
 - Hyper-resonance to percussion on the affected side.
 - Increased resistance when ventilating a patient.
- ~ OR ~
- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Steps

☐ 1. Don personal protective equipment (gloves, eye protection, etc.).

☐ 2. Administer high flow oxygen.

- ☐ 3. Identify and prep the site:
- **Preferred Site** is 4th intercostal space anterior mid axillary line
Secondary site is Anterior 2nd intercostal space
on the same side as the pneumothorax.
 - Prepare the site with povidone-iodine ointment or solution.

[Note: If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.]

☐ 4. Insert the catheter (preferred 3.25 inch ARS catheter) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.

☐ 5. Advance the catheter through the parietal pleura until a "pop" is felt and the air or blood exits under pressure through the catheter, then advance catheter only to chest wall.

☐ 6. Remove the needle, leaving the plastic catheter in place.

☐ 7. Secure the catheter hub to the chest wall with dressings and tape.

☐ 8. Consider placing a finger cut from a sterile exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note - don't waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)

Non-Invasive Ventilation-CPAP

EMT

AEMT

Paramedic

Clinical Indications:

CPAP indicated for patients over age 12 with pulmonary edema, COPD, Asthma, CHF, pneumonia, submersion injury, respiratory failure who is cooperative and has spontaneous respirations. These patients may demonstrate hypoxia ($SpO_2 < 94\%$), Tachypnea, retractions, accessory muscle use, rales (crackles) in lung fields.

Contraindications:

Patient's requiring a secure airway (i.e. endotracheal intubation)

Contraindications:

- Depressed LOC (i.e. GCS < 9)
- Hypotension (SBP < 90 mmHg)
- Respiratory or Cardiac Arrest
- Major trauma/facial injury
- Uncontrolled vomiting
- Known or suspected pneumothorax
- Gastric distention (i.e. bowel obstruction)
- Patients who are unable to maintain their own airway are NOT candidates for CPAP

Steps

☐ 1. Ensure adequate oxygen supply to ventilation device.

☐ 2. Explain the procedure to the patient.

☐ 3. Consider placement of a nasopharyngeal airway.

☐ 4. Place the delivery mask over the mouth and nose. Oxygen should be flowing at this point.

☐ 5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.

☐ 6. Evaluate the response by the patient. Assess breath sounds, oxygen saturation, and general appearance of the patient.

☐ 7. Titrate oxygen to patient response. 5 cm H₂O for Asthma, COPD, Submersion injury, Pneumonia; 10 cm H₂O for CHF/ Acute Pulmonary Edema

☐ 8. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complication. The patient must be breathing on their own for optimal use of the CPAP device.

☐ 9. Document time and response on patient care report (PCR).

Spinal Motion Restriction

EMR

EMT

AEMT

Paramedic

Goals: Minimize secondary injury to spine in patients who have, or may have an unstable spinal injury

Minimize patient morbidity from immobilization procedures

Assessment: ALL LEVELS = EMR, EMT, AEMT, PARAMEDIC

1. Assess scene to determine risk of injury; mechanism alone should not determine need to immobilize. High risk mechanisms = MVC's, Axial loading injuries to spine, Falls > 10 feet
2. Assess patient in position found. Determine if C-collar needs to be applied
3. Assess mental status, neurologic deficits, spinal pain or tenderness, evidence of intoxication or other severe injuries

Treatment:

1. Immobilize with c-collar if there are any of the following:
 - Patient complains of midline neck or spine pain
 - Any midline neck or spinal tenderness with palpation
 - Any abnormal mental status, neuro deficit, extreme agitation
 - Any alcohol or drug intoxication
 - Another painful distracting injury present
 - Torticollis in children
2. Penetrating injury to neck **should not** receive spinal immobilization unless neurologic deficit is present
3. If extrication is required from vehicle, place c-collar if indicated and allow patient to self-extricate if able. Extricate infants and toddlers in car seats while strapped to car seat. Other situations requiring extrication may use a padded long board using lift and slide technique
- 4: **Patients should not routinely be transported on long boards** unless clinical situation warrants its use. If used, long boards should be padded or have a vacuum mattress applied to minimize secondary injury to the patient

Safety considerations: Be aware of potential airway compromise/aspiration/nausea and vomiting, facial and oral bleeding. Tight straps can limit chest excursion, pressure injuries to skin possible, spine board is uncomfortable

Patients likely to benefit from immobilization should undergo this treatment

Patients who are not likely to benefit from immobilization should not be immobilized

Ambulatory patients may be safely immobilized on gurney with c-collar

Long spine boards should be reserved for patient movement in non-ambulatory patients who meet immobilization criteria and should be removed as soon as is practical

Splinting

EMR

EMT

AEMT

Paramedic

Clinical Indications:

- Immobilization of an extremity for transport, either due to suspected fracture, sprain or injury.
- Immobilization on an extremity for transport to secure medically necessary devices such as intravenous catheters.

Steps

☐ 1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.

☐ 2. Remove all clothing from the extremity.

☐ 3. Select a site to secure the splint one joint proximal and distal to the area of suspected injury, or the area where the medical device will be placed.

☐ 4. Do not secure the splint directly over the injury or device.

☐ 5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlix, cloth bandage, etc.) depending on the splint manufacturer and design.

☐ 6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess.

☐ 7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:

- a. Assess neurovascular function as in #1 above.
- b. Place the ankle device over the ankle.
- c. Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis.
- d. Extend the distal end of the splint at least 6 inches beyond the foot.
- e. Attach the ankle device to the traction crank.
- f. Twist until moderate resistance is met.
- g. Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.

☐ 8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Supraglottic Airway (SGA) iGel/AirQ

EMT - (apneic only)

AEMT

Paramedic

Clinical Indications:

- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Intubation is impossible due to patient access or difficult airway anatomy.

Absolute Contraindications: Deforming facial trauma

Relative Clinical Contraindications:

- Pulmonary fibrosis
- Morbid obesity

Steps

- ☐ 1. Prepare, position and oxygenate the patient with 100% Oxygen.
- ☐ 2. Choose proper size SGA airway per package recommendations.
- ☐ 3. Check the tube for proper inflation and deflation. iGel does not require inflation.
- ☐ 4. Lubricate with a water-soluble jelly.
- ☐ 5. Insert the King airway rotated 45 degrees into posterior pharynx. Rotate into position; insert the iGel in the midline until it seats. No inflation required.
- ☐ 6. Inflate the cuffs per the manufacturer's recommendations until a seal is obtained.
- ☐ 7. Connect the SGA to a BVM and assess for breath sounds and air entry.
- ☐ 8. Apply end tidal carbon dioxide monitor and record readings at the scene, enroute to the hospital, and at the hospital.
- ☐ 9. Re-verify King placement after every move and upon arrival in the ED.
- ☐ 10. Document the procedure, time, and result on the patient care report (PCR).

	Code	Description	Size	Weight
	8205000	i-gel, large adult, supraglottic airway	5	90+kg
	8204000	i-gel, medium adult, supraglottic airway	4	50-90kg
	8203000	i-gel, small adult, supraglottic airway	3	30-60kg
	8225000	i-gel, large paediatric, supraglottic airway	2.5	25-35kg
	8202000	i-gel, small paediatric, supraglottic airway	2	10-25kg
	8215000	i-gel, infant, supraglottic airway	1.5	5-12kg
	8201000	i-gel, neonate, supraglottic airway	1	2-5kg

Synchronized Cardioversion

Paramedic

Clinical Indications:

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

Steps

- ☐ 1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
- ☐ 2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
- ☐ 3. Consider the use of pain and/or sedating medications (i.e. midazolam/fentanyl) dosing listed under appropriate protocol.
- ☐ 4. Set energy selection to the appropriate setting.
- ☐ 5. Set monitor/defibrillator to synchronized cardioversion mode.
- ☐ 6. Make certain all personnel are clear of patient.
- ☐ 7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there may be a delay between activating the cardioversion and the actual delivery of energy.
- ☐ 8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.
- ☐ 9. If the patient's condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
- ☐ 10. Repeat until maximum setting or until efforts succeed.
- ☐ 11. Note procedure, response, and time in the patient care report (PCR).

Taser Barb Removal

EMT

AEMT

Paramedic

Clinical Indications:

When TASER darts have been deployed by Law Enforcement Officers to subdue adult (17 years and older) perpetrators.

Steps

☐ 1. Once a TASER has been used against a perpetrator and the scene has been secured, a medical evaluation is necessary to ensure that the perpetrator is safe to be taken into custody.

☐ 2. The default procedure is always to transport the patient to the hospital by ambulance with a Law Enforcement Officer (LEO) in attendance.

☐ 3. Recognize that a TASER dart removal in the field should proceed only if **ALL** criteria for refusal of transport are met.

☐ 4. After a 10 minute observation period in the field (starting from arrival at the patient's side) all of the following criteria must be met:

- The patient must have a GCS of 15
- Patient must have a heart rate of > 110 bpm, a respiratory rate of > 12 bpm, Systolic BP of > 100mmHg and < 180 mmHg
- The patient has no other acute medical or psychiatric conditions requiring physician evaluation
- All TASER barbs have been accounted for
- No tetanic muscle contractions
- Patient does not request transport
- Patient is > than 17 years of age
- Patient has a current Tetanus Booster (If the patient has not had a Tetanus booster within 10 years or the status is unknown, LEO may transport to the hospital if all other criteria are met.)

- Law Enforcement are to be informed that it is the responsibility of the LEO to ensure that the patient receives a tetanus booster within 72 hours.

☐ 5. Once all of the above criteria have been met, the following steps must be followed:

- Use scissors to cut the wires.
- Wearing PPE, grasp the dart and remove with a quick, firm pull, perpendicular to the skin of the patient.
- Clean and cover each wound, as per Minor Wound Care Protocol.
- Follow Refusal of Transport Protocol.

Transcutaneous Pacing

Paramedic

Clinical Indications:

- Monitored heart rate less than 60 per minute with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
 - Chest pain
 - Hypotension
 - Pulmonary edema
 - Altered LOC, disorientation, confusion, etc.
 - Ventricular ectopy

Steps

- ☐ 1. Attach standard four-lead monitor.
- ☐ 2. Apply defibrillation/pacing pads to chest and back; preferred alternative placement is Apex and Lateral. One pad to left mid chest next to sternum, one pad to mid left posterior chest next to spine.
- ☐ 3. Rotate selector switch to pacing option.
- ☐ 4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
- ☐ 5. Note pacer spikes on EKG screen.
- ☐ 6. Slowly increase output until capture of electrical rhythm on the monitor.
- ☐ 7. If unable to capture while at maximum current output, stop pacing immediately.
- ☐ 8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
- ☐ 9. Consider the use of sedation or analgesia if patient is uncomfortable.
- ☐ 10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

Transport Medical Device

Paramedic

Indications

- Transport of an intubated or trach patient

Signs and symptoms

- Patient currently breathing with ventilation device.

Contraindications

- Insufficient training

Steps

☐ 1. Confirm the placement of tube as per airway protocol.

☐ 2. Ensure adequate oxygen delivery to the ventilator device.

☐ 3. Pre-oxygenate the patient as much as possible with BVM.

☐ 4. Remove BVM and attach ventilation device.

☐ 5. Per instructions of device, set initial respiration values; respiratory rate and volume.

☐ 6. Assess breath sounds. Allow for adequate expiratory time. Adjust ventilator setting as clinically indicated.

☐ 7. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the ventilator, remove and resume bag-valve ventilations.

☐ 8. Document time, complications, and patient response on the patient care report (PCR).

IF THERE IS EVER ANY QUESTION ABOUT WHETHER OR NOT THE DEVICES IS VENTILATING CORRECTLY, REMOVE IT AND VENTILATE MANUALLY.

PARAMEDICS MUST RECEIVE TRAINING REGARDING THEIR SPECIFIC VENT DEVICE.

KEY POINTS

Transportation ventilators may be used on successfully intubated patients according to the manufacturer's directions.

It must be noted that this is a short term adjunct, which must be monitored at all times to prevent tube displacement. If the patient begins to show any signs of further deterioration, the entire airway must be re-evaluated and a bag-valve-mask should be used until the airway can be successfully stabilized.

Venous Access-Existing Catheters

AEMT

Paramedic

Clinical Indications:

- Inability to obtain adequate peripheral access for patient requiring emergency medication administration.
- Should not be accessed for routine use.
- Access of an existing venous catheter for medication or fluid administration in emergency situations.
- Central venous access in a patient in cardiac arrest.

Steps

☐ 1. Clean the port of the catheter with alcohol wipe.

☐ 2. Using sterile technique, withdraw 5 - 10 ml of blood and place syringe in sharps box.

☐ 3. Using 5 ml of normal saline, access the port with sterile technique and gently attempt to flush the saline.

☐ 4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 5. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.

☐ 5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.

☐ 6. Record procedure, any complications, and fluids/medications administered in the Patient Care Report (PCR).

Venous Access-Extremity

AEMT

Paramedic

Clinical Indications:

Any patient where intravenous access is indicated (significant trauma or mechanism, emergent or potentially emergent medical condition).

Steps

- ☐ 1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional. (0.9% NaCl and 3 ml volume)
- ☐ 2. Paramedics can use intraosseous access where threat to life exists as provided for in the Venous Access - Intraosseous procedure.
- ☐ 3. Use the largest catheter bore necessary based upon the patient's condition and size of veins.
- ☐ 4. Fluid and setup choice is preferably:
 - Normal Saline with a macro drip (10 drop/cc) for trauma, hypovolemia, or medical conditions, and
 - Normal Saline with a micro drip (60 drop/cc) for medical infusions.
- ☐ 5. Rates are preferably:
 - **Adult:** KVO: 60 ml/hr (1 drop/6 sec for a macro drip set)
 - **Pediatric:** KVO: 30 ml/hr (1 drop/12 sec for a macro drip set)
- ☐ 6. If shock is present:
 - **Adult:** 500 ml fluid boluses repeated as long as lungs are dry and BP < 90.
 - Consider a second IV line
 - **Pediatric:** 20 ml/kg boluses repeated PRN for poor perfusion.

Vascular Access-Intraosseous

AEMT

Paramedic

Clinical Indications:

Patients where rapid, regular IV access is unavailable with any of the following:

- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure/respiratory arrest.

Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta.
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

Steps

- ☐ 1. Personal protective equipment (gloves, eye protection, etc.).

- ☐ 2.

Adult:

- 1) humeral head or distal femur
- 2) proximal tibia

Pediatric:

- 1) distal femur
- 2) proximal tibia

If available, may use yellow EZ-IO needle in the humeral head. Must have attended training session to use the humeral head site.

- ☐ 3. Prep the site with alcohol swab.

- ☐ 4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.

- ☐ 5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle. Aimed away from the nearby joint and epiphyseal plate, power the driver until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.

- ☐ 6. Remove the stylette and place in an approved sharps container.

☐ 7. Attach a syringe filled with at least 5 ml NS; aspirate bone marrow for manual devices only, to verify placement: then inject at least 5 ml NS to clear the lumen of the needle.

☐ 8. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.

☐ 9. Stabilize and secure the needle with dressings and tape.

☐ 10. You may administer, through the IO needle,

- **Adult:**

For Pain with IO

Lidocaine (Xylocaine®)

40 mg IO (2 mL) over 120 seconds.

Flush IO catheter with 5 - 10 mL NS

- **Pediatric:**

For Pain with IO

Lidocaine (Xylocaine®) (20 mg/mL)

0.5 mg/kg IO (2 mL) Over 120 seconds.

Flush IO catheter with 2 - 5 mL NS

Not to exceed 40 mg

☐ 11. Following the administration of any IO medications, flush the IO line with 10 ml of IV fluid.

☐ 12. Document the procedure, time, and result (success) on/with the Patient Care Report (PCR).

Reference

Protocol Changes

6/4/2026

Page: BiPAP/Vent

New page added.

5/1/2026

Page: Pediatric Allergic Reaction

Epinephrine 1 mg/mL (right side of page under " **Impending Arrest/Shock**"

Maximum dose changed from "0.3 mg" to "0.5 mg".

4/15/2026

Page: Pepper Spray/Taser Barb

Title changed from Police Custody to Pepper Spray/Taser Barb

The columns were separated into two headings.

Bottom left box "Use of Physical Restraint (soft)

#1. changed to state, "Pt must be supine. There must be NO pressure applied to the back. Head must be elevated 30 degrees".

Medical Reference

Differential:

First two bullet points removed

Agitated delirium secondary to psychiatric illness & Agitated delirium secondary to substance abuse.

Replaced with "Psychiatric emergency"

PEARLS

Remove reference to agitated delirium

Page: Atrial Fibrillation

Left side (top box): Added "Do not give cardizem to WPW".

Left side: Diltiazem (Cardizem): dose changed from "0.25 mg/kg" to "10 mg" added Slow IVP.

Second dosing of Diltiazem (Cardizem): Removed.

Right side: Ketamine (Ketalar): Dose changed from "0.2 mg/kg" to "25 mg" Slow IVP dilute in 10 ml NS.

Right side: Diltiazem (Cardizem): dose changed from "0.25 mg/kg" to "10 mg"

Second dosing of Diltiazem (Cardizem): Removed.

Synchronized Cardioversion added LifePak & Zoll settings

Page: Bradycardia

Atropine dose changed from "0.5 - 1 mg" to "1 mg"

Midazolam (Versed) dose changed from "2 mg" to "2 - 5 mg">

Ketamine (Ketalar) dosing changed from 0.2 mg/kg to 25 mg diluted in 10 mL NS May repeat x 1.

Epinephrine dosing changed to: Add 1 mg Epinephrine (1 mg/10 mL) to 1 Liter NS. Administer wide open until MAP >65 mmHg. Once target BP achieved, slow drip to KVO.

Page: Chest Pain

Left side off Adult IV/IO: Replaced with Inferior MI suspect right ventricular involvement. Do V4R 12 lead, if positive, start fluid bolus.

Aspirin dose changed from "325 mg" to "324 mg"

Bottom left box moved to under "with inferior MI suspected RV involvement".

Removed Box under Fentanyl reference use of NTG removed.

Ondansetron (Zofran) Updated Scope of Practice for EMT & AEMT.

Page: Supraventricular Tachycardia

Left side:

Adenocard (Adenosine) dose changed from "6 mg" to "12 mg" & may repeat x 1.

Removed second box "Adenocard (Adenosine)".

Diltiazem (Cardizem): dose changed from 0.25 mg/kg to 10 mg. May repeat x 1.

Right side:

Removed consider.

Adenocard (Adenosine) dose changed from "6 mg" to "12 mg" & may repeat x 1.

Ketamine (Ketalar) changed to "25 mg mixed in 10 ml saline flush and give slow IVP".

Synchronized Cardioversion added LifePak & Zoll settings

Page: V-Fib/Pulseless V-Tach

Epinephrine (1 mg/10 mL): Repeat dose changed from every 3 - 5 minutes to every 10 minutes.

Maximum dose changed to 3 mg over 30 minutes.

Medical Reference

Remove King LTD. Added iGel or AirQ.

Page: Altered Mental Status

Right side:

Top box, added, DKA suspected (Low EtCO₂, tachypnea, tachycardia, hyperglycemia)

Middle: Below Glucose 60 - 350 mg/dL box

Both Naloxone (Narcan) boxes added "May repeat x 1".

Added "IVP" for Naloxone (Narcan) administered by AEMT & Paramedic.

Left side Thiamine, added "Consider in alcohol abuse and malnourishment".

Page: Behavioral Emergency

Left side below Verbal Techniques

Added to last sentence, or pressure applied to the back.

Right side

Middle box, added to Midazolam (Versed) May repeat x 1.

Last sentence added, Including EtCO₂ and must have IV, IO established.

Ketamine Shortage Procedure box:

Midazolam (Versed) dose changed to "10 mg" from "2 - 5 mg".

Removed "and may repeat x 1"

New bottom box added,

Alternative Approach for sedation in psychiatric emergency

Droperidol 1.25 mg IV/IM with Diphenhydramine 25 mg IV/IM and 2-5 mg midazolam IV/IM

Must have full monitoring in place including EtCO₂.

Medical Reference:

PEARLS

Added, "depending on concentration, if calculated ketamine dose is greater than 5 ml, you will need 2 separate injection sites. ALWAYS double check proper dosing with your partner"

Page: Adult Airway

Right side under obstructed Airway
Changed to one box stating, "Video Laryngoscopy preferred".

Medical Reference

Removed King LT
Removed line referencing use of C-Collar.

Page: Adult Rapid Sequence Intubation (RSI) Procedure

#5 IO added.
#6. Ducanto attached added.
#9. Rocuronium (Zemuron) dosing changed from "1.2 mg/kg" to "100 mg".
Removed reference to Hypotension dosing with Rocuronium removed.
#10. Fentanyl (Sublimaze) dose changed from "2 mcg/kg" to "100 mcg, Maximum 200 mcg"
Midazolam (Versed) dosing changed from 0.05 mg/kg to 2 - 5 mg.
Ketamine (Ketalar) added, "if pump or Dial-A-Flow available"
Rocuronium (Zemuron) dosing changed from "0.6 - 1.2 mg/kg" to "100 mg" IVP, May repeat x 1.

Page: Allergic Reaction

Middle row
Epinephrine 1 mg/1 mL
Dosing changed from 0.3 mg" to "0.5 mg" Changed to "Auto-Injector" was "IM"

Right side
Top box added, (unconscious, requiring assisted ventilations, apneic)
Epinephrine 1 mg/1 mL
Dosing changed from 0.3 mg" to "0.5 mg"

4th box
full revision to read, Anaphylactic shock: impending arrest, unresponsive
Epinephrine 1 mg/10 ml
Give 100 mcg = 1 ml every minute until MAP >65 or symptoms improve

New box added:
Epinephrine Quick Drip
Add 1 mg epinephrine 1 mg/10 ml to 1 liter NS and infuse until MAP >65 mmHg. Slow infusion to KVO once MAP goals are achieved

Page: Respiratory Distress

Left side:
DuoNeb moved above Albuterol (Proventil). Added may repeat x 1.

Bottom box:
Epinephrine dosing changed from "0.3 mg" to "0.5 mg" IM, remove SQ.

Right side
No improvement
Epinephrine 1 mg/10 mL changed to 0.5 mg = 0.5 ml mixed with 3 ml NS and nebulize

For Severe cases
Changed to Push dose Epi 1 mg/10 ml
Mix 1 ml epi with 9 ml NS
Label syringe
Give 1-2 ml (10-20 mcg) every 3-5 minutes until improvement

Medical Reference

PEARLS
Remove line about contacting OLMC before admin

Page: Pediatric Pulseless Arrest

Left side of page,

Defibrillation boxes, added add in max of 10J/kg for children >10 kg, use adult pads, bottom of each box.

Amiodarone (Cordarone) Replaced "Consider" with "Give".

Added "OR " between Amiodarone (Cordarone) & Lidocaine (Xylocaine) boxes

Lidocaine (Xylocaine) Replaced "Consider" with "Give".

Page: Pediatric Altered Mental Status

Left side, Dextrose 10% box color changed fro "green" to "yellow".

Page: Pediatric Airway

Middle:

Under 1st Unsuccessful? box

Removed Attempt Airway-Orotracheal Intubation and replaced with, Place SGA (iGel or AirQ) immediately with waveform capnography.

Colors changed also for Scope of Practice.

Below boxes re-formatted.

Right side, box under Obstructed Airway now states, ""Video laryngoscopy preferred".

Page: Pediatric Respiratory Distress

Left side:

Epinephrine 1 mg/mL changed Maximum dose from "0.3 mg (0.3 mL)" to "0.5 mg 0.5 mL)" & color changed to green.

Middle: (under No response box,

DouNeb moved from bottom of box to top of box. Removed Ipratropium (Atrovent).

Continuous Albuterol (Proventil) added,

"Mix with 5 mL NS".

Bottom box, color changed to yellow box.

Right side: Normal Saline box color changed to blue box.

Page: Pediatric Head Trauma

Left side:

Under GCS 8

Changed to place SGA, removed "intubate". Changed to blue box.

Maintain EtCO2 changed from "35 mmHg" to "35 - 45 mmHg"

Removed next box below.

The paramedic may intubate non-apneic patients

Middle

Box below Maintain Pulse Ox > 90% color changed to Yellow.

Page: Criteria for Death/Withholding Resuscitation

Full page revision.

Page: CPR

Removed line #10:

30 degree head up positioning for CPR.

Revised columns adding or Thumbs for infants location and depth for children & Adults & Adolescents.

Page: Intranasal Medication Administration

Scope of Practice: Added in orange box for EMR IN Naloxone (Narcan)

#5. Changed to Maximum dose of 1 mL per nostril.

2/19/2026

Page: Global Changes and/or Individual Page Removals

Pediatric RSI Procedure: Page removed.

COVID 19 EMS Non-Transport: Page removed.

Page: Patient Safety

Medical Reference

Removed 2nd bullet point, "For witnessed/monitored VT, have patient cough or deliver precordial thump".

3rd Bullet Point: re-worded

4th Bullet Point: Added Calcium Chloride.

Page: Asystole

3rd box from top (middle) 1st bullet point changed to state: "first 4 minutes of arrest, high quality uninterrupted manual compressions.) Also, removed King LT Airway.

5th box from top (Middle) Repeat Epinephrine changed to every 10 minutes

Bottom (middle) box: Removed (Continue Epinephrine 1 mg/10 mL)

Bottom left box changed to state,

Contact OLMC to cease efforts. If approved, contact law enforcement and leave body with police. Leave all medical devices in place (ETT, IO, etc).

Page: Cardiac Arrest

Box under ALS

SGA/Intubate changed to: SGA (iGel or AirQ should be initial airway with waveform capnography)

&

Defibrillate changed to: With unwitnessed arrest or no bystander CPR.

Medical Reference

PEARLS:

Removed 2nd bullet point "ALWAYS FOLLOW CURRENT ACLS GUIDELINES"

3rd Bullet point: Changed to: First airway is SGA with waveform capnography.

4th Bullet point: Added, "No Termination of Resuscitation in the field for maternal arrest"

Page: Hypotension/Shock Non-Trauma

Epinephrine Drip dosing changed and added requires pump.

Page: Post Resuscitation

Top Left: Added Ketamine (Ketalar) for awareness during CPR.

Bottom left: Added new dosing for Epinephrine Drip & requires pump.

Medical Reference

MAP changed from 60 to 65 mmHg

Page: Pulseless Electrical Activity (PEA)

Top right side box: Removed ITD

Bottom right side: Removed Sodium Bicarbonate

Middle box 4 th from top: Epinephrine changed Repeat every 3 - 5 minutes to, every 10 minutes.

Left side: Fluid Bolus box: Added "give the following ONLY if Hypoglycemic. Removed Narcan.

Left side (Bottom): Added, if tension pneumothorax suspected.

Page: Ventricular Tachycardia/Wide Complex w/Pulse

Left side:

Added "OR" Between Amiodarone (Cordarone) & Lidocaine (Xylocaine)

Right side:

Ketamine (Ketalar): dose changed from "0.2 mg/kg" to "25 mg".

Medical Reference

Added to administer Calcium Chloride 1 gm and 50 mEq Sodium Bicarbonate.

Page: Drowning/Submersion

CPAP 5 cmH₂O changed to 5 - 15 cmH₂O.

Page: Hyperthermia

Left side:

Added new box, "Athletic field hyperthermia: If available at scene, cool patient in ice bath before transport if safe to do so."

Page: Abdominal Pain

Added below Ondansetron (Zofran)

OR,

Droperidol (Inapsine)

0.625 - 1.25 IVP With

Diphenhydramine (Benadryl)

25 mg IVP

Useful in patients who are extremely anxious with abdominal pain and vomiting and in cannabinoid hyperemesis syndrome.

Page: Vomiting/Diarrhea

Removed "Do not use in 1st term pregnancy" Under Ondansetron (Zofran)

Added

OR,

Droperidol (Inapsine)

0.625 - 1.25 IVP With

Diphenhydramine (Benadryl)

25 mg IVP

Page: Adult IV/IO

Left side:

5th box from top

Under IO (EZ-IO) for life-threatening event added,

Acceptable/Preferred IO sites:

1st preference (Humeral head or distal femur

2nd preference (Proximal tibia)

Page: Epistaxis

Bottom left side box:

Added alternatively, have patient blow clot out of nostril, Administer Tranexamic (TXA) 2 ml IN into that nostril . Immediately pinch soft part of nose or add nasal clamp

Page: Fever/Suspected Sepsis

Replaced 3rd box left side:

qSOFA calculation tool

Suspected infection PLUS 2 of the following:

-AMS with GCS <15?

-RR >22?

-SBP <100 mmHg?

2 or more positive?

Declare sepsis alert

Give 2 gram Ceftriaxone IV over 20 minutes

NS & LR dosing changed from "30 mL/kg" to "2 Liters"

Right side:

Epinephrine Drip dosing changed.

Page: Pain Control

Bottom box:

Morphine moved to bottom of box.

Ketamine (Ketalar): dose changed from "0.2 mg/kg" to "25 mg"

New box added

Suspected kidney stone?"

Symptoms: sudden unilateral flank pain radiating to the lower abdomen on same side usually with nausea/vomiting and unable to sit still"

30 mg IV

60 mg IM

Do not give in suspected pregnancy

Page: Seizure

Left side: Top box

Status Epilepticus changed to "Actively seizing on arrival"

Bottom box

Midazolam (Versed) changed to 10 mg IM for age <65

age >65, 5 mg IM

Change to May repeat x 1 with 5 mg

Continuous seizure after midazolam?

Ketamine 100 mg IV/IO

May repeat x 1

Be prepared to suction and manage airway

Keep head elevated 30 degrees

Right side:

Removed bottom box, "Status/Seizure Recurs, treated with Midazolam (Versed).

Page: Obstetrical Emergency

Left side 3ed box from top, Changed to:

Hypertension in Pregnancy

>20 weeks gestation and BP 140/90

Give labetalol 20 mg IV, may repeat x 1.

Midazolam (Versed):

Added "May repeat x 1."

Right side:

arrow off Normal Saline, new box added.

Tranexamic Acid (TXA) 2 gm added.

Page: Airway-Failed

King LT removed, replaced with AirQ.

Page: Pulmonary Edema

CPAP box, added 5 - 15 cmH2)

Bottom box:

Midazolam (Versed) IVP dosing changed from "1 - 2 mg" to "2.5 - 5 mg"

Midazolam (Versed) IN dosing changed from "2 mg" to "2.5 mg"

Ketamine dosing changed from "0.2 mg/kg" to "25 mg mixed in 10 mL NS may repeat x 1"

Page: Overdose/Toxic Ingestion

Left side:

AEMT/Paramedic

Both Naloxones (Narcan)

Added May repeat x 1

Page: Burns

Left side, Bottom.

Normal Saline & Lactated Rings doing changed from 20 mL/kg to 500 mL/hr

Avoid over hydration

Page: Extremity Trauma

Cefazolin (Ancef), new medication added.

Page: Head Trauma

Midazolam (Versed) dosing changed from "2-5 mg" to "2.5 - 5 mg"

Fentanyl dosing changed from "1 - 3 mcg/kg" to "100 - 200 mcg"

Page: Multiple Trauma

Left side

2nd from bottom box.

Added "OR commercial device"

Bottom box.

Switched landmarks.

Right Side:

Tranexamic Acid (TXA)

Dosing changed from "1 gm over 10 minutes" to "2 gm IVP".

Page: Trauma Arrest

Full page revision

Page: Pediatric Bradycardia

Left side:

3rd box from top added, HR <60 bpm? Begin chest compressions.

Atropine box:

Added, symptomatic bradycardia not in cardiac arrest?

Page: Pediatric IV/IO

Left side:

IO (EZ-IO) box

Added,

Preferred location: distal femur

Secondary location: proximal tibia

Page: Pediatric Pain Control

Left side:
Bottom box.
Morphine move to bottom of box.

Ketamine dosing changed from "0.2 mg/kg IV Infusion mixed in 50 mL NS" to "0.2 mg/kg IVP mixed in 10 mL NS over 10 minutes May repeat x 1"

Page: Pediatric Seizure

Page re-formatted & Ketamine (Ketalar) added.

Page: Pediatric Airway-Failed

Middle:
Box below Good Air Movement with BVM Ventilation?
Re-formatted and
Supraglottic Airway (SGA) box added, "With waveform capnography".

Medical Reference

First lines changed to state,

- Preferred first airway in pediatrics is a **SGA** (supraglottic airway)

Page: Pediatric Allergic Reaction

Middle:
4th box from top.
Epinephrine 1 mg/1 mL Maximum dose changed from "0.3 mg (0.3 mL)" to "0.5 mg (0.5 mL)".

Page: Pediatric Burns

Left side:
Under Pediatric IV/IO.
Re-formatted
Fentanyl first
Ketamine next
Morphine last

Box off Pain Control medications added, NS & LR.

Page: Cefazolin (Ancef)

New medication added.

Page: Ceftriaxone (Rocephin)

New medication added.

Page: Droperidol (Inapsine®)

New medication added.

Page: Toradol (Ketorolac)

New medication added.

Page: Drug Formulary List

Page Updated.

Page: Trauma Center Triage Criteria

Full page revision.

Infant & Child boxes:

Infant: Changed to "two (2) thumbs on sternum"

Child: Changed to "heel of one (1) or two (2) hands"

Capnography Basic

Considered the ventilation vital sign

Capnography gives a true accurate picture of ventilation status frequently before patient symptoms are recognized by health care providers.

Gives objective data regarding clinical course of management and treatment

- Arterial blood gas CO₂ has a normal range of 35 – 45 mmHg
- EtCO₂ will normally be within 0 – 5 mm of ABG CO₂ value
- EtCO₂ can be used to estimate ABG PaCO₂
- Elevated EtCO₂ = Hypoventilation / ROSC / increased metabolism
- Decreases EtCO₂ = Hyperventilation / decreased metabolism

Prehospital Airway

- *Intubated Patients*
 - Maintains Airway Presence during transport and patient movement
 - Quality of Ventilation
 - Early notification of problems or ROSC
 - Advantages to head trauma patients by maintaining ventilation rates in head injured patients
- *Non Intubated Patients*
 - Assesses ventilation status in patients with respiratory distress
 - Shows bronchodilator effectiveness
 - Indicates patients ventilation rate
 - Diabetics patients
- *The diagnostic element of CO₂ is in the waveform not in the numeric value!!!*

False Positives Possible?

After recent ingestions of a carbon beverages or alcohol, this can give a false positive EtCO₂ for 2 – 3 ventilated breaths. Several ventilations should wash out stomach CO₂ content.

Displacement of ETT against the lateral tracheal wall can cause flat wave

Phases of the Capnogram

Phase 1: Beginning of Exhalation



Anatomic Dead Space

Phase 2: Early Exhalation



Gas Mixing

Phase 3: Alveolar Plateau



Exhalation

End Tidal



Peak CO₂ Concentration
(Capnography Reading)

Phase 4: Descending Phase



Inspiration

Normal Capnography Waveform



See: [Capnography Information](#)

Capnography Information

Capnography Uses

Increased ICP - You can use capnography to maintain ventilation rates to obtain EtCO₂ at the low end of normal

Use in Ventilation Rates - useful in the prehospital setting to help maintain appropriate manual and mechanical ventilation

- Inadvertent Hyperventilation - Inadvertent hyperventilation is common following paramedic RSI despite EtCO₂ monitoring and target parameters.(1)

Cardiac Arrest - Reductions in EtCO₂ during CPR are associated with comparable reductions in cardiac output making EtCO₂ more reliable than radial pulses. (2)

Return of Spontaneous Circulation - The use of CO₂ is able to be used in the determination of ROSC often the first indicator. Increase occurs due to the excess CO₂ being washed out of the previously hypoperfused tissue.(3)

Use in Death Confirmation - Studies indicate that patients that have been intubated and have a CO₂ less than 10 which does not increase are clinically dead.(4)

ACLS Medication - You will see an initial increase in the EtCO₂ after administration of Sodium Bicarbonate. This will come back down after several ventilations. This demonstrates the reason ACLS suggest no NaHCO₃ unless adequate ventilation present

Paralytics - You may see a "curare cleft" Caused by the stronger thoracic muscles that are more paralyzed than the weaker diaphragm, This is an indicator that the patient is coming up from medication, Consider further sedation and/or paralyzation.

Pacemaker - Can be used to help determine when a patient has captured during pacing as you will see an increase in CO₂ prior to feeling a pulse. The increase is due to the increase in cardiac output that should accompany capture.

Trauma Patients - Decrease levels when determined to be not from other causes should lead you to suspect hypovolemia as severe shock will have low CO₂ due to poor perfusion. You will see an increase in CO₂ as perfusion status improves during resuscitation.

Nasotracheal Intubation - In NTI capnography can be used to guide the ET tube into proper position You will see an increase in CO₂ as the tube passes into the hypopharynx and decrease if you remove it from the hypopharynx and move toward the esophagus.(5)

Diabetic - In DKA patients, Kussmaul respiration helps correct acidosis. Patients with an EtCO₂ of less than 29 were found to be in acidosis 95% of the time, whereas no patients with EtCO₂ of 36 or higher were in acidosis.(6)

Seizure Patients - Capnography is a very valuable and reliable assessment tool to assure airway patency in seizure patients or those medicated with Diazepam, Midazolam, or Ativan for seizure activity.

- Can be used in actively seizing patients
- Increases in CO₂ are common in the seizure patient due to the exaggerated muscular activity
- Continued increases or very high EtCO₂ can indicate hypoventilation, commonly associated with benzodiazepine use.

Pain Management - Patients that are given sedatives or narcotics for pain are at risk for hypoventilation, Capnography can assure continued airway presence during extrication and/or transport with just a glance at the monitor.

Asthma - EtCO₂ is specifically good for assessing the severity of asthma or the presence of bronchospasm

- Bronchospasm can give the appearance of a "shark fin" on the waveform.
- Diagnosis of asthma versus panic attack

Patients experiencing bronchoconstriction will develop a shark fin appearance to the waveform. This shark fin will resolve as the patient responds to treatment. In the event the patient fails treatment the shark fin will not resolve and increases in EtCO₂ may be seen as the patient gets tired.

CPAP - You can use the cannula with CPAP as long as you can good get a good seal.

It is a good idea to place it on the patient to monitor respiratory status of your patient during CPAP use. Prevents missing apnea in CPAP patients

See: **Capnography Waveforms**

Capnography Waveforms

Pulmonary Embolus (PE) - Typical presentation of SOB, tachycardia, risk factors. EtCO₂ can present with normal waveform appearance and a lower numeric value due to respiratory rate and decrease perfusion to lungs. **If the PE is small you may see no change.** Small PE may demonstrate no change in EtCO₂ values and should not be used as a single assessment tool for assessment of a PE

Pregnant Patients - compression of the vena cava restricts blood flow back to the heart and lungs which can cause decreases in EtCO₂ due to decrease perfusion.

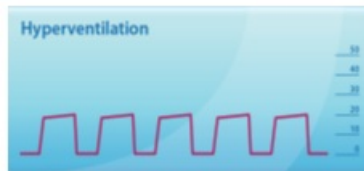
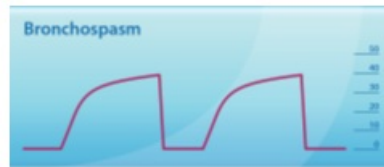
Note: Shark-fin waveform appearance in pregnant patients can be a normal finding and does not specifically indicate bronchoconstriction.

Rescue Airway Device - Rescue Airway Devices - Used to confirm adequate ventilation. without other evidence of bronchoconstriction as this may be a normal finding.

Remember

- ☐ Capnography assesses ventilation
- ☐ It confirms adequate ventilation – not a confirmed secured airway!!!!
- ☐ You have to have adequate perfusion
- ☐ Changes are immediate long before pulse oximetry
- ☐ You need to use it to be comfortable with it





References

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- (3) Singh Amar. Comparing the Ability of Colormetric and Digital Waveform End Tidal Capnography to Verify ET tube placement. Academic Emergency Medicine Vol. 10 No. 5 466-467
- (4) Levine R. End-tidal Co2 and outcome of out-of-hospital cardiac arrest. New England Journal of Medicine. July 1997;337:301-306
- (5) Phillips 2003
- (6) Fearon D., Steele D. End-tidal CO2 predicts the presence and severity of Acidosis in Children. Academic Emergency Medicine Vol 9 No. 12 1373-1378

MIAMI EMERGENCY NEUROLOGIC DEFICIT (MEND) PREHOSPITAL CHECKLIST

Date: _____		Name: _____		Age: _____	Sex: _____
BASIC DATA					
WITNESS NAME: _____			WITNESS PHONE #: _____		
Dispatch time: _____			EMS arrival time: _____	Departure to ED time: _____	
HISTORY					
LAST TIME PATIENT WITHOUT SYMPTOMS & DATE: _____ TIME: _____			ADDITIONAL HISTORY		
• T-PA EXCLUSIONS • ☐ Head trauma at onset • ☐ Seizure (shaking or staring) at onset • ☐ Taking warfarin (Coumadin) • ☐ History of bleeding problems • ☐ Possible brain hemorrhage (severe headache, stiff neck, ↓LOC)			• Symptoms _____ • Allergies _____ • Medications _____ • Past History _____ • Last Meal _____ • Events Prior _____		
MANAGEMENT					
• ☐ Do NOT treat hypertension • ☐ Do NOT allow aspiration - Keep NPO, head up, O₂, 2-4 L • ☐ Do NOT give glucose unless glucose <50 - IV NS; check fingerstick • ☐ ECG rhythm _____ • If AMI, 12 lead					
STROKE-SPECIFIC ED REPORT					
SYMPTOM ONSET		NEUROLOGIC EXAM		WITNESS	
• TIME (last time w/o sxs) _____ • Trauma (history) _____ • Seizure (staring, shaking) _____		• Level of consciousness _____ • Speech/language _____ • Visual fields _____ • Moto strength _____		• Name _____ • Contact info _____	
MEND EXAM					
On scene: Perform LOC & basic exam (Cincinnati Prehospital Stroke Scale in shaded boxes). En route: If time allows, perform the complete MEND exam.					
MENTAL STATUS					
Level of Consciousness (AVPU)		☐ On Scene		☐ En Route	
• ☐ Speech "You can't teach an old dog new tricks." ★ • Abnormal = wrong words, slurred speech, no speech		☐ On Scene		☐ En Route	
• ☐ Questions (age, month) • ☐ Commands (close eyes, open eyes)		☐ On Scene		☐ En Route	
CRANIAL NERVES					
• ☐ Facial Droop (show teeth or smile) ★ • Abnormal = one side does not move as well as other		☐ On Scene		☐ En Route	
• ☐ Visual Fields (four quadrants) ★ • ☐ Horizontal Gaze (side to side)		☐ On Scene		☐ En Route	
LIMBS					

• ☐ Motor – Arm Drift (close eyes and hold out both arms) ★ • Abnormal = arm can't move or drifts down	☐ On Scene	☐ En Route
• ☐ Leg Drift (open eyes and lift each leg separately)	☐ On Scene	☐ En Route
• ☐ Sensory – Arm and Leg (close eyes and touch, pinch)	☐ On Scene	☐ En Route
• ☐ Coordination – Arm and Leg (finger to nose, heel to shin)	☐ On Scene	☐ En Route

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RACE

RACE

Facial palsy - weakness on one side of face with smile.	Absent = 0	Mild = 1	Moderate to Severe (little to no facial movement) = 2
Arm motor function - the same test as Cincinnati and Los Angeles scales.	Normal to mild = 0	Moderate (able to lift arm, but unable to hold it for 10 seconds) = 1	Severe (unable to raise arm) = 2
Leg motor function - ask the patient to lift each leg.	Normal to mild (able to lift leg and hold for five seconds) = 0	Moderate (able to lift, but unable to hold for five seconds) = 1	Severe (unable to lift one leg off of bed at all) = 2
Head and gaze deviation - if the patient's head or eyes are towards one side, ask them to look towards the other side.	Absent = 0	Present (unable shift gaze past midline) = 1	
If a right-side deficit is found, check for aphasia (inability to say or hear words correctly). Ask the patient to close their eyes and make a fist.	Performs both tasks correctly = 0	Performs 1 task correctly = 1	Performs neither task = 2
If a left-side deficit is found, check for agnosia (an inability to process sensory information). Touch their arm and ask "whose arm is this?" Then ask them to raise both hands and clap.	Patient recognizes his/her arm = 0	Does not recognize his/her arm or the impairment = 1 Does not recognize his/her arm nor the impairment = 2	

A stroke is likely with a score above 1, and ELVO is likely if the cumulative score is above 5.

Cincinnati Stroke Scale

Cincinnati Stroke Scale

Facial Droop

- ☐ **Normal:** Both sides of face move equally
- ☐ **Abnormal:** One side of face does not move at all

Arm Drift

- ☐ **Normal:** Both arms move equally or not at all
- ☐ **Abnormal:** One arm drifts compared to the other (Close eyes and hold out both hands)

Abnormal Speech

- ☐ **Normal:** Patient uses correct words with no slurring "You can't teach an old dog new tricks"
- ☐ **Abnormal:** Slurred or inappropriate words or mute

BEFAST

B E F A S T					
BALANCE	EYES	FACE	ARM	SPEECH	TERRIBLE HEADACHE
					
Sudden loss of balance?	Loss of vision in one or both eyes?	Face looks uneven?	Arm or leg weak/ hanging down?	Speech slurred? Trouble speaking or seem confused?	Thunder clap headache? Worst headache of your life?