Denver Fire Department

Patient Care Protocols

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Denver Fire Department Protocols

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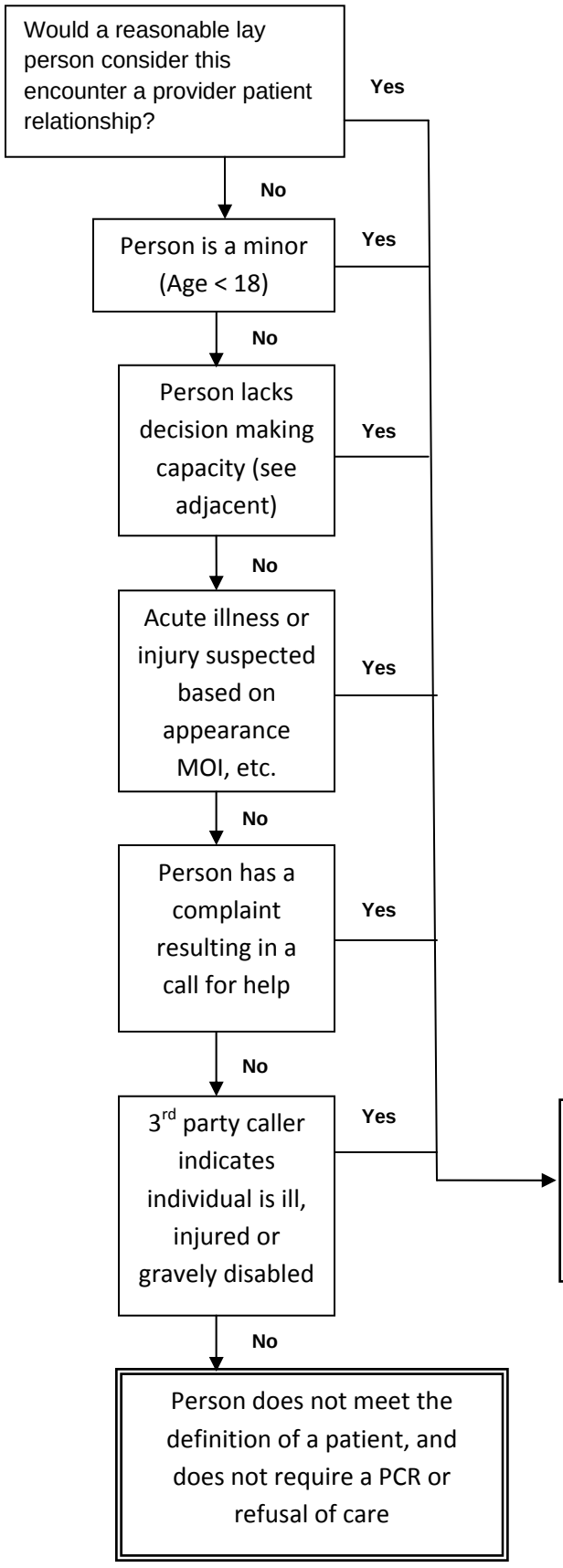
GENERAL GUIDELINES: PATIENT DETERMINATION: "*PATIENT OR NO PATIENT*"



General Guidelines

This protocol is intended to refer to individual patient contacts. In the event of a multiple party incident, such as a multi-vehicle collision, it is expected that a reasonable effort will be made to identify those parties with acute illness or injuries. Adult patients indicating that they do not wish assistance for themselves or dependent minors in such a multiple party incident do not necessarily require documentation as patients.

No protocol can anticipate every scenario and providers must use best judgment. When in doubt as to whether an individual is a "patient", err on the side of caution and perform a full assessment and documentation

Decision-Making Capacity
(Must meet all criteria)

- Understands nature of illness or injury
- Understands consequences of refusal of care
- Not intoxicated with drugs or alcohol
- No criteria for a Mental Health Hold:
  - Not homicidal or suicidal
  - Not gravely disabled or psychotic
  - Not a danger to self or others

FIELD PRONOUNCEMENT GUIDELINES

Purpose

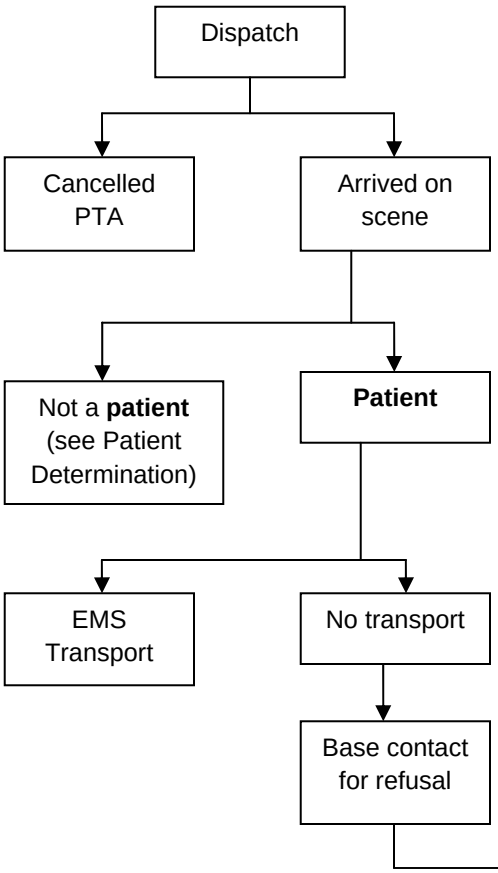
A. To provide guidelines for resuscitation and field pronouncement of patients in cardiac arrest in the prehospital setting

General Principles

A. Base contact must be made for all patients who fall within this guideline
B. Attempt resuscitation for all patients found pulseless and apneic, unless any of the following are present:
    1. Physician orders as specified on the Colorado Medical Orders for Scope of Treatment (MOST) form: “No CPR. Do Not Resuscitate/DNR/Allow Natural Death”, present with the patient
    2. A valid CPR directive present with the patient
    3. Dependent lividity or rigor mortis
    4. Decomposition
    5. Decapitation
    6. Evidence of massive blunt head, chest, or abdominal trauma
    7. Third degree burns over more than 90% of the total body surface area

After pronouncement, do not alter condition in any way or remove equipment as the patient is now a potential coroner's case.

GENERAL GUIDELINES: PATIENT NON-TRANSPORT OR REFUSAL



A person who has decision-making capacity may refuse examination, treatment and transport

A person has decision making capacity sufficient to refuse treatment and transport if he or she:

- Understands nature of illness or injury; and
- Understands the risks of refusing treatment or transport; and
- Given the risks and options, voluntarily refuses treatment or transport

Documentation Requirements for Refusal

- Confirm decision-making capacity
- EMS assistance offered and declined
- Risks of refusal explained to patient
- Patient understands risks of refusal
- Name of Base Station physician authorizing refusal of care unless standing order refusal

Base contact refusal

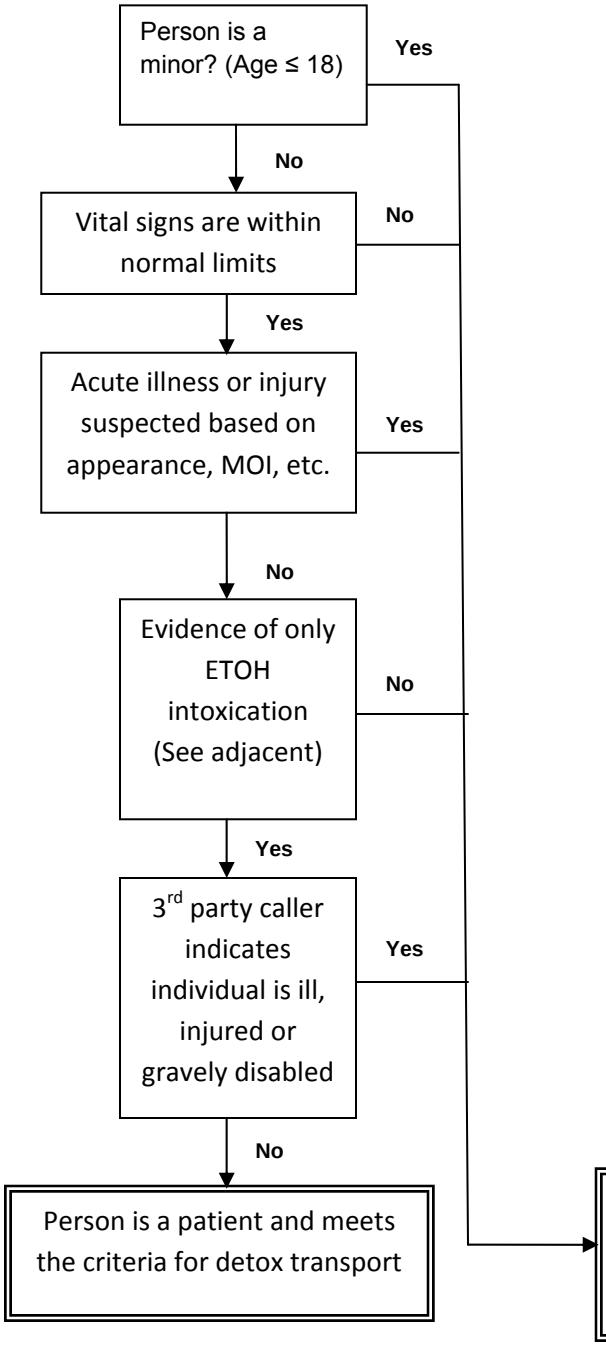
Required for

- Any patient 5 years or younger who is not being transported via ambulance regardless of the complaint
- Any patient under 18 years of age who does not have a parent/legal guardian present
- Any patient considered to be high risk

***You do **NOT** have to contact base for minor(s) 6-18 that have a parent or guardian present and are not deemed high risk.

***Any minor with **ANY** complaint or injury should be considered a patient

GENERAL GUIDELINES: CARES Detox van transport



General Guidelines

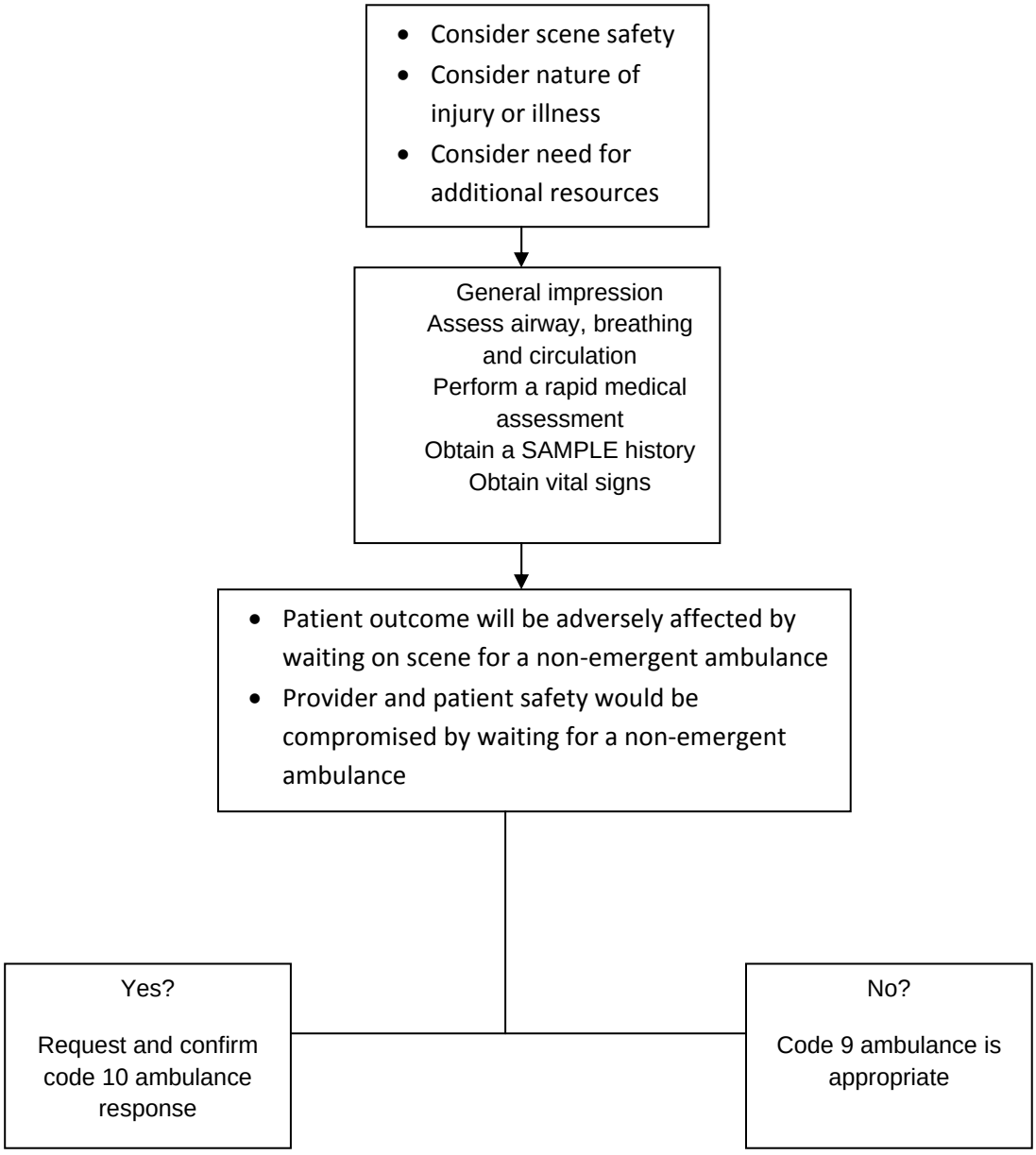
No protocol can anticipate every scenario and providers must use best judgment. When in doubt as to whether individual is a "patient", err on the side of caution continue assessment and transport for further evaluation

Evidence of ETOH intoxication

- **Odor of intoxicants**
- **Slurred speech**
- **Ataxic gait**

In the case where the party is being transported by Denver Cares, they must be able to enter the detox van with little to no assistance. The party must not require constant (home) 02 therapy, and must not require the use of a wheelchair or other powered mobility device.

CODE 10 AMBULANCE RESPONSE



DOCUMENTATION REQUIREMENTS

All patient encounters require documentation of the following

- Patient name
- Date of Birth

Description of:

- Assessment and Treatment
- Vital Signs

Description of base contact if applicable

Description of Dispostion

MASS CASUALTY INCIDENT OPERATIONS

Purpose:

To utilize a frame work for consistent management of mass casualty incidents. This protocol will be used on all incidents with multiple patients to provide for efficient and consistent management.

Definition:

An MCI is an incident which generates more patients than available resources can handle using routine procedures.

Policy:

A. Triage: Responsible for implementing START triage and routing patients to appropriate treatment area.

B. Once EMS Operations establishes section leaders for Triage, Transport and Staging assist them with patient movement , etc.

C. **Do not load patients into ambulances without specific direction from EMS**

Triage Designations

A. First priority (**Red**): Immediate

B. Second priority (**Yellow**): Delayed

C. Third priority (**Green**): Minor

D. Fourth priority (**Black**): Deceased

Glasgow Coma Score

(Minimum 3, Max 15)

Eyes:

4	Opens eye spontaneously
3	Opens eyes to voice
2	Opens eyes to pain
1	Does not open eyes

Verbal:

5	Oriented
4	Confused, disoriented
3	Inappropriate words
2	Incomprehensible sounds
1	No sounds

Motor:

6	Obeys commands
5	Localizes pain
4	Withdrawal to painful stimuli
3	Flexion to painful stimuli
2	Extension to painful stimuli
1	No movement

Airway Management: Opening the Airway

Indications

A. Inadequate air exchange in the lungs, due to jaw or facial fracture, causing narrowing of air passage
B. Lax jaw or tongue muscles causing airway narrowing in the unconscious patient
C. Noisy breathing or excessive respiratory effort that could be due to partial obstruction

Precautions

A. For trauma victims, keep neck midline and avoid flexion, extension, traction or rotation.
B. For medical patients, neck extension may be difficult in elderly persons with extensive arthritis and little neck motion. Do not use force – jaw thrust or chin lift without head tilt will be more successful.
C. All airway maneuvers should be followed by an evaluation of their success; if breathing is still labored, a different method or more time for recovery may be needed.
D. Children's airways have less supporting cartilage

Technique

A. Use BSI. To open the airway initially, chose method best suitable for patient.
B. Assess ventilation
C. Begin BVM ventilation if patient is not breathing
D. Relieve partial or complete airway obstruction if present
E. Assess oxygenation; use supplemental 02 as needed.
F. Consider positioning the patient on side (if medical problem)
G. Choose method to maintain airway patency until ALS arrives

OROPHARYNGEAL AIRWAY: Preferred adjunct if patient is obtunded

1. Choose size by measuring from mouth to ear margin.
2. Depress tongue with tongue blade, or insert gently with curving point UPWARD. Avoid snagging posterior tongue or palate.
3. Insert to back of tongue, then turn to follow curve of airway.
4. Move gently to be sure the tip is free in the back of the pharynx. In pediatric patients, depress tongue and insert airway with curve down to avoid injury to palate and pushing tongue posterior.
5. Remove airway adjunct if patient begins to vomit.

NASOPHARYENGAL AIRWAY:

1. Choose a size by measuring from the nostril to the earlobe.
2. Lubricate tube (K-Y Jelly)
3. Insert in largest nostril, along floor of nose until flange is seated at nostril. Keep curve in line with normal airway curve. If you meet resistance try the other side.

H. Listen to breathing to be sure maneuver has resolved the problem.
I. Resume ventilatory assistance or oxygenation as appropriate.

EXTREMITY SPLINTING

Indications

A. Pain, tenderness, swelling, or deformity in extremity which may be due to fracture or dislocation

B. In an unstable extremity injury, to reduce pain, limit bleeding at the site of injury, and prevent further injury to soft tissues, blood vessels or nerves

Precautions

A. Critically injured trauma patients should be packaged on a backboard and prepared for transport

B. Make sure the obvious injury is the only one. It is particularly easy to miss fractures proximal to the most visible one

C. In a stable patient where no environmental hazard exists, splinting should be done prior to moving the patient

Technique

Extremity Splinting

A. Check pulse and sensation distally prior to moving or splinting

B. Remove bracelets, watches and other constricting bands prior to splint application

C. Identify and dress open wounds

D. Choose splint to immobilize joint above and below injury

E. Apply gentle continuous traction to extremity and support fracture during splinting

F. Reduce angulated fractures (if no pulses), including open fractures, with gentle axial traction as needed to immobilize properly

G. Check distal pulses and sensation after splinting. Realign gently if adequate circulation and sensation is lost

Traction Splinting (for suspected femur fracture)

A. Remove sock and shoe and check for distal pulse and sensation

B. Identify and dress open wounds

C. Measure splint length prior to application

D. Apply gentle axial traction with support to calf and fracture site

E. Position ischial pad under buttocks, up against bony prominence (ischial tuberosity), empty patient pockets if necessary

F. Secure groin strap carefully

G. Maintain continuous traction and support fracture site throughout procedure

H. Adjust support straps to appropriate positions under leg

I. Apply ankle hitch and tighten traction until patient experiences improved comfort. (Movement at the fracture site will cause some pain, but if traction continues to cause increased pain, do not proceed. Splint and support leg in position of comfort.)

J. Secure support straps after traction is properly adjusted

K. Re-check distal pulses and sensation

Complications

A. Circulatory compromise from excessive constriction of limb

B. Continued bleeding non visible under splint

C. Pressure damage to skin and nerves from inadequate padding

D. Delayed treatment of life-threatening injuries due to prolonged splinting procedures

Side Effects and Special Notes

A. Traction splints should only be used if the leg can be straightened easily and the patient is comfortable with the traction device on. Particularly with injuries about the hip and knee, forced application for traction can cause increased pain and damage. If this occurs, do not use traction device, but support in position of most comfort and best neurovascular status.

B. When in doubt and the patient is stable splint. Do not be deceived by absence of deformity or disability.

C. Splinting body parts together can be a very effective way of immobilizing. Padding will increase comfort.

Automatic External Defibrillator

Indications

A. For unconscious, pulseless and apneic patients

Precautions

A. Do not use on trauma patients

B. Dry the chest wall if wet

C. Remove any transdermal patches

D. If an airway obstruction exists, clear the airway before using an AED

E. Remove/Extricate the patient from any wet environment prior to application.

Technique

A. Follow manufacturer directions for AED operation.

1. Determine unresponsiveness
2. Open airway, check for breathing and ventilate once with BVM if no respirations
3. Determine pulselessness. If patient pulseless, begin CPR while AED is being set up.
4. Turn on AED
5. Place patches in appropriate location based on manufacturer's guidelines and connect to machine
6. Clear the area around the patient making sure no one is touching the patient
7. Press the shock button if advised, check breathing, pulse and if necessary, begin CPR. If there is a pulse, check breathing and assist as needed.

Complications

A. Rescuer defibrillation may occur if you forget to clear the area

B. Skin burns from inadequate contact between patches and skin may occur

C. Expired AED patches can cause arching from electricity or inadequate shock and interfere with analysis.

D. Children over age 8 can be treated with a standard AED. For children ages 1-8, AHA recommends the pediatric attenuated pads. Or anterior posterior adult pad placement.

PROCEDURE PROTOCOL: TOURNIQUET PROTOCOL

Indications:

A. A tourniquet may be used to control potentially fatal hemorrhage only after other means of hemorrhage control have failed.

Precautions:

A. A tourniquet applied incorrectly can increase blood loss.
B. Applying a tourniquet can cause nerve and tissue damage whether applied correctly or not. Proper patient selection is of utmost importance.
C. Injury due to tourniquet is unlikely if the tourniquet is removed within 1 hour. In cases of life-threatening bleeding benefit outweighs theoretical risk.
D. A commercially made tourniquet is the preferred tourniquet. If none is available, a blood pressure cuff inflated to a pressure sufficient to stop bleeding is an acceptable alternative. Other improvised tourniquets are not allowed.

Technique:

A. First attempt to control hemorrhage by using direct pressure over bleeding area.
B. If a discrete bleeding vessel can be identified, point pressure over bleeding vessel is more effective than a large bandage and diffuse pressure.
C. If unable to control hemorrhage using direct pressure, apply tourniquet according to manufacturer specifications and using the steps below:
    1. Cut away any clothing so that the tourniquet will be clearly visible. NEVER obscure a tourniquet with clothing or bandages.
    2. Apply tourniquet proximal to the wound and not across any joints.
    3. Tighten tourniquet until bleeding stops. Applying tourniquet too loosely will only increase blood loss by inhibiting venous return.
    4. Mark the time and date of application on the patient's skin next to the tourniquet.
    5. Keep tourniquet on throughout hospital transport – a correctly applied tourniquet should only be removed by the receiving hospital.

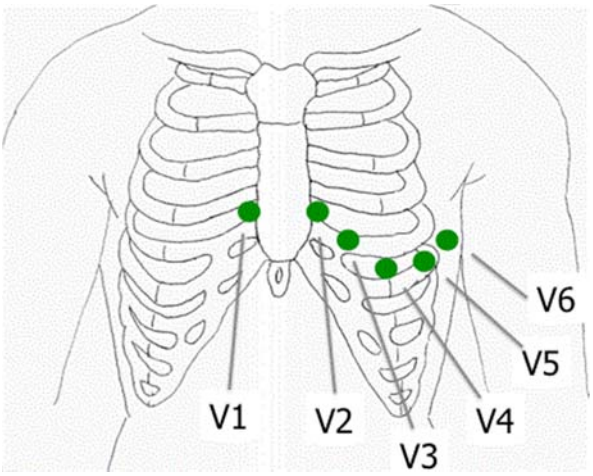
PROCEDURE PROTOCOL: ASSIST 12 LEAD EKG

Indication:

- Patient requires a 12 lead EKG, at the discretion of the ALS provider
- EKGs deliver a picture of the heart's electrical activity. This information allows for interpretation of cardiac rhythms, myocardial ischemia/infarction, conduction delays, electrolyte imbalances, and other cardiac abnormalities.

Technique:

- Connect leads with electrodes
- Expose chest
- Place 4 limb leads (RU, LU, RL, LL); do not place on bone
- Place 6 precordial leads (V1-V6)
  - V1: 4th intercostal space, right of sternum
  - V2: 4th intercostal space, left of sternum
  - V3: Between V2 and V4
  - V4: 5th intercostal space, left midclavicular line
  - V5: 5th intercostal space, left anterior axillary line
  - V6: 5th intercostal space, left midaxillary line
- Connect precordial lead cable to limb lead cable
- Press "12-LEAD" on LifePak Monitor
- Select patient's gender and age using black turn dial, when prompted



Precautions:

- A 12 lead EKG can feel invasive to a patient. When possible, inform patient of procedural steps and procure an appropriate work-up site (with consideration for patient modesty and at the direction of the ALS provider).
- Patient movement can inhibit 12 lead interpretation. Instruct the patient to remain still. If excessive artifact exists (at discretion of ALS provider), consider adjusting limb lead placement to a more proximal position.

Special Considerations:

- If patient heart rate is tachycardic, bradycardic, or irregular:
- Obtain a detailed history: patient or family history of cardiac disease, presence of cardiac medications, compliance with cardiac medications
- Search for possible contributing factors: "5 Hs and 5 Ts"
- ALS assessment is indicated

Common Cardiac Medications:

- Antiplatelet agent (eg. ASA, Plavix)
- Anticoagulant (eg. Coumadin, Heparin, Eliquis, Xarelto, Pradaxa)
- Beta blocker ("-olol")
- Calcium channel blocker ("-pine")
- ACE inhibitor ("-pril")
- Angiotensin-Receptor Blocker ("-artan")
- Diuretic (eg. Lasix, HCTZ)
- Vasodilator (eg. Nitrates

PROCEDURE PROTOCOL: CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

Indications:

- Patient requires CPAP, at the discretion of the ALS provider
- CPAP provides continuous positive pressure during spontaneous respiration, forcing air into the alveoli and improving oxygenation and ventilation.

Contraindications:

- Respiratory or cardiac arrest
- Systolic BP less than 90mmHg
- Lack of airway protective reflexes
- Significant altered level of consciousness such that unable to follow verbal instructions or signal distress
- Vomiting or active upper GI bleed
- Suspected pneumothorax
- Trauma
- Patient size or anatomy prevents adequate mask seal

Technique:

1. Place patient in a seated position and explain the procedure to him or her
2. Assess vital signs (BP, HR, RR, SpO_2, and $ETCO_2$)
3. Apply the CPAP mask and secure with provided straps, progressively tightening as tolerated to minimize air leak
4. Operate CPAP device according to manufacturer specifications
5. Start with the lowest continuous pressure that appears to be effective. Adjust pressure following manufacturer instructions to achieve the most stable respiratory status utilizing the signs described below as a guide
6. Monitor patient continuously, record vital signs every 5 minutes.
7. Assess patient for improvement as evidenced by the following:
    a. Reduced dyspnea
    b. Reduced verbal impairment, respiratory rate and heart rate
    c. Increased SpO_2
    d. Stabilized blood pressure
    e. Appropriate $ETCO_2$ values and waveforms
    f. Increased tidal volume
8. Observe for signs of deterioration or failure of response to CPAP:
    a. Decrease in level of consciousness
    b. Sustained or increased heart rate, respiratory rate or decreased blood pressure
    c. Sustained low or decreasing SpO_2 readings
    d. Rising $ETCO_2$ levels or other $ETCO_2$ evidence of ventilatory failure
    e. Diminished or no improvement in tidal volume

Precautions:

- Should patient deteriorate on CPAP:
    - Alert ALS provider
    - Troubleshoot equipment
    - Assess for possibility of hypotension due to significantly reduced preload from positive pressure ventilation
- Some fixed pressure CPAP devices do not have FiO2 adjustment and will only administer up to 30% oxygen. If no improvement in oxygenation with a fixed pressure CPAP device, consider adding supplemental oxygen.

PROCEDURE PROTOCOL: CAPNOGRAPHY

Indications:

- Patient requires capnography, at the discretion of the ALS provider
- Capnography measures the amount of CO_2 in exhaled air. It is used to assess ventilation, which reflects respiratory status, disease etiology, response to treatment, and metabolic state.

Contraindications:

A. None

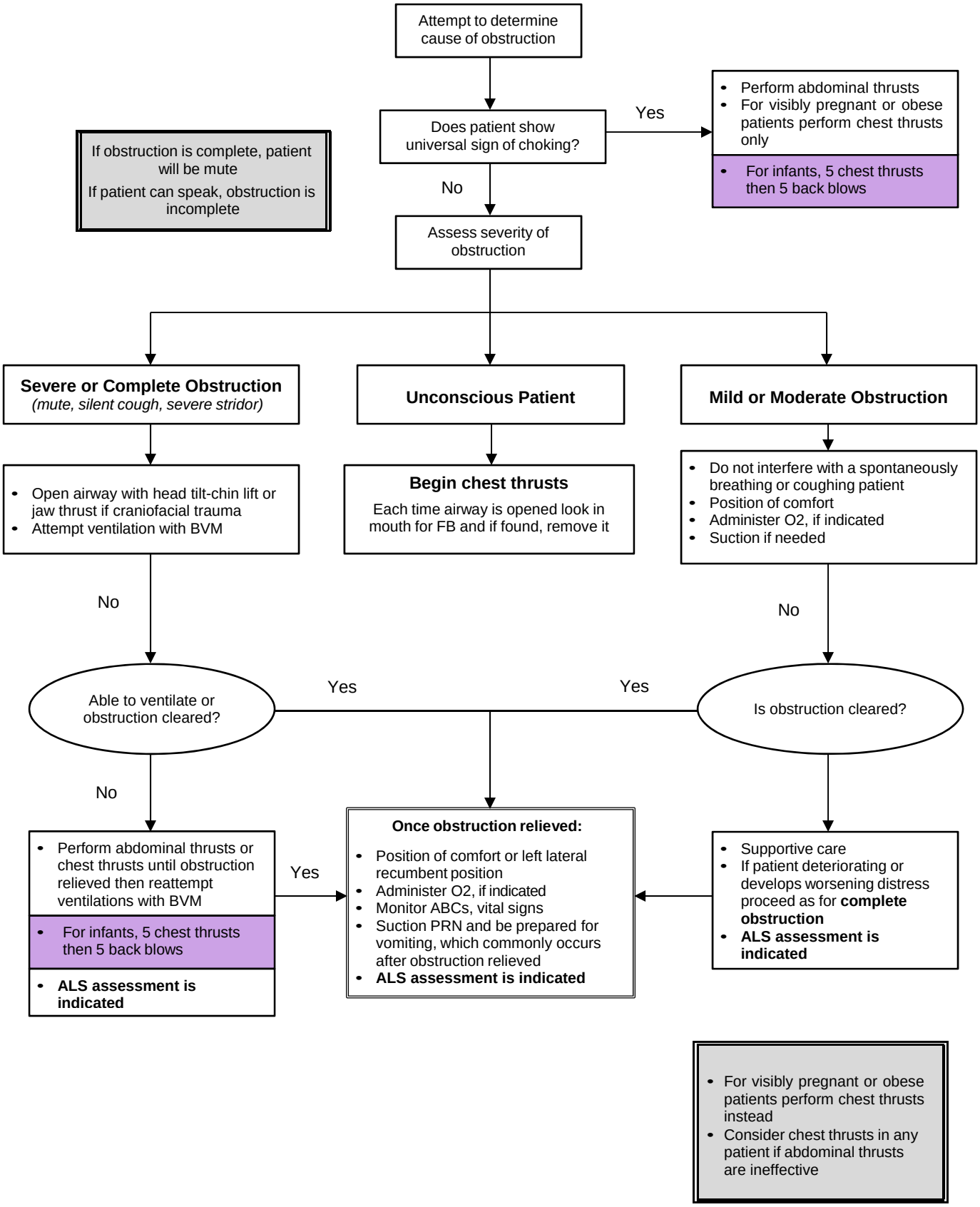
Technique:

A. In patient with ETT or advanced airway: place ETCO2 detector in-line between airway adaptor and BVM after airway positioned and secured
B. Patients without ETT or advanced airway in place: place ETCO2 cannula on patient. May be placed under CPAP or NRB facemask

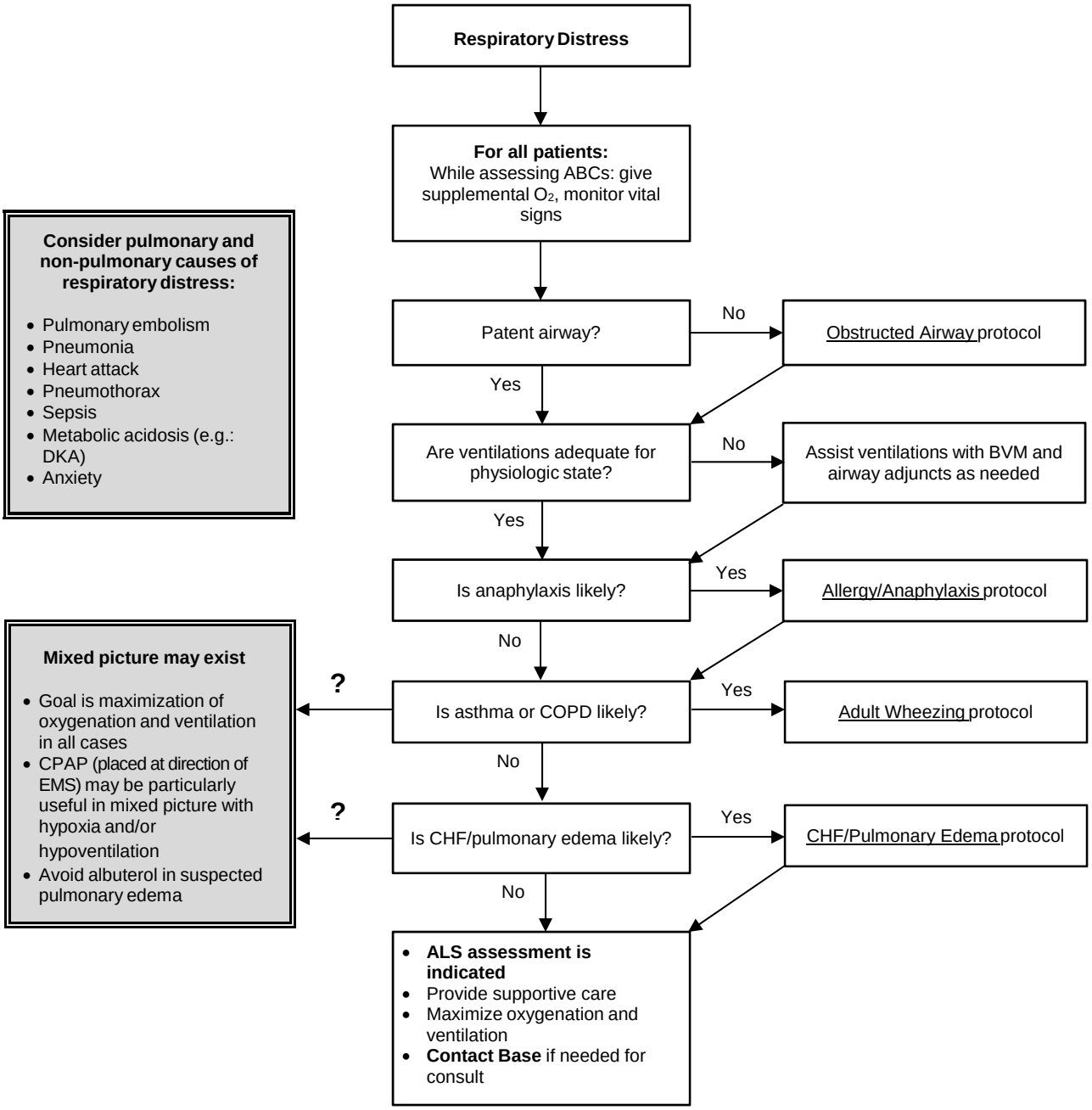
Precautions:

A. To understand and interpret capnography, remember the 3 determinants of ETCO2:
    1. Alveolar ventilation
    2. Pulmonary perfusion
    3. Metabolism
B. Sudden loss of ETCO2:
    1. Tube dislodged
    2. Circuit disconnected
    3. Cardiac arrest
C. High ETCO2 (> 45)
    1. Hypoventilation/CO2 retention
D. Low ETCO2 (< 25)
    1. Hyperventilation
    2. Low perfusion: shock, PE, sepsis
E. Cardiac Arrest:
    1. In low-pulmonary blood flow states, such as cardiac arrest, the primary determinant of ETCO2 is blood flow, so ETCO2 is a good indicator of quality of CPR
    2. If ETCO2 is dropping, change out person doing chest compressions
    3. In cardiac arrest, if ETCO2 not > 10 mmHg after 20 minutes of good CPR, this likely reflects very low CO2 production and is associated with poor outcome
    4. Sudden rise in EtCO2 may be an indicator of ROSC

OBSTRUCTED AIRWAY



ADULT UNIVERSAL RESPIRATORY DISTRESS



ADULT WHEEZING

Therapeutic Goals:

- Maximize oxygenation
- Decrease work of breathing
- Identify complications, e.g. pneumothorax

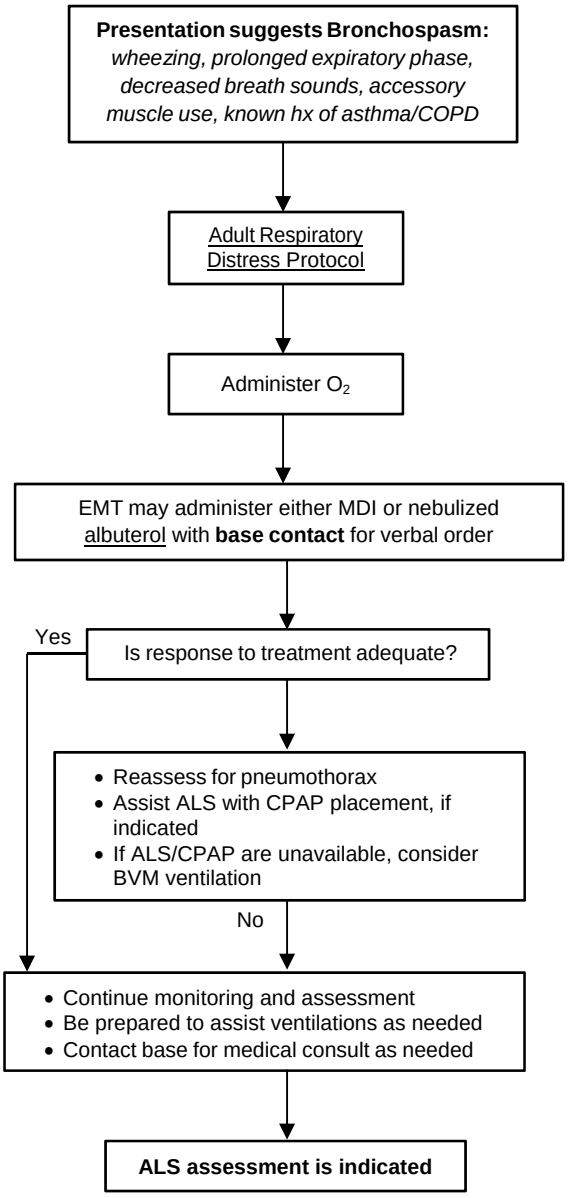
Consider pulmonary and non-pulmonary causes of respiratory distress:

Examples: pulmonary embolism, pneumonia, pulmonary edema, anaphylaxis, heart attack, pneumothorax, sepsis, metabolic acidosis (e.g.: DKA), Anxiety

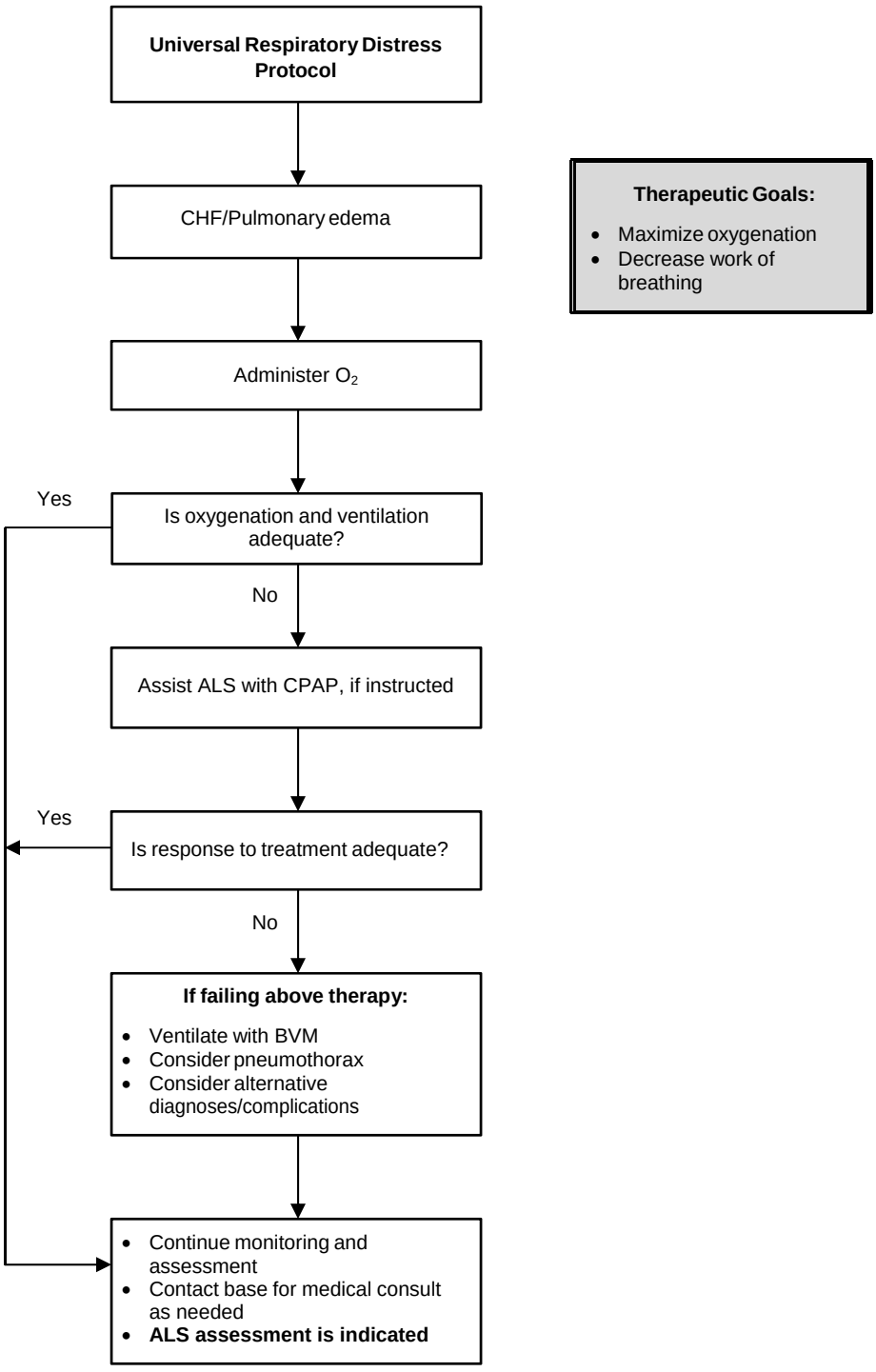
- Wheezing may be a presentation of pulmonary edema, "cardiac asthma"
- Albuterol should be used with caution in patients with a known hx of CHF

COPD

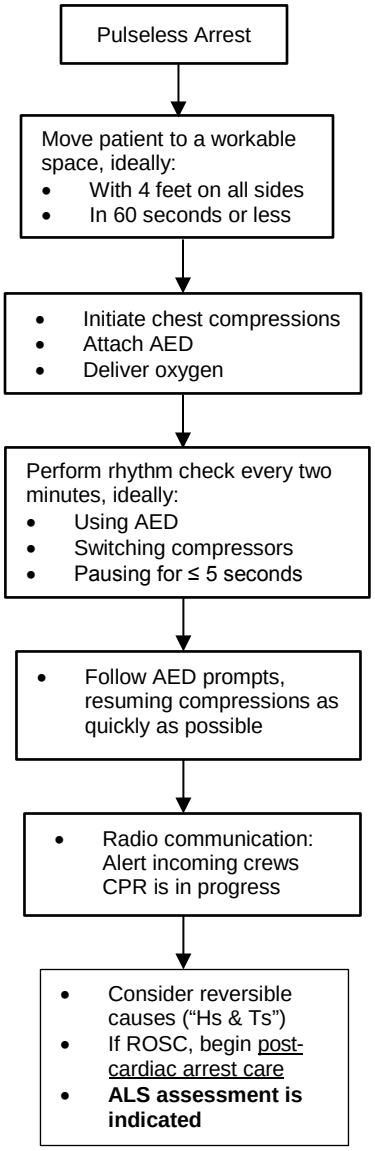
- **Correct hypoxia**: do not withhold maximum oxygen for fear of CO_2 retention
- Patients with COPD are older and have comorbidities, including heart disease.
- Common triggers for COPD exacerbations include: Infection, dysrhythmia (e.g.: atrial fibrillation), myocardial ischemia



CHF/PULMONARY EDEMA



UNIVERSAL PULSELESS ARREST ALGORITHM



See 3010 Universal Pulseless Arrest Considerations for additional pulseless arrest guidelines, including:

- Compressions
- Defibrillation
- Ventilations
- Airway
- ROSC

Reversible Causes:

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis (pulmonary, coronary)

UNIVERSAL PULSELESS ARREST CONSIDERATIONS

ADULT PATIENT

Compressions

- Minimize interruptions, resume compressions immediately after shocks, rhythm checks
- Push hard (≥ 2 inches) and fast (100-120/min) and allow complete chest recoil
- If available, use metronome to monitor compression rate
- If using automated CPR devices, use manufacturer's specifications

Defibrillation

- Use adult electrode pads
- Follow AED prompts

Ventilations

- Open the airway, place NPA/OPA, place NRB facemask with O_2 at 15 L/min
- After 3 cycles (6 minutes), ventilate every 10 compressions, without pausing compressions
- Do not overventilate

Airway

- ALS may place an advanced airway (iGel, ETT)
- ETT is preferred for adults

ROSC

- Pulse and blood pressure
- Sustained abrupt rise in $ETCO_2$, typically > 40

PEDIATRIC PATIENT

Compressions

- Minimize interruptions, resume compressions immediately after shocks, rhythm checks.
- Push hard (≥ 1/3 of anteroposterior chest diameter) and fast (100-120/min) and allow complete chest recoil
- If available, use metronome to monitor compression rate

Defibrillation

- Use pediatric electrode pads
- Follow AED prompts

Ventilations

- Open the airway, place NPA/OPA, ventilate every 10 compressions, without pausing compressions
- Do not over ventilate

Airway

- BVM preferred for all pediatric patients
- ALS may place an advanced airway (iGel or ETT) if BVM ventilations are inadequate

ROSC

- Pulse and blood pressure
- Sustained abrupt rise in $ETCO_2$, typically > 40

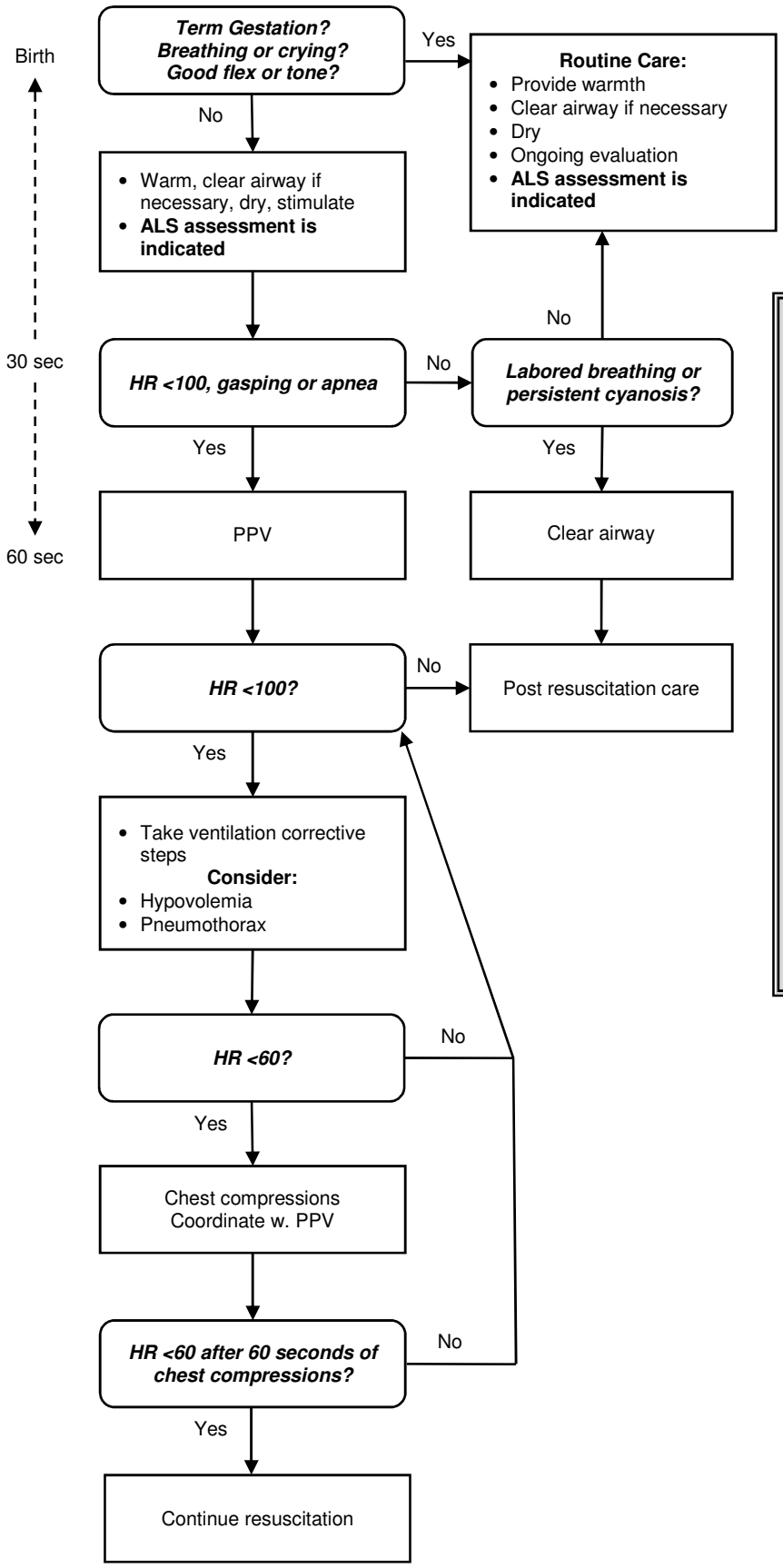
Regarding where to work arrest and presence of family members:

- In general, work cardiac arrest on scene either to return of spontaneous circulation (ROSC), or to field pronouncement, unless scene unsafe
- Family presence during resuscitation is preferred by most families, is rarely disruptive, and may help with grieving process for family members. Family presence during resuscitation is recommended, unless disruptive to resuscitation efforts
- **ALS assessment is indicated** prior to termination of resuscitation

ICD/Pacemaker patients

If cardiac arrest patient has an implantable cardioverter defibrillator (ICD) or pacemaker: place defib pads at least 1 inch from device. Biaxillary or anterior posterior pad placement may be used

NEONATAL RESUSCITATION



General Considerations
(From 2015 AHA Guidelines)

- Initial resuscitation steps should be completed within 60 seconds as illustrated
- The decision to progress beyond initial steps is based on an assessment of respirations (apnea, gasping, labored, or unlabored breathing) and heart rate (>/< 100 bpm)

Assisting Ventilations

- Assist ventilations at a rate of 40-60 breaths per minute to maintain HR > 100
- Use 2 person BVM when possible

Chest Compressions

- Indicated for HR < 60 despite adequate ventilation w. supplemental O_2 for 30 seconds
- 2 thumbs-encircling hands technique preferred
- Allow full chest recoil
- Coordinate with ventilations so not delivered simultaneously
- 3:1 ratio for compressions to ventilations

POST-RESUSCITATION CARE WITH ROSC

Post-Cardiac Care

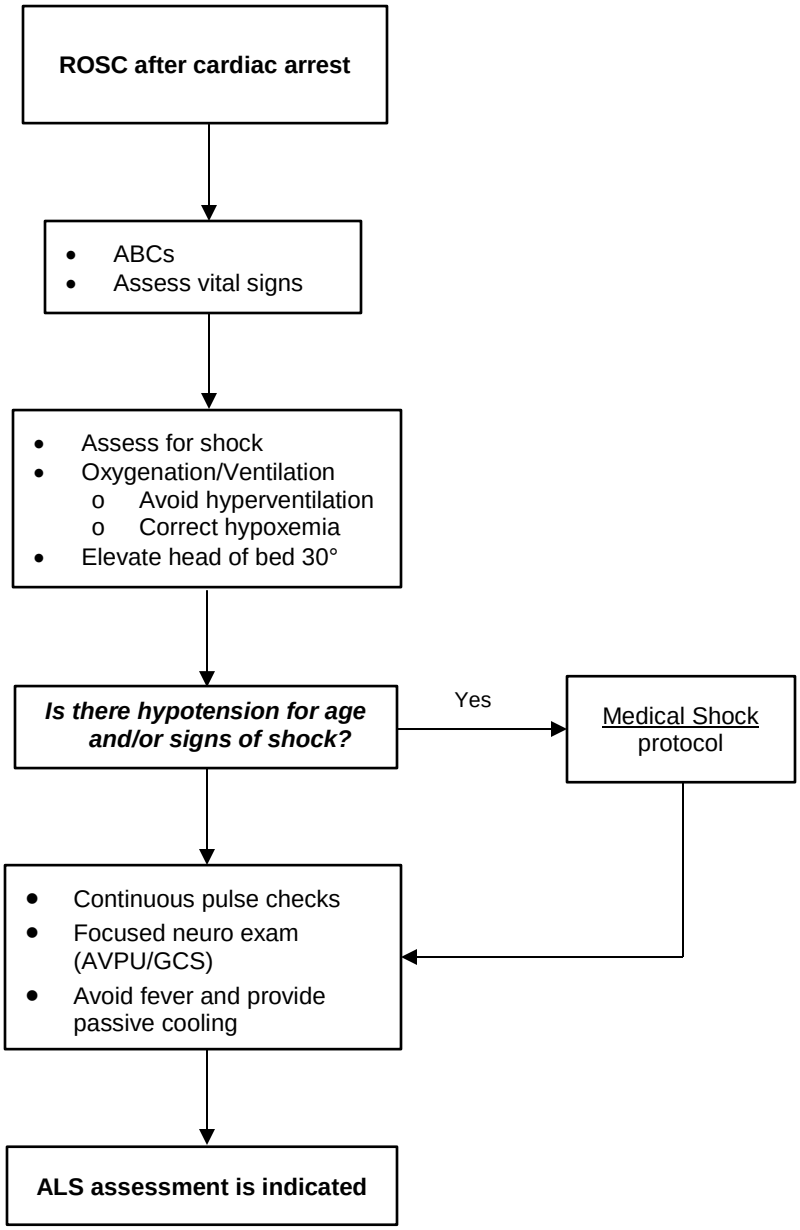
- Following ROSC, several simultaneous and stepwise interventions must be performed to optimize care and maximize patient outcome
- Survival and neurologic outcome worsen with fever, hypoxia, and hypotension. Post-ROSC care should focus on prevention of these elements

Return of spontaneous circulation (ROSC) criteria:

Pulse and measurable blood pressure

Document:

- Time of arrest (or time last seen normal)
- Witnessed vs. unwitnessed arrest
- Initial rhythm shockable vs. non-shockable
- Bystander CPR given
- Time of ROSC
- GCS after ROSC
- Initial temperature of patient



CHEST PAIN, POSSIBLY CARDIAC

Before treating cardiac chest pain, consider non-cardiac causes.

- While assessing ABCs give supplemental oxygen and monitor vital signs
- Administer aspirin if history suggests possible cardiac chest pain
- Confirm ALS is responding

ALS on scene

No

Yes

Assist with patient prescribed nitroglycerin if suspected cardiac chest pain and no contraindication, **Contact Base** for verbal order

Reassess vital signs between nitroglycerin administrations. For hypotension following nitroglycerin, do not give additional doses.

Assist with 12 lead EKG placement, at direction of ALS provider

Non-cardiac causes of chest pain:

- Can include: trauma, pulmonary, anxiety
- If etiology is unclear, **Contact Base** for guidance

Contraindications:

- Hypotension SBP < 100
- Use of erectile dysfunction (ED) medication (e.g. Viagra, Cialis)

Causes of Chest Pain in Children:

- Costochondritis
- Pulmonary Causes
- Ischemia Is rare but can be seen with a history of Kawasaki's disease with coronary aneurysms
- Cyanotic or Congenital Heart Disease
- Myocarditis
- Pericarditis
- Arrhythmia
- Anxiety
- Abdominal Causes

GENERAL MEDICAL CARE

- BSI
- Scene safety
- Consider nature of illness
- Consider need for additional resources

- General impression
- Level of Consciousness (AVPU)
- Assess and manage ABCs
- Administer O_2, if indicated

- Rapid Medical Assessment
- Obtain a complete set of vital signs

- SAMPLE history
- Complete secondary assessment, as indicated

Hypotension for Age and/or signs of poor perfusion

- If possible, position supine
- Consider etiology of shock state

ALS assessment is indicated

Hypotension for Age

Age	Blood Pressure
<1 year	<70 mmHg
1-10 years	<70 + (2 x age in years)
>10 years	<90 mmHg

Tachycardia for Age

Age	Heart Rate
<1 year	>160 bpm
1-2 years	>150 bpm
2-5 years	>140 bpm
5-12 years	>120 bpm
>12 years	>100 bpm

Etiologies of Shock:

- Dysrhythmia, myocardial ischemia
- Sepsis
- Hemorrhage
- Anaphylaxis
- Overdose
- Cyanide or carbon monoxide poisoning
- Other: PE, MI, tension pneumothorax

Scene Considerations:

- Locate and document all patient medications, whenever possible
- Locate medical paperwork (eg. DNR, hospital discharge instructions)
- Note and document drug and alcohol paraphernalia
- Note and document scene conditions (eg. patient location on arrival, general living conditions, notable belongings)

SYNCOPE

- Assess and stabilize ABCs
- Administer O_2, if indicated
- Complete set of vital signs
- Perform and document neurologic exam

↓

Consider etiology

↓

ALS assessment is indicated

Causes of Syncope:

- Cardiac
  - Structural heart disease (eg. valvular disorder, heart failure, myocardial infarct)
  - Arrhythmia
- Seizure
- Hypovolemia
  - Dehydration
  - Blood loss
  - Pregnancy/ectopic
- Pulmonary Embolism
- Vasovagal

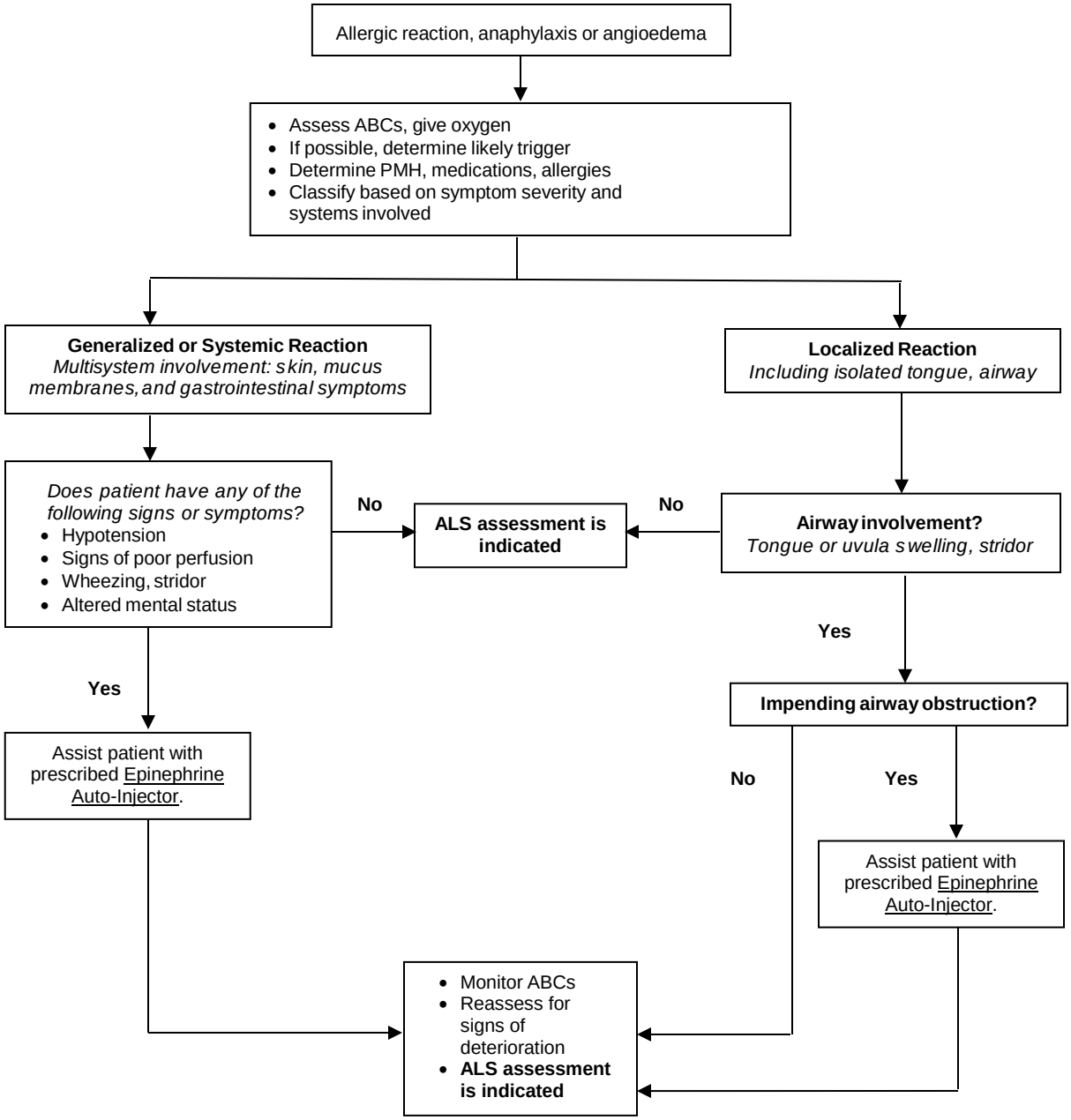
General Information:

- Syncope is defined as transient loss of consciousness accompanied by loss of postural tone.
- A syncopal episode will generally be very brief and have a rapid recovery with no postictal confusion.
- Convulsive movements called myoclonic jerks may occur with syncope. This is often confused with seizures, but should not be accompanied by a post-ictal phase, incontinence or tongue biting.
- Elderly syncope has a high risk of morbidity and mortality

Pediatric Considerations:

- Life-threatening causes of pediatric syncope are usually cardiac in etiology (arrhythmia, cardiomyopathy, myocarditis, or previously unrecognized structural lesions)
- In addition to the causes listed above, consider the following in the pediatric patient:
  - Seizure
  - Breath holding spells
  - Toxins (marijuana, opioids, cocaine, CO, etc.)
  - Heat intolerance
  - BRUE (Brief Resolved Unexplained Events, formerly ALTE)
- Important historical features of pediatric syncope include: color change, seizure activity, incontinence, post-ictal state, and events immediately prior to syncope event

ALLERGY AND ANAPHYLAXIS



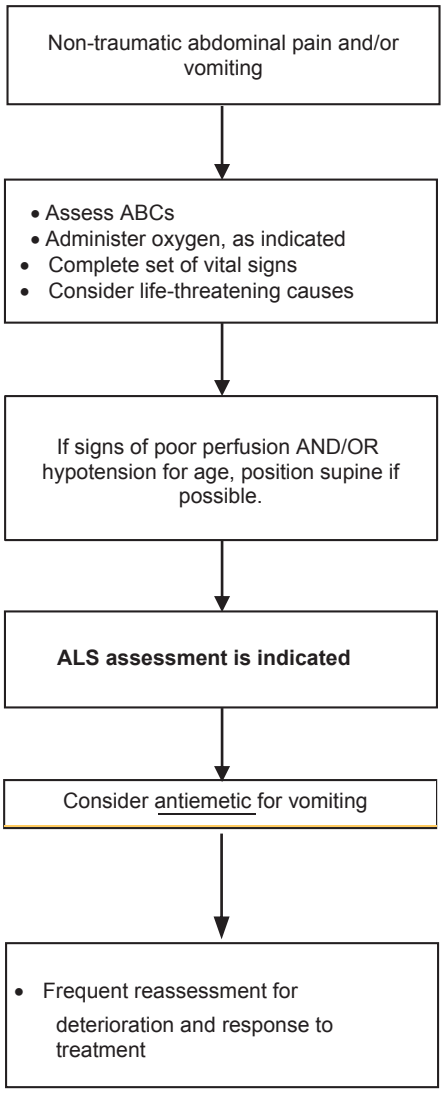
Definitions:

- **Anaphylaxis**: severe allergic reaction that is rapid in onset and potentially life-threatening. Multisystem signs and symptoms are present including skin and mucus membranes
  - **Mainstay of treatment is epinephrine**
- **Angioedema**: deep mucosal edema causing swelling of mucus membranes of upper airway. May accompany hives
  - **Epinephrine indicated for any impending airway obstruction.**

Document:

- History of allergen exposure, prior allergic reaction and severity, medications or treatments administered prior to EMS assessment
- Specific symptoms and signs presented: itching, wheezing, respiratory distress, nausea, weakness, rash, anxiety, swelling of face, lips, tongue, throat, chest tightness, etc.

NON-TRAUMATIC ABDOMINAL PAIN/VOMITING



Life-threatening causes:

- Cardiac etiology: MI, ischemia
- Vascular etiology: AAA, dissection
- GI bleed
- Gynecologic etiology: ectopic pregnancy

History:

- Onset, location, duration, radiation of pain
- Associated sx: vomiting, bilious emesis, GU sx, hematemesis, coffee ground emesis, melena, rectal bleeding, vaginal bleeding, known or suspected pregnancy, recent trauma

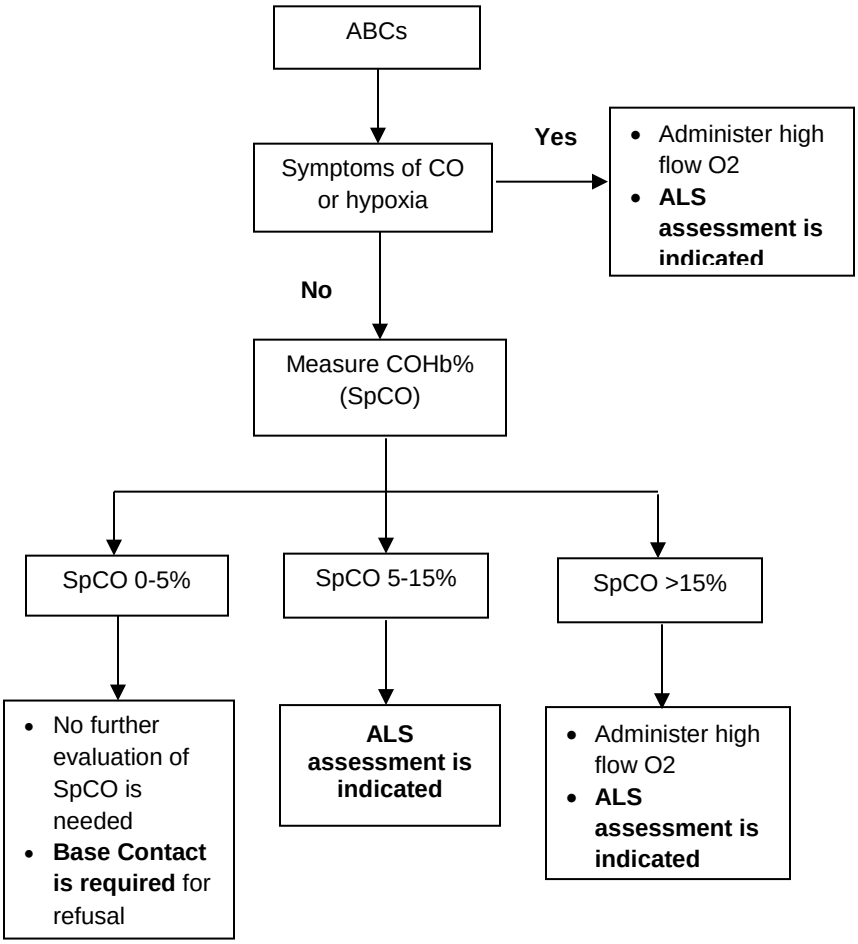
Pediatric Patients:

- Life-threatening causes vary by age. Consider occult or non-accidental trauma, toxic ingestion, button battery ingestion, GI bleed, peritonitis

Elderly Patients:

- Much more likely to have life-threatening cause of symptoms
- Shock may be occult, with absent tachycardia in setting of severe hypovolemia

SUSPECTED CARBON MONOXIDE EXPOSURE

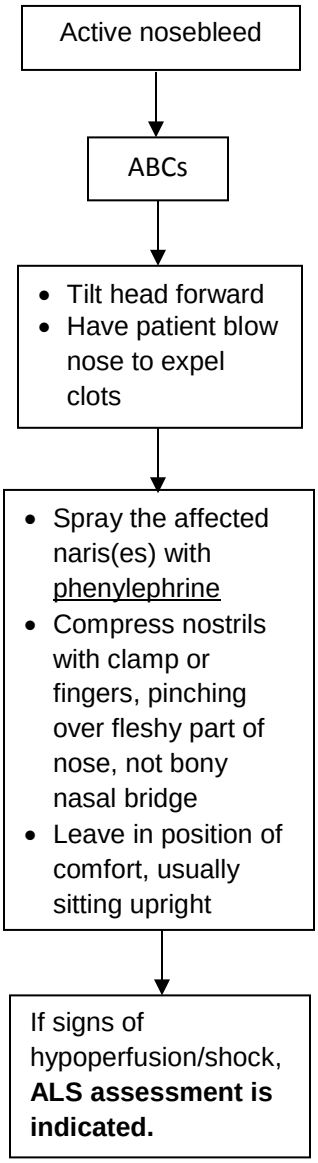


General Guidelines:

- *Signs and Symptoms of CO exposure include:*
  Headache, dizziness, coma, altered mentation, seizures, visual changes, chest pain, tachycardia, arrhythmias, dyspnea, N/V, "flu-like illness"
- The absence or low readings of COHb is not a reliable predictor of toxicity of other fire byproducts.
- The fetus of a pregnant woman is at higher risk due to the greater affinity of fetal hemoglobin to CO. With CO exposure, the pregnant woman may be asymptomatic while the fetus may be in distress. In general, pregnant patients exposed to CO should receive **ALS assessment**.
- Cigarette smokers' COHb is normally higher than nonsmokers; >10% is clinically significant.

COHb	Severity	Signs and Symptoms
<15-20%	Mild	Headache, nausea, vomiting, dizziness, blurred vision
21-40%	Moderate	Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness
41-59%	Severe	Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest
>60%	Fatal	Death

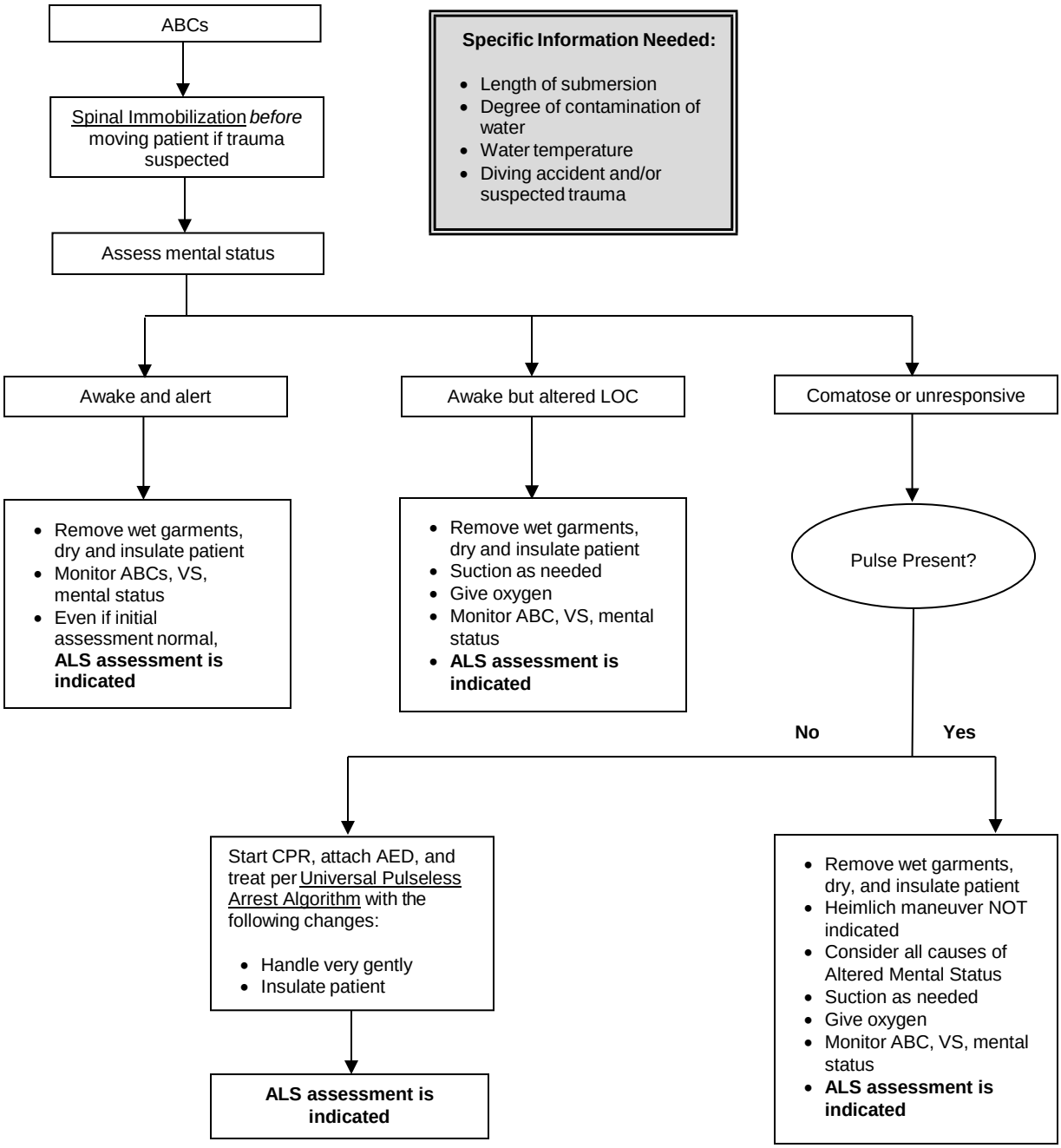
EPISTAXIS MANAGEMENT



General Guidelines:

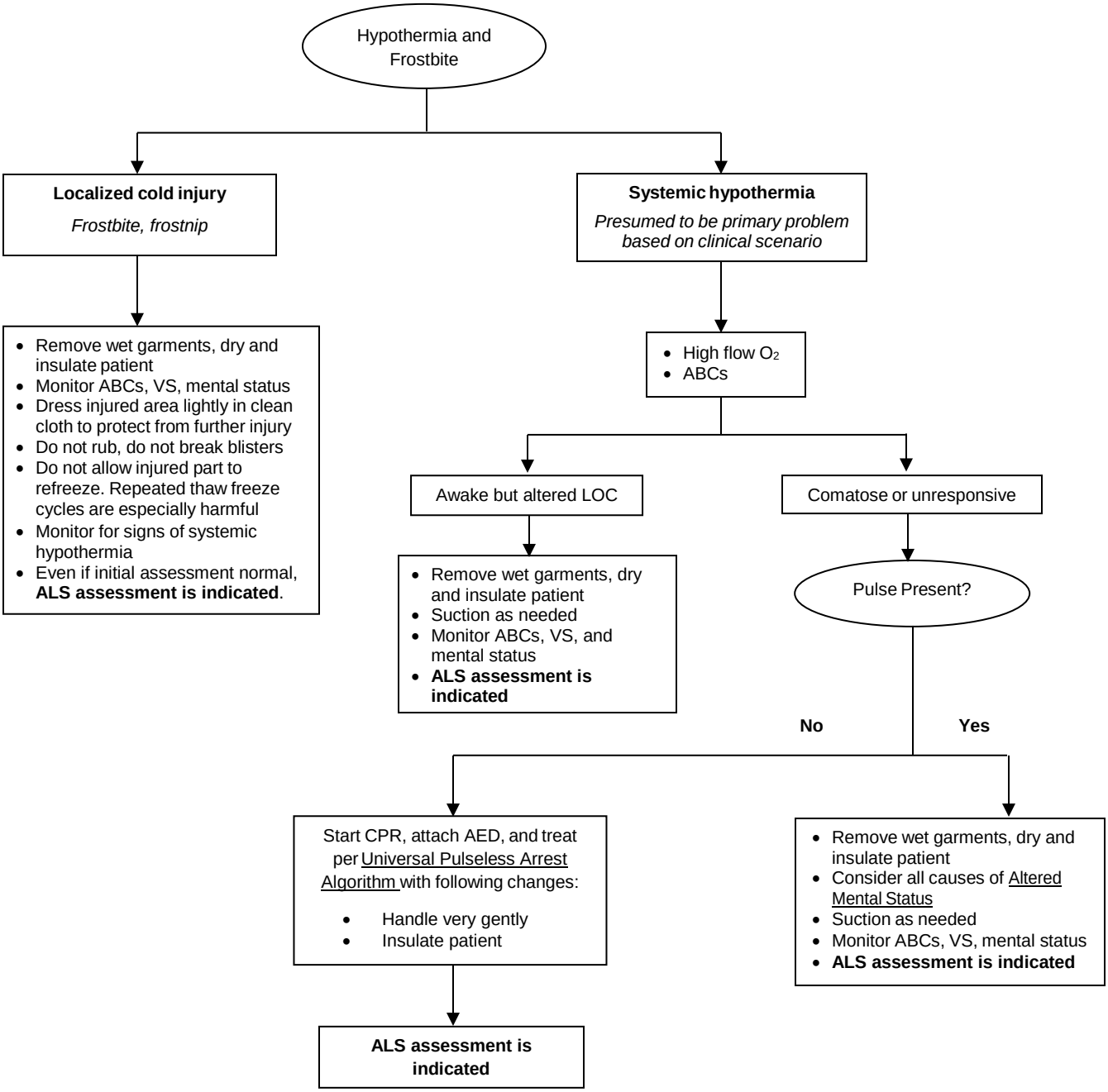
- Most nose bleeding is from an anterior source and may be easily controlled.
- Avoid phenylephrine in pts with known heart disease (CAD).
- Anticoagulation with aspirin, clopidogrel (Plavix), warfarin (Coumadin) will make epistaxis much harder to control. Note if your patient is taking these, or other, anticoagulant medications.
- Posterior epistaxis is a true emergency and will require advanced ED techniques such as balloon tamponade or interventional radiology. **ALS assessment is indicated**. Be prepared for potential airway issues.
- For patients on home oxygen via nasal cannula, place the cannula in the patient's mouth while nares are clamped or compressed for nosebleed.

DROWNING



- Drowning/submersion commonly associated with hypothermia.
- Even profound bradycardias may be sufficient in setting of severe hypothermia and decreased O_2 demand
- Good outcomes after even prolonged hypothermic arrest are possible, therefore patients with suspected hypothermia should always receive an **ALS assessment**.
- Pulse and respirations may be very slow and difficult to detect if patient is severely hypothermic. If no definite pulse, and no signs of life, begin CPR.
- If not breathing, start rescue breathing.
- Delayed pulmonary edema may occur after drowning.

HYPOTHERMIA



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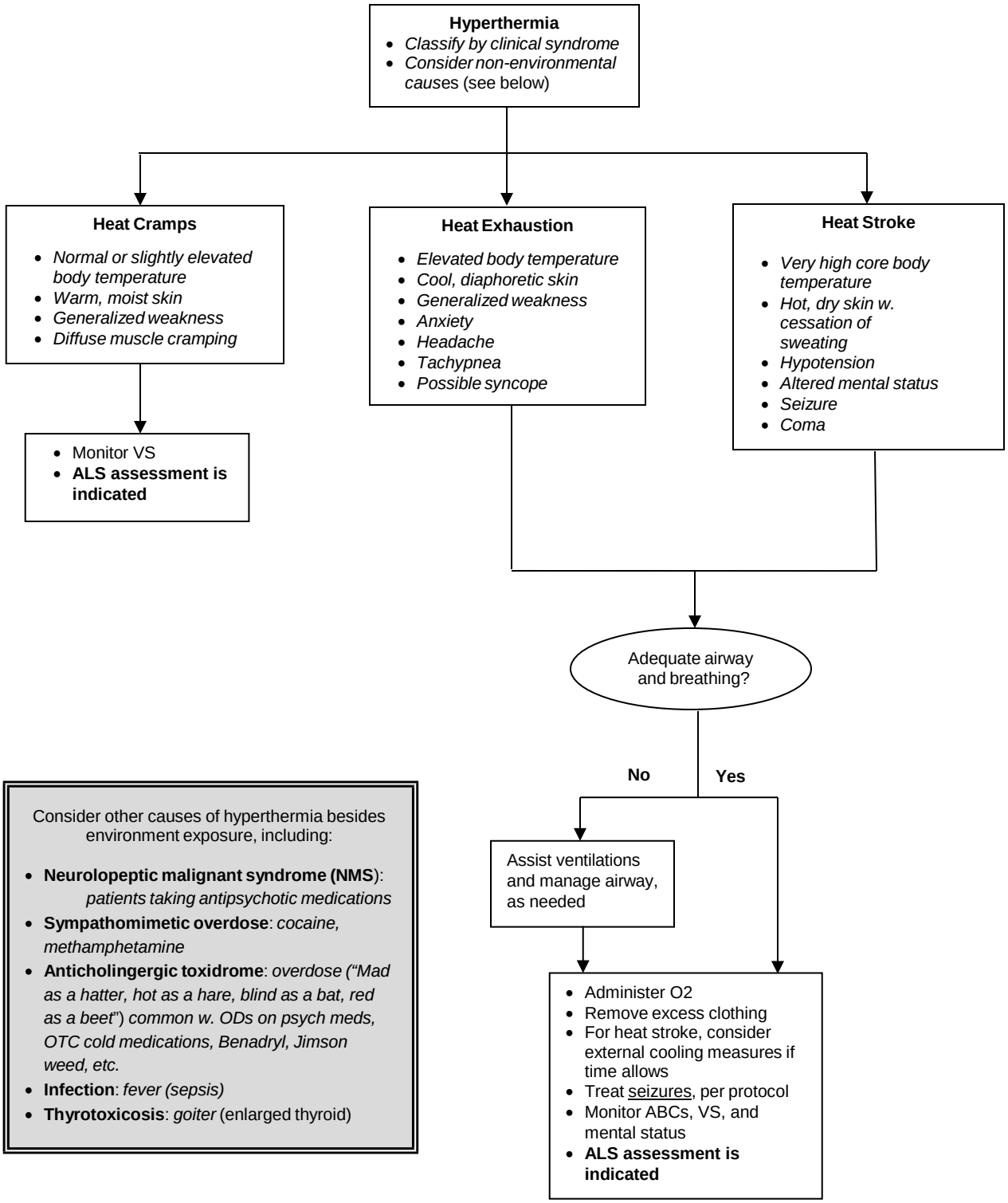
- If not breathing, start rescue breathing

HYPERTHERMIA



GENERAL TRAUMA CARE

- BSI
- Scene safety
- Consider mechanism
- Consider need for additional resources

↓

- General impression
- Level of Consciousness (AVPU)
- Assess and manage ABCs
- Administer O_2, if indicated

↓

- Rapid Trauma Assessment

↓

Control Exsanguinating Hemorrhage:

- Direct pressure
- Tourniquet protocol if indicated
- Pelvic stabilization if suspected unstable pelvis based on physical exam

↓

- Prepare for immediate transport, with spinal immobilization if indicated
- SAMPLE history

↓

Assess Disability and Limitation:

- Brief neuro assessment
- Extremity splinting if indicated

↓

Continue to monitor ABCs, vital signs, and neurologic status (AVPU and GCS)

If patient appears unstable, consider traumatic shock:

- **ALS assessment is indicated**
- Prepare for immediate transport
- Keep patient warm

Hypotension for Age

Age	Blood Pressure
<1 year	<70 mmHg
1-10 years	<70 + (2 x age in years)
>10 years	<90 mmHg

Tachycardia for Age

Age	Heart Rate
<1 year	>160 bpm
1-2 years	>150 bpm
2-5 years	>140 bpm
5-12 years	>120 bpm
>12 years	>100 bpm

Pediatric Shock

Signs of Compensated Shock

- Normal mental status
- Normal systolic blood pressure
- Tachycardia
- Prolonged (>2 seconds) capillary refill
- Tachypnea
- Cool and pale distal extremities
- Weak peripheral pulse

Signs of Decompensated Shock

- Decrease in mental status
- Weak central pulses
- Poor color
- Hypotension for age

TRAUMA IN PREGNANCY

See General Trauma Care protocol

Pregnant Trauma (EGA < 20 weeks)

- Priority is mother.
- All patients with any thoracic, abdominal, pelvic injury or complaint should receive **ALS assessment**.

Pregnant Trauma (EGA ≥ 20 weeks)

- Priority is mother.
- **ALS assessment is indicated.**
- Assure ALS is aware of pregnancy and EGA

Patients with any thoracic, abdominal, or pelvic complaint or injury may require prolonged fetal monitoring in hospital, even if asymptomatic at time of evaluation, and even for seemingly minor mechanism

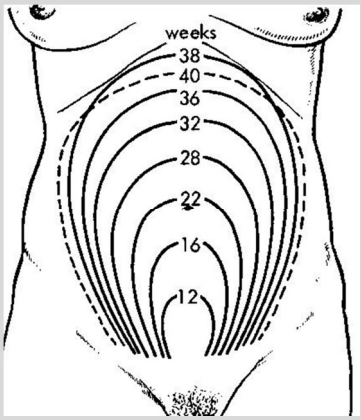
- Avoid supine position:
  - Place in left lateral recumbent position if possible
  - If immobilized tilt backboard 15 to 30 degrees to the left side

Interpret VS with caution. Pregnant patient has:

- *Increased heart rate*
- *Decreased blood pressure*
- *Increased blood volume*

Estimated Gestational Age (EGA)

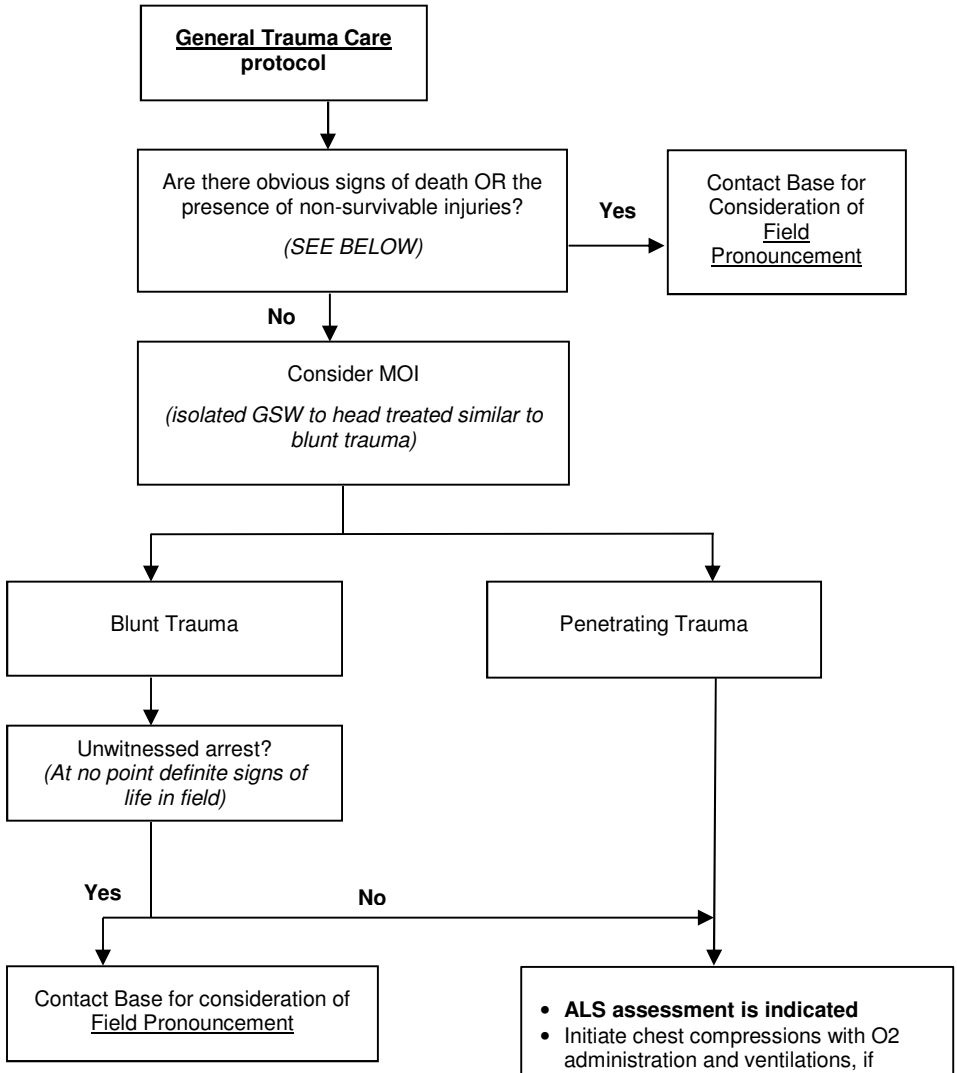
If EGA ≥ 20 weeks, consider two patients: mother and fetus. Estimation of gestational age may be made based on fundal height by palpating for top of uterus:



If uterus is at umbilicus then EGA > 20 weeks

Estimation by Last Menstrual Period:
Due Date = LMP + 9 months + 7 days
EGA = current date - date of last menstrual period
If available, utilize pregnancy wheel to determine EGA.

TRAUMATIC PULSELESS ARREST



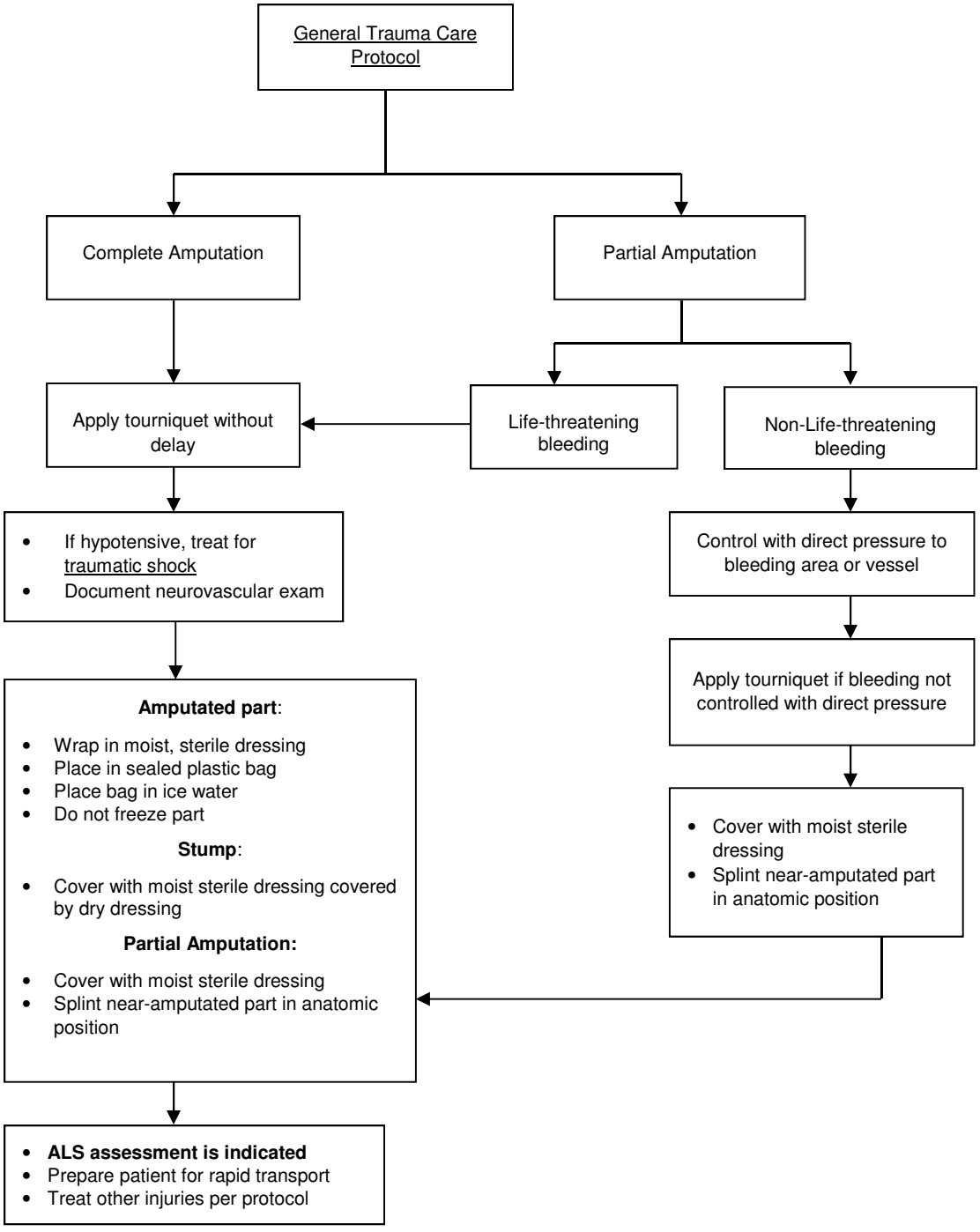
Non-survivable Injuries

- Decapitation
- 90% 3º burns
- Evidence of *massive* blunt head, chest, or abdominal trauma

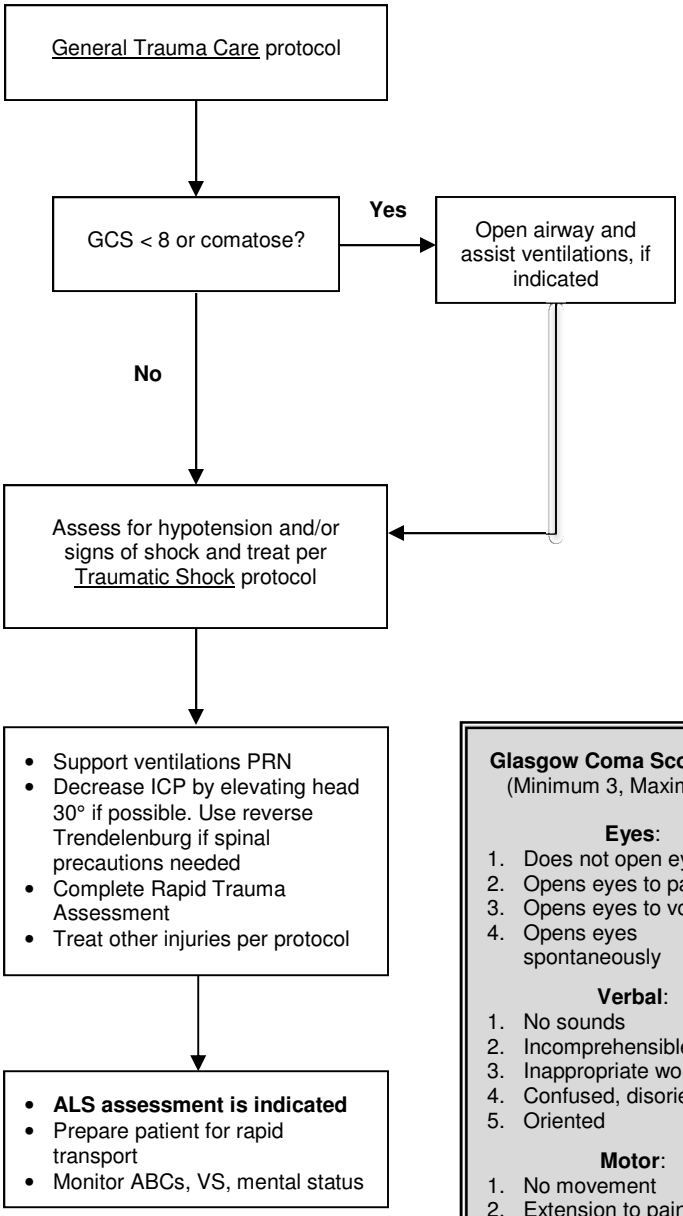
Document:

- General impression
- Mechanism: blunt vs. penetrating
- Time and duration of arrest
- Were vital signs present at any time?

AMPUTATIONS



HEAD TRAUMA PROTOCOL



Glasgow Coma Score (GCS)
(Minimum 3, Maximum 15)

Eyes:
1. Does not open eyes
2. Opens eyes to pain
3. Opens eyes to voice
4. Opens eyes spontaneously

Verbal:
1. No sounds
2. Incomprehensible sounds
3. Inappropriate words
4. Confused, disoriented
5. Oriented

Motor:
1. No movement
2. Extension to painful stimuli
3. Flexion to painful stimuli
4. Withdrawal to painful stimuli
5. Localizes to painful stimuli
6. Obeys commands

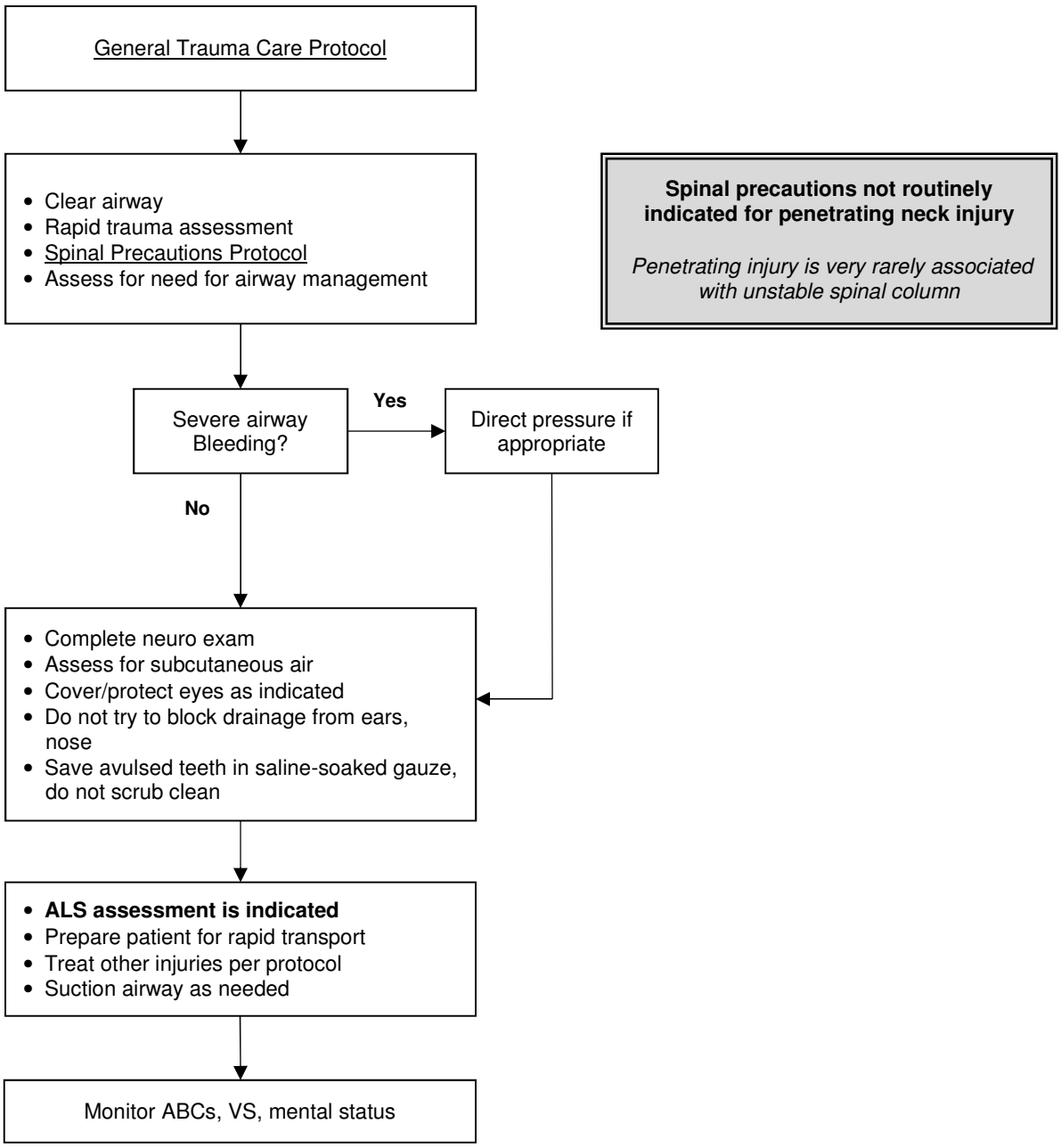
Pediatric GCS
(Minimum 3, Maximum 15)

Eyes:
1. Does not open eyes
2. Opens eyes to pain
3. Opens eyes to voice
4. Opens eyes spontaneously

Verbal:
1. No vocal response
2. Inconsolable, agitated
3. Inconsistently consolable, moaning.
4. Cries but consolable, inappropriate interactions.
5. Smiles, oriented to sounds, follows objects, interacts

Motor:
1. No motor response.
2. Extension to pain.
3. Flexion to pain.
4. Withdrawal from pain
5. Localizes pain.
6. Obeys Commands.

FACE AND NECK TRAUMA



SPINAL TRAUMA

Patient with signs of traumatic acute spinal cord injury

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General Trauma Care protocol

↓

- Full spinal precautions if any neurological signs and symptoms consistent with a spine injury are present
- Document neuro assessments before and after immobilization

↓

- **ALS assessment is indicated**
- Prepare patient for rapid transport

↓

If hypotension and/or signs of shock, treat for Traumatic Shock

↓

- Complete patient assessment
- Treat other injuries per protocol
- Monitor for status changes

↓

Monitor ABCs, VS, mental status

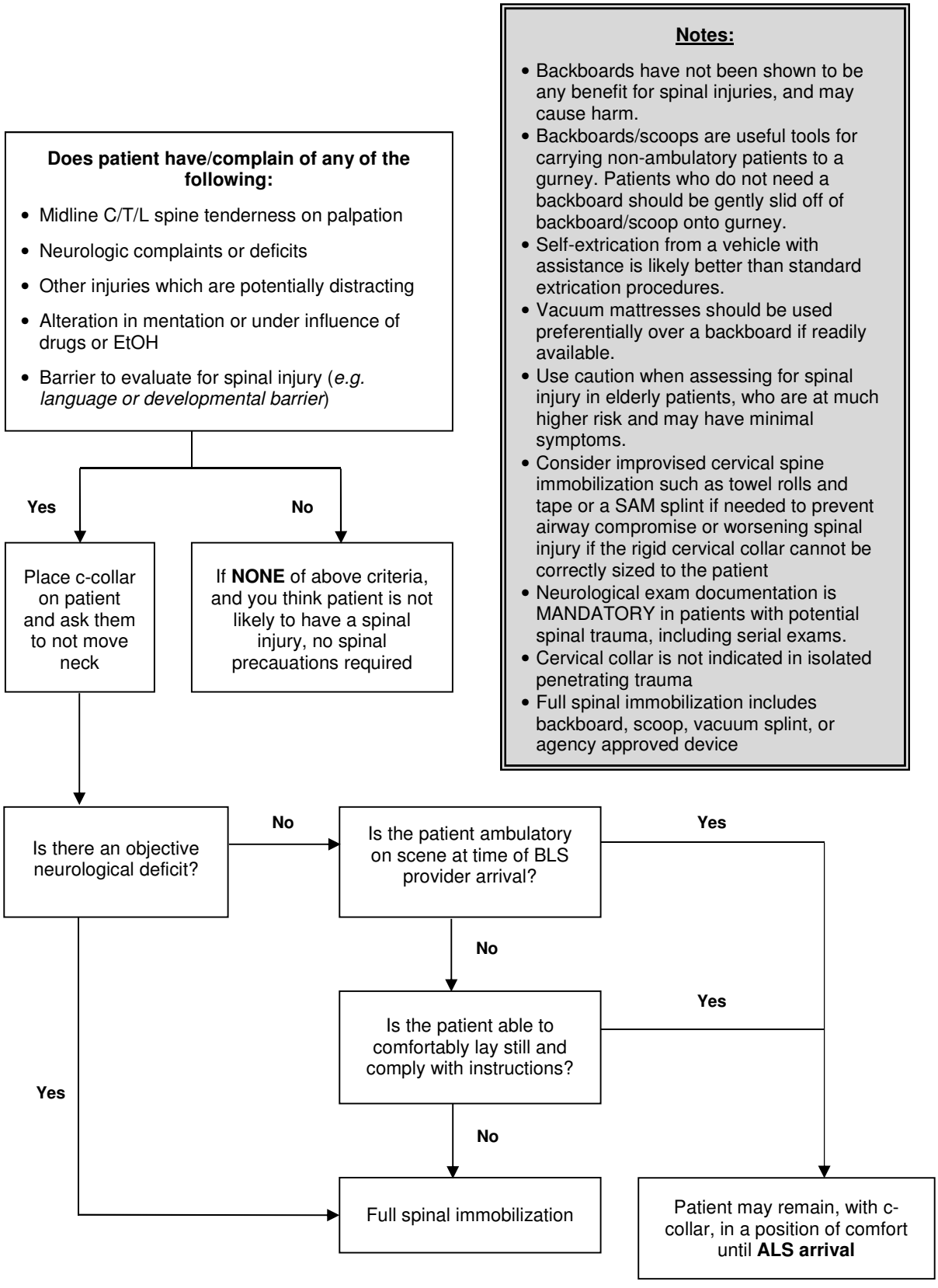
Signs of Spinal Cord Injury:

- Sensory loss, weakness and/or paralysis
- Typically bilateral, but may be asymmetrical
- Sensory changes typically have a level, corresponding to the level of the injury
- Numbness, tingling or painful burning in arms, legs
- **Central cord syndrome** is an incomplete spinal cord injury and causes painful burning or sensory changed in shoulders and upper extremities bilaterally and spares the lower extremities. It may be subtle

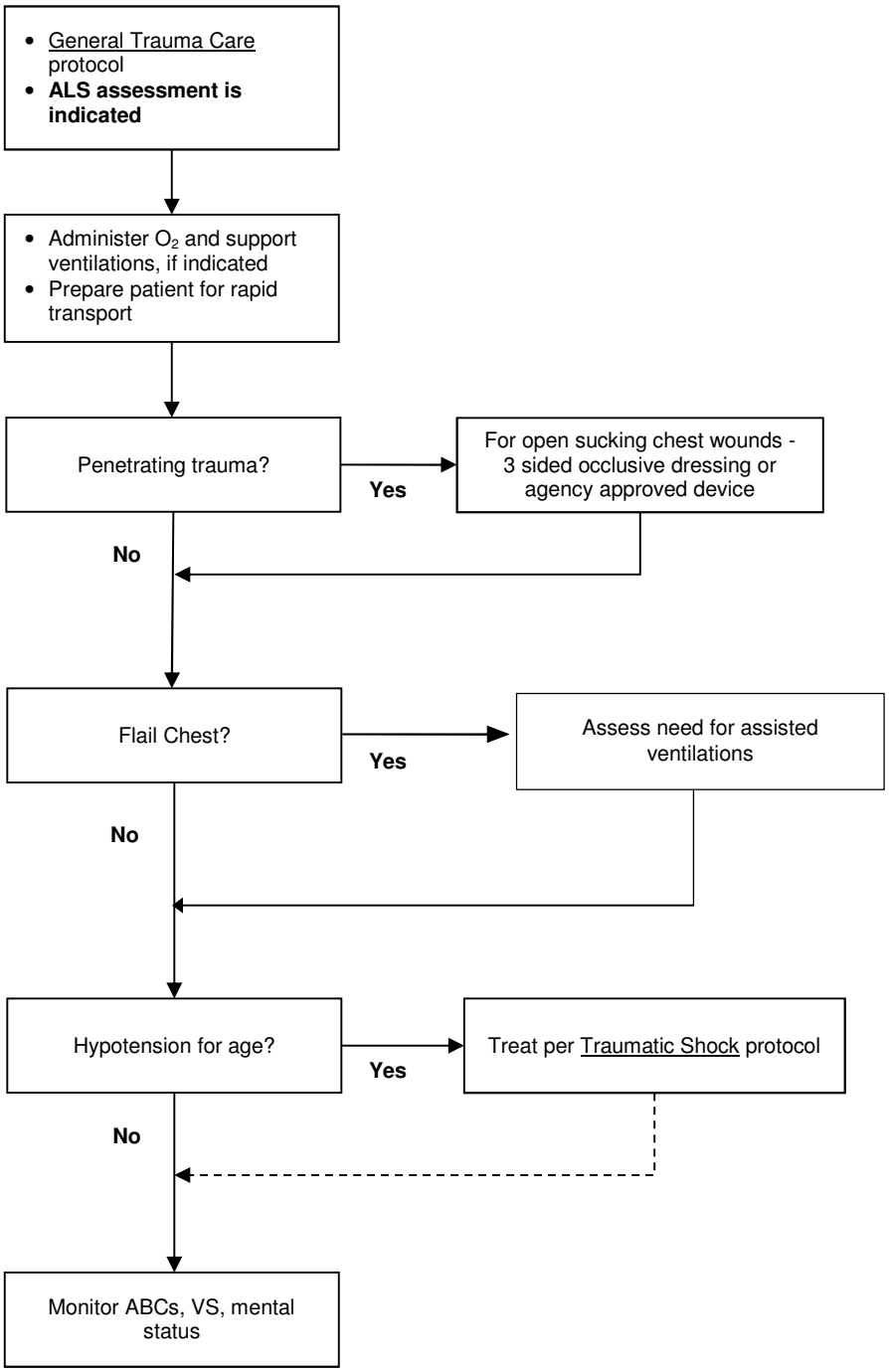
Spinal Immobilization not routinely indicated for penetrating neck injury

Penetrating injury is very rarely associated with unstable spinal column

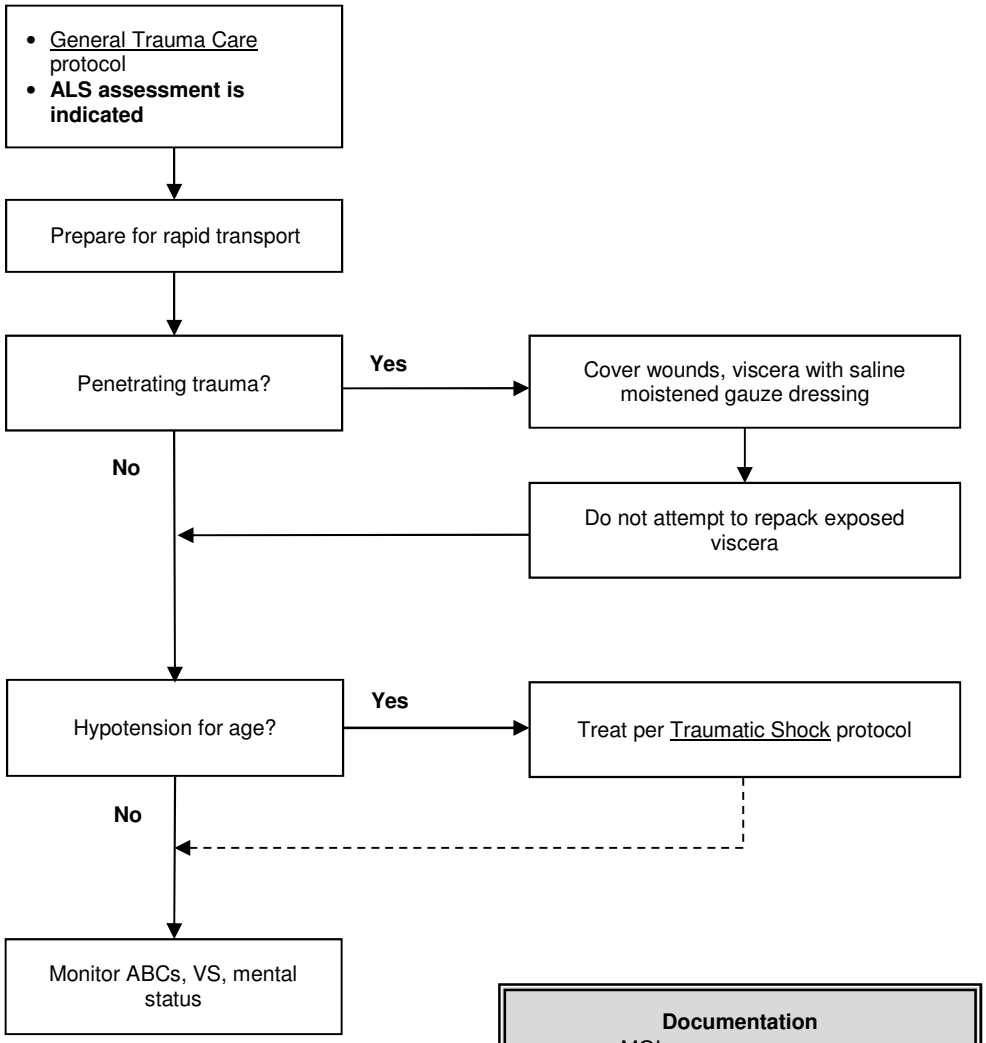
SPINAL PRECAUTIONS PROTOCOL



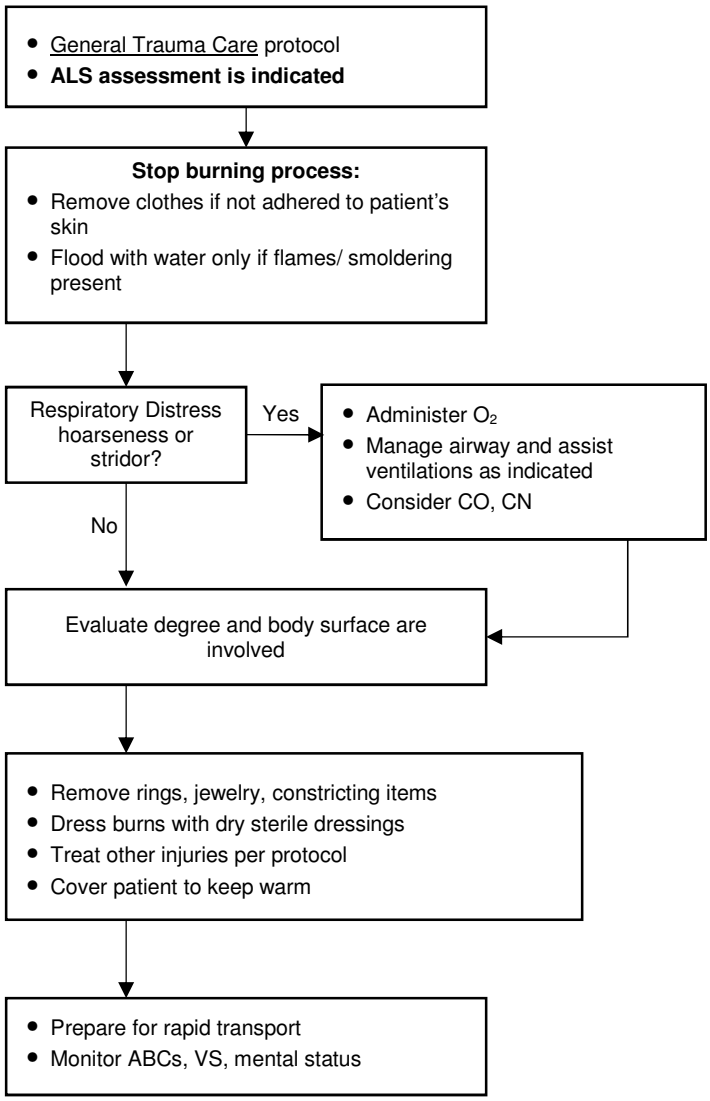
CHEST TRAUMA



ABDOMINAL TRAUMA



BURNS



Document:

- Type and degree of burn(s)
- % BSA
- Respiratory status including any voice changes (hoarseness)
- Singed nares, soot in mouth
- PMHx
- Confined space (assume CO)

Types of Burns:

- Thermal: remove from environment, put out fire
- Chemical: brush off or dilute chemical. Consider HAZMAT
- Electrical: make sure victim is de-energized and suspect internal injuries
- Assume CO if enclosed space
- Consider cyanide poisoning (CN) if unconscious or pulseless arrest

GENERAL GUIDELINES: PEDIATRIC PATIENTS

General Principles:

For the purpose of the protocols, pediatric patients are defined as <14 years of age. The unique anatomy, physiology and developmental needs of children in this age range affect prehospital care. Several specific differences include:

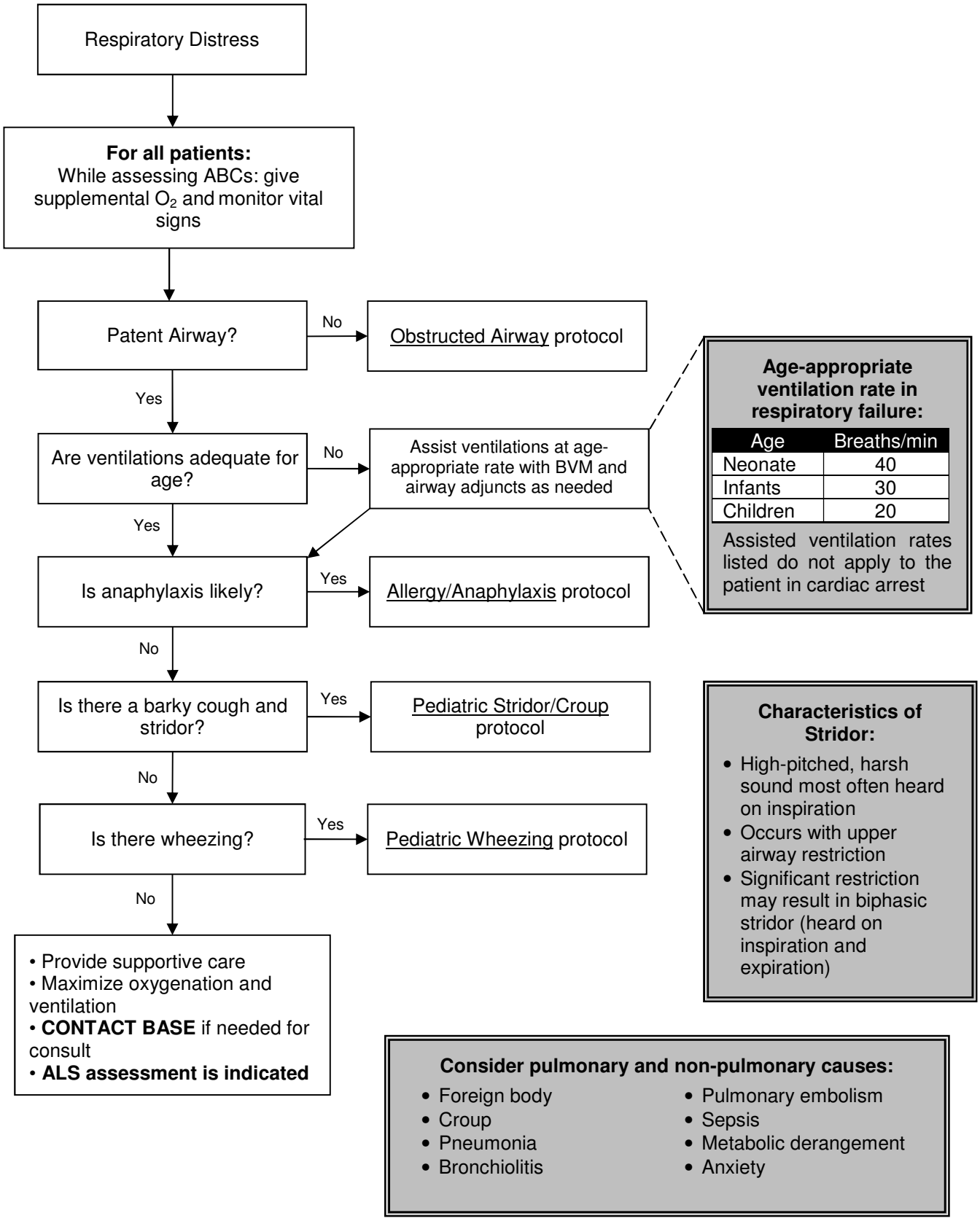
A. Airways are smaller, softer and easier to obstruct or collapse. Actions such as neck hyperflexion, hyperextension, or cricoid pressure may create an upper airway obstruction in a child.
B. Respiratory reserves are small, resulting in the possibility of rapid desaturation in the setting of increased demand. One of the earliest signs of physiologic stress in a child may be an unexplained increase in respiratory rate.
C. Infants and young children utilize their abdominal musculature to assist with respirations. Tight, abdominally-placed straps used to secure children may result in onset of or worsening respiratory distress.
D. Circulatory reserves are small. The loss of as little as one unit of blood can produce severe shock in an infant.
E. The developmental stage of a child impacts his/her ability to cooperate. The perception and memory of pain is escalated by anxiety. Discuss or forewarn what will be done with any child over 2 years of age. Infants, especially those under 6 months of age, tolerate painful procedures better if allowed to suck on a pacifier during the procedure. Utilize the parent or familiar guardian whenever possible to distract/comfort (tell a story, sing a song, etc.) for all pediatric patients during painful procedures.

Children with special health care needs:

Treat the child, not the equipment. Starting with the ABCs still applies to medically complicated or medical technology-assisted children.

A. The parent/guardian of a special needs child is the expert on that child and knows the details of that illness, typical responses, and baseline interactions better than anyone. Utilize and trust his/her knowledge and concerns. This may include vital signs, medication responses, or physical positioning (i.e. of contracted limbs) that may not be typical.
B. Medically complicated children are often given healthcare notes describing their unique medical history and emergency healthcare needs. Ask the parent/guardian for an emergency information sheet, emergency healthcare form, or QR code.
C. Ask the parent/guardian for the “go bag” for medical technology-assisted children. This will contain the child’s spare equipment and supplies that may be needed on scene, during transport or in the hospital

PEDIATRIC UNIVERSAL RESPIRATORY DISTRESS



PEDIATRIC WHEEZING

- Pediatric Universal Respiratory Distress protocol
- Assess: RR, lung sounds, accessory muscle use and mental status
- Administer O_2

Consider the cause of wheezing before initiating specific therapy

Initial best indicator is age. If patient ≤ 2 years old, bronchiolitis is most likely. Age > 2 reactive airways disease is more likely.

Although bronchiolitis and asthma are the most common causes of wheezing in infants and children, respectively, you should consider pulmonary and non-pulmonary causes of respiratory distress, especially if patient not responding as expected to treatment:

Examples: pneumonia, pulmonary edema, congenital heart disease, anaphylaxis, pneumothorax, sepsis, metabolic acidosis (e.g.: DKA, toxic ingestion), foreign body aspiration, and croup.

Age ≤ 2 years old

Bronchiolitis most common

- Viral illness characterized by fever, copious secretions and respiratory distress typically seen November through April
- Most important interventions are to provide supplemental oxygen and suction secretions adequately
- Bronchodilators and steroids do not work

- Nasal suction
- Place in position of comfort
- Monitor RR, retractions, mental status

If worsening respiratory distress despite above therapies, re-suction nostrils and assist ventilations with BVM

ALS assessment is indicated

Age > 2 years old

Asthma most common

Presentation suggests asthma: *wheezing, prolonged expiratory phase, decreased breath sounds, accessory muscle use, known hx of asthma or albuterol use*

EMT may administer either MDI or nebulized albuterol with **base contact** for verbal order

Is response to treatment adequate

Yes

No

- Assess for pneumothorax
- Assist ventilations with BVM

- Continue monitoring and assessment en route
- Be prepared to assist ventilations as needed
- **Contact Base** for medical consult if patient deteriorates
- **ALS assessment is indicated**

PEDIATRIC STRIDOR/CROUP

Characteristics of Croup:

- Most common cause of stridor in children
- Child will have stridor, barky cough, and URI symptoms of sudden, often nocturnal onset
- Most often seen in children < 9 years old
- Agitation worsens the stridor and respiratory distress

Pediatric Universal Respiratory Distress protocol and prepare for immediate transport

↓

Minimize agitation:
Place in position of comfort, interventions only as necessary

↓

Administer O_2

↓

Are symptoms severe and croup most likely?

- Stridor at rest or biphasic stridor
- Severe retractions
- Altered LOC
- Cyanosis

No → ↓

Yes

↓

If signs of poor perfusion AND/OR hypotension for age, see Medical Shock protocol

↓

- Continue monitoring and assessment
- **Contact Base** for medical consult as needed
- **ALS assessment is indicated**

Considerations with Stridor:

- Stridor is a harsh, usually inspiratory sound caused by narrowing or obstruction of the upper airway
- Causes include croup, foreign body aspiration, allergic reactions, trauma, infection, mass
- Epiglottitis is exceedingly rare. May consider in the unimmunized child. Treatment is minimization of agitation. Airway manipulation is best done in the hospital.

PEDIATRIC BRIEF RESOLVED UNEXPLAINED EVENTS (BRUE) (FORMERLY ALTE)

DEFINITION:
An infant < 1 year of age with episode frightening to the observer characterized by apnea, choking/gagging, color change or change in muscle tone

↓

Support ABCs as necessary

↓

Obtain detailed history of event and medical history

↓

Complete head-to-toe assessment

↓

- Any child with an BRUE should receive an **ALS assessment**
- Monitor vital signs

Clinical history to obtain from observer of event:

- Document **observer's** impression of the infant's color, respirations and muscle tone
- For example, was the child apneic, or cyanotic or limp during event?
- Was there seizure-like activity noted?
- Was any resuscitation attempted or required, or did event resolve spontaneously?
- How long did the event last?

Past Medical History:

- Recent trauma, infection (e.g. fever, cough)
- History of GERD
- History of Congenital Heart Disease
- History of Seizures
- Medication history

Examination/Assessment

- Head to toe exam for trauma, bruising, or skin lesions
- Check anterior fontanelle: is it bulging, flat or sunken?
- Pupillary exam
- Respiratory exam for rate, pattern, work of breathing and lung sounds
- Cardiovascular exam for murmurs and symmetry of brachial and femoral pulses
- Neuro exam for level of consciousness, responsiveness and any focal weakness

CHILDBIRTH PROTOCOL

Overview:

- BLS providers called to a possible prehospital childbirth should determine if delivery is imminent
- If imminent, immediately prepare to assist with the delivery
- If no signs of imminent delivery, prepare patient for transport

- Support ABCs
- Administer O_2
- **ALS assessment is indicated**

Obtain obstetrical history (see adjacent)

Specific Information Needed:

- Obstetrical history:
  - Number of pregnancies (GRAVIDA)
  - Live births (PARA)
  - Expected delivery date
  - Length of previous labors
  - Narcotic use in past 4 hours

If suspected imminent childbirth:

- Allow patient to remain in position of comfort
- Visualize perineum
- Determine if delivery is imminent

Imminent Delivery

Delivery is imminent if there is crowning or bulging of perineum

Delivery not imminent

- Place patient in position of comfort, preferably on left side, while preparing for transport
- Monitor for progression to imminent delivery

Emergency Childbirth Procedure

- If there is a prolapsed umbilical cord or apparent breech presentation, go to obstetrical complications protocol and prepare for immediate transport
- For otherwise uncomplicated delivery:
- Position mother supine on flat surface, if possible
- Do not attempt to impair or delay delivery
- Support and control delivery of head as it emerges
- Protect perineum with gentle hand pressure
- Check for cord around neck, gently remove from around neck, if present
- Suction mouth, then nose of infant as soon as head is delivered
- If delivery not progressing, baby is "stuck", see obstetrical complications protocol and prepare for immediate transport
- As shoulders emerge, gently guide head and neck downward to deliver anterior shoulder. Support and gently lift head and neck to deliver posterior shoulder
- Rest of infant should deliver with passive participation – get a firm hold on baby
- Keep newborn at level of mother's vagina until cord stops pulsating and is double clamped

Critical Thinking:

- Normal pregnancy is accompanied by higher heart rates and lower blood pressures
- Shock will be manifested by signs of poor perfusion
- Labor can take 8-12 hours, but as little as 5 minutes if high PARA
- The higher the PARA, the shorter the labor is likely to be
- High risk factors include: no prenatal care, drug use, teenage pregnancy, DM, htn, cardiac disease, prior breech or C section, preeclampsia, twins
- Note color of amniotic fluid for meconium staining

Postpartum Care Infant

- Suction mouth and nose only if signs of obstruction by secretions
- Respirations should begin within 15 seconds after stimulating reflexes. If not, begin artificial ventilations at 30-40 breaths/min
- If apneic, cyanotic or HR < 100, begin neonatal resuscitation
- Dry baby and wrap in warm blanket
- After umbilical cord stops pulsating, double clamp 6" from infant abdominal wall and cut between clamps with sterile scalpel. If no sterile cutting instrument available, lay infant on mother's abdomen and do not cut clamped cord
- Document 1 and 5 minute APGAR scores

Postpartum Care Mother

- Placenta should deliver in 20-30 minutes. If delivered, collect in plastic bag and bring to hospital. Do not pull cord to facilitate placenta delivery and do not delay transport awaiting placenta delivery
- If the perineum is torn and bleeding, apply direct pressure with sanitary pads
- Postpartum hemorrhage – see obstetrical complications protocol

OBSTETRICAL COMPLICATIONS

For All Patients with obstetrical complications

- **ALS assessment is indicated**
- Do not delay: prepare for immediate transport
- Give high-flow oxygen

Possible actions for specific complications (below)

- The following actions may not be feasible in every case, nor may every obstetrical complication be anticipated or effectively managed in the field. These should be considered "best advice" for rare, difficult scenarios. In every case, prepare for immediate transport and **consult base** for guidance.

Prolapsed Umbilical Cord

- Discourage pushing by mother
- Position mother in Trendelenberg or supine with hips elevated
- Place gloved hand in mother's vagina and elevate the presenting fetal part off of cord until relieved by physician
- Feel for cord pulsations
- Keep exposed cord moist and warm

Breech Delivery

- Never attempt to pull infant from vagina by legs
- IF legs are delivered gently elevate trunk and legs to aid delivery of head
- Head should deliver in 30 seconds. If not, reach 2 fingers into vagina to locate infant's mouth. Press vaginal wall away from baby's mouth to access an airway
- Apply gentle abdominal pressure to uterine fundus
- IF infant delivered see childbirth protocol – Postpartum care of infant and mother

Postpartum Hemorrhage

- Massage abdomen (uterine fundus) until firm
- Prepare for rapid transport
- Note type and amount of bleeding

Complications of Late Pregnancy

3rd Trimester Bleeding (6-8 months)

- High flow O_2 via NRB
- Suspect placental abruption or placenta previa
- Prepare for rapid transport
- Position patient on left side
- Note type and amount of bleeding

Eclampsia/Toxemia

- High flow O_2 via NRB
- SBP > 140, DBP > 90, peripheral edema, headache, seizure
- Place in position of comfort

Shoulder Dystocia

- Support baby's head
- Suction oral and nasal passages
- DO NOT pull on head
- May facilitate delivery by placing mother with buttocks just off the end of bed, flex her thighs upward and gentle open hand pressure above the pubic bone
- IF infant delivered see childbirth protocol – Postpartum care of infant and mother

MEDICATIONS

ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

Description

- Albuterol is a selective ß-2 adrenergic receptor agonist. It is a bronchodilator and positive chronotrope.

Onset & Duration

- Onset: 5-15 minutes after inhalation
- Duration: 3-4 hours after inhalation

Indications

- Bronchospasm

Contraindications

- Severe tachycardia is a relative contraindication

Adverse Reactions

- Tachycardia
- Palpitations
- Dysrhythmias

Drug Interactions

- Sympathomimetics may exacerbate adverse cardiovascular effects.
- ß-blockers may antagonize albuterol.

How Supplied

MDI: 90 mcg/metered spray (17-g canister with 200 inhalations)
Pre-diluted nebulized solution: 2.5 mg in 3 ml NS (0.083%)

Dosage and Administration

Adult, Base Contact Required:

Single Neb dose
Albuterol sulfate solution 0.083% (one unit dose bottle of 3.0 ml), by nebulizer, at a flow rate (6-8 lpm) that will deliver the solution over 5 to 15 minutes. May be repeated twice (total of 3 doses).

Continuous Neb dose
In more severe cases, place 3 premixed containers of albuterol (2.5 mg/3ml) for a total dose of 7.5 mg in 9 ml, into an oxygen-powered nebulizer and run a continuous neb at 6-8 lpm.

Pediatric, Base Contact Required:

Single Neb dose
Albuterol sulfate solution 0.083% (one unit dose bottle of 3.0 ml), by nebulizer, at a flow rate (6-8 lpm) that will deliver the solution over 5 to 15 minutes. May be repeated twice with **Base Contact** between doses (total of 3 doses).

Protocol

- Adult Wheezing
- Pediatric Wheezing
- Allergy and Anaphylaxis

MEDICATIONS

ASPIRIN (ASA)

Description

Aspirin inhibits platelet aggregation and blood clotting and is indicated for treatment of acute coronary syndrome in which platelet aggregation is a major component of the pathophysiology. It is also an analgesic and antipyretic.

Indications

- Suspected acute coronary syndrome

Contraindications

- **Active** gastrointestinal bleeding
- Aspirin allergy

How Supplied

Chewable tablets 81mg

Dosage and Administration

- 324mg PO

Protocol

- Chest Pain

Special Considerations

- Patients with suspected acute coronary syndrome taking warfarin (Coumadin), clopidogrel (Plavix) or novel oral anticoagulants may still be given aspirin.

EPINEPHRINE (ADRENALIN)

Description

Endogenous catecholamine alpha, beta-1, and beta-2 adrenergic receptor agonist. Causes dose-related increase in heart rate, myocardial contractility and oxygen demand, peripheral vasoconstriction and bronchodilation.

Indications

- Systemic Allergic Reaction (Anaphylaxis)

Adverse Reactions

- Tachycardia and tachydysrhythmia
- Hypertension
- Anxiety
- Can precipitate myocardial infarct (MI)

Dosage and Administration

Epinephrine Auto-Injector:

Systemic allergic reaction:

Adult: 0.3 mg IM with patient's prescribed auto-injector (adult EpiPen, Auvi-Q)

Pediatric: 0.15 mg IM with patient's prescribed auto-injector (EpiPen Jr., Auvi-Q)

Protocol

- Allergy and Anaphylaxis Protocol

Special Considerations

- Can increase myocardial oxygen demand and precipitate myocardial infarct (MI). Use with caution in patients with known or suspected heart disease (CAD).

MEDICATIONS

NALOXONE (NARCAN)

Description

Naloxone is a competitive opioid receptor antagonist

Onset & Duration

Onset: Within 5 minutes
Duration: 1-4 hours

Indications

- For reversal of suspected opioid-inducted CNS and respiratory depression
- Coma of unknown origin with impaired airway reflexes or respiratory depression

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Adverse Reactions

- Tachycardia
- Nausea and vomiting
- Pulmonary Edema

Dosage and Administration

Adult:

For severe respiratory compromise or respiratory arrest: Administer 2mg IN via MAD (mucosal atomization device)

With **Base Contact**, repeat dose may be considered if no improvement in respiratory effort after 5 minutes of initial dose. Routine use of high dose Naloxone should be avoided.

Pediatrics:

Supportive care only (oxygenation and ventilation, as needed)

Special Considerations

- For all patients, ensure proper oxygenation and ventilation
- Not intended for use unless respiratory depression or impaired airway reflexes are present. Reversal of suspected mild-moderate opioid toxicity is not indicated in the field as it may greatly complicate treatment and transport as narcotic-dependent patients may experience violent withdrawal symptoms
- If patient does not respond to single dose, investigate other potential causes for respiratory compromise
- Patients receiving naloxone **must** receive **ALS assessment**

MEDICATIONS

NITROGLYCERIN (NITROSTAT, NITROQUICK, etc)

Description

Short-acting peripheral venodilator decreasing cardiac preload and afterload

Onset & Duration

Onset: 1-3 min.
Duration: 20-30 min.

Indications

- Chest pain or discomfort due to suspected Acute Coronary Syndrome
- Patient is prescribed Nitroglycerin, and the Nitroglycerin is available on scene

Contraindications

- Hypotension SBP < 100
- Use of erectile dysfunction (ED) medication (e.g. Viagra, Cialis)

Adverse Reactions

- Hypotension
- Headache
- Syncope

Dosage and Administration

- **Base Contact Required** to assist the patient in self-administration of the patient's prescribed Nitroglycerin
- 0.4 mg sublingually, every 5 minutes PRN up to a total of 3 doses for persistent CP

Special Considerations

- Erectile dysfunction medications are prescribed to men and women for multiple conditions (eg. pulmonary HTN)

ORAL GLUCOSE ADMINISTRATION

Pharmacology and Actions

Glucose is the body's basic fuel and is required of cellular metabolism. A sudden drop in blood sugar level will result in disturbances of normal metabolism, manifested clinically as decrease in mental status, diaphoresis and tachycardia. Further decreases in blood sugar may result in coma, seizures and cardiac arrhythmia. Serum glucose is regulated by insulin, which stimulates the storage of excess glucose from the body's blood stream, and glucagon, which mobilizes stored glucose into the blood stream. The oral glucose paste is rapidly absorbed from oral mucosa, thus elevating the body's blood glucose level.

Indications

A. Altered mental status and/ or

B. History of diabetes, and

C. Ability to swallow the medication

Precautions

Any patient who is unable to swallow may experience an airway obstruction or aspiration due to the gel.

Administration

A. The dosage of oral glucose is one full tube.

B. Squeeze a small portion of the tube into the patient's mouth between the cheek and gum. Repeat procedure until one full tube of glucose has been administered.

C. Reassess vital signs and the patient's condition.

Side Effects and Special Notes

A. There are no specific side effects if administered properly.

B. Due to the gel thickness, this is a potential for airway obstruction or aspiration if the patient has no gag reflex.

C. It is best to have suction available for administering oral glucose.

OXYGEN

Description

Oxygen added to inspired air increases the amount of oxygen in the blood, and thereby increases the amount delivered to the tissue. Tissue hypoxia causes cell damage and death. Breathing, in most people, is regulated by small changes in the acid-base balance and CO_2 levels. It takes relatively large decreases in oxygen concentration to stimulate respiration.

Indications

- Suspected hypoxemia or respiratory distress from any cause
- Acute chest or abdominal pain
- Hypotension/shock states from any cause
- Trauma
- Suspected carbon monoxide poisoning
- Obstetrical complications, childbirth

Precautions

- If the patient is not breathing adequately, the treatment of choice is assisted ventilation, not just oxygen.
- When pulse oximetry is available, titrate SpO_2 to ≥ 90%. This may take some time.
- Do not withhold oxygen from a COPD patient out of concerns for loss of hypoxic respiratory drive.
  This is never a concern in the prehospital setting with short transport times

Administration

Flow	LPM Dosage	Indications
Low Flow	1-2 LPM	Minor medical / trauma
Moderate Flow	3-9 LPM	Moderate medical / trauma
High Flow	10-15 LPM	Severe medical / trauma

Special Notes

- Do not use permanently mounted humidifiers. If the patient warrants humidified oxygen, use a single patient use device.
- Adequate oxygenation is assessed clinically and with the SpO_2 while adequate ventilation is assessed clinically and with $ETCO_2$.

MEDICATIONS

PHENYLEPHRINE (INTRANASAL)

Description

- Phenylephrine is an alpha adrenergic agonist. When administered intranasally, it causes vasoconstriction in the nasal mucosa and subsequently decreased bleeding and nasal decongestion.

Indications

- Nosebleed (epistaxis).

Precautions

- Avoid administration into the eyes, which will dilate pupil.
- Avoid administration in patients with known heart disease (CAD).

Dosage and Administration

- For patients with active nosebleed, first have patient blow nose to expel clots. Then, administer 2 sprays into affected naris(es).

Protocol

- Epistaxis

MEDICATIONS

ANTIEMETICS: ONDANSETRON (ZOFRAN)

Description

- Ondansetron is a selective serotonin 5-HT3 receptor antagonist antiemetic. Ondansetron is the preferred antiemetic, if available.

Indications

- Nausea and vomiting

Contraindications

- Ondansetron: No absolute contraindication. Should be used with caution in first trimester of pregnancy and should be reserved for only those patient with severe dehydration and intractable vomiting

Adverse Effects:

- Ondansetron: Very low rate of adverse effects, very well tolerated.

Dosage and Administration

Ondansetron

Adult:

4 mg ODT may repeat x1 after 10 minutes, if needed

Pediatric >6 months old and < 4 years old:

2 mg ODT, Contact Base for repeat doses

Pediatric ≥ 4 years old:

4 mg ODT, Contact Base for repeat doses

Protocol

- Abdominal Pain/Vomiting