



Rowan County Emergency Services

EMS Division

EMS System Protocols

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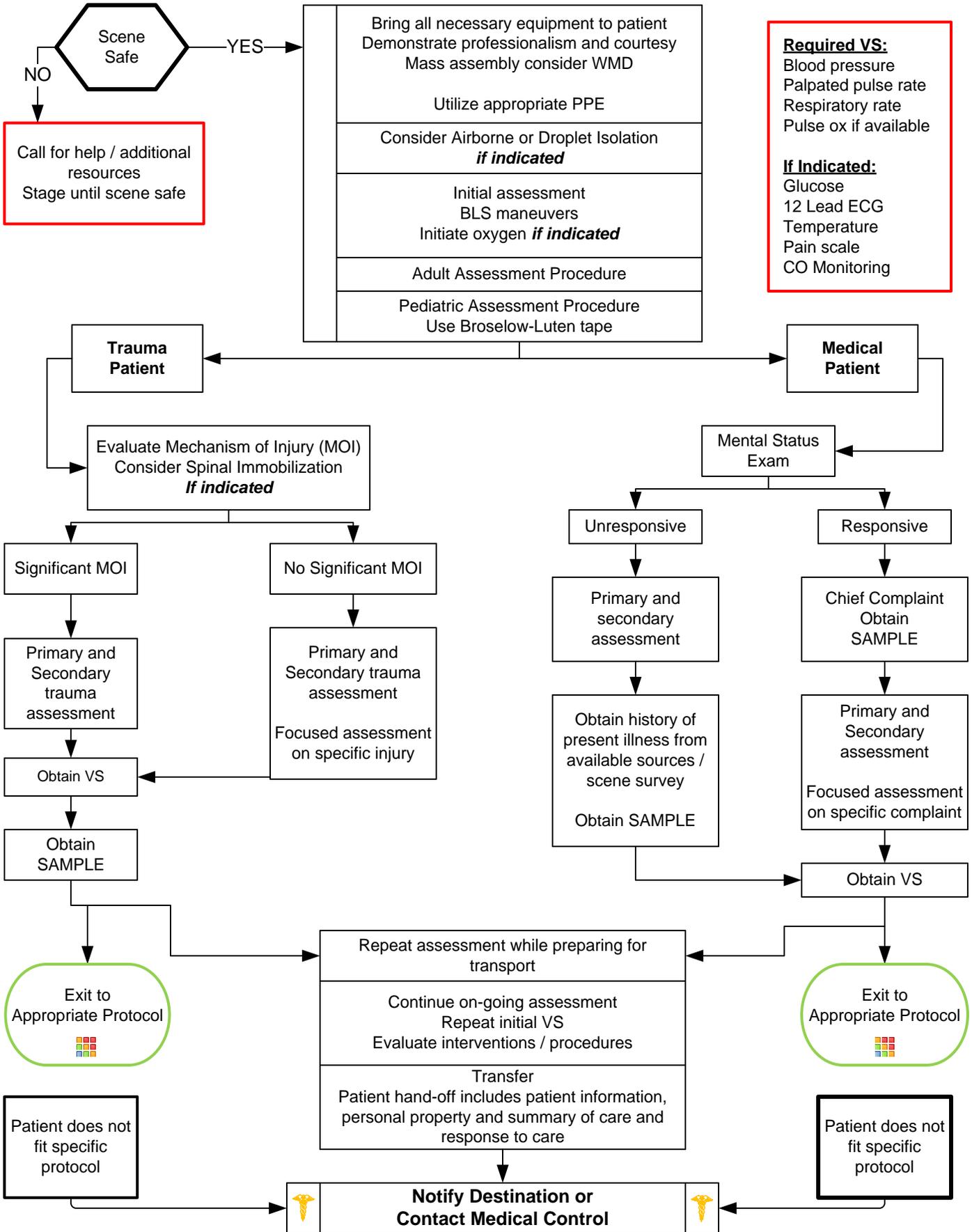
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Universal Patient Care



Pearls

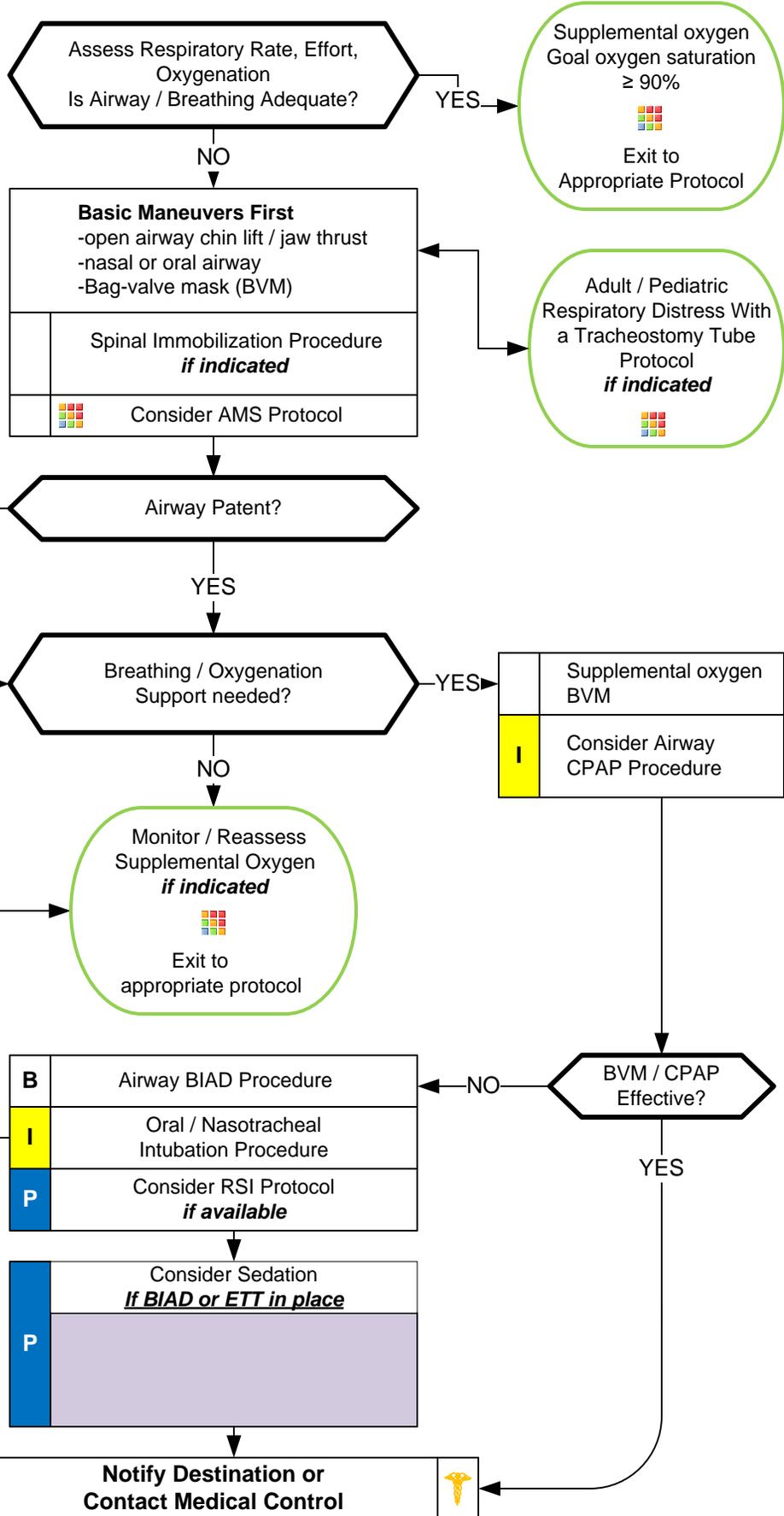
- **Recommended Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status with GCS, and location of injury or complaint.**
- Any patient contact which does not result in an EMS transport must have a completed disposition form.
- A pediatric patient is defined by fitting on the Broselow-Luten tape, Age ≤ 15 , weight ≤ 49 kg.
- Pediatric Airway Protocols are defined by patients ≤ 11 years of age.
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Never hesitate to contact medical control for patient who refuses transport.
- Blood Pressure is defined as a Systolic / Diastolic reading. A palpated Systolic reading may be necessary at times.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading to illness / injury



Adult Airway



Protocols 1, 2 and 3 should be utilized together (even if agency is not using RSI) as they contain very useful information for airway management.



Adult General Section Protocols

Unable to Ventilate and Oxygenate $\geq 90\%$ during or after one (1) or more unsuccessful intubation attempts .
Anatomy inconsistent with continued attempts.
Three (3) unsuccessful attempts by most experienced EMT-P/I.

Exit to Adult Failed Airway Protocol

Notify Destination or Contact Medical Control



Adult Airway



Pearls

- **This protocol is only for use in patients with an Age \geq 12 or patients longer than the Broselow-Luten Tape.**
- **Capnometry (Color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography (EtCO₂) is strongly recommended for the monitoring of all patients with a BIAD or endotracheal tube.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of \geq 90%, it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An Intubation Attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Ventilatory rate should be 8-10 per minute to maintain a EtCO₂ of 35-45. Avoid hyperventilation.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- Intermediates and Paramedics should use a BIAD if oral-tracheal intubation is unsuccessful.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic – use oxygen, not a paper bag.
- Cricoid pressure and BURP maneuver may be used to assist with difficult intubations. They may worsen view in some cases.
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO₂ of 30-35.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well and consider c-collar (in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.



Adult, Failed Airway



Unable to Ventilate and Oxygenate $\geq 90\%$ during or after one (1) or more unsuccessful intubation attempts .

Anatomy inconsistent with continued attempts.

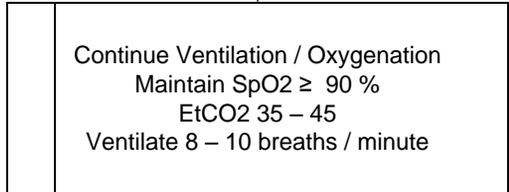
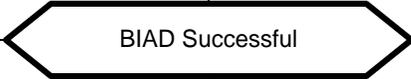
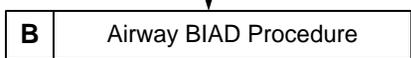
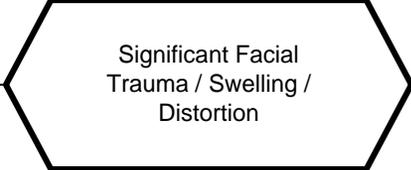
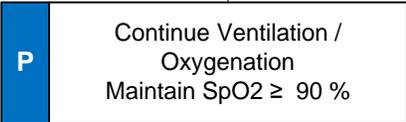
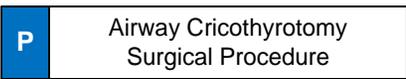
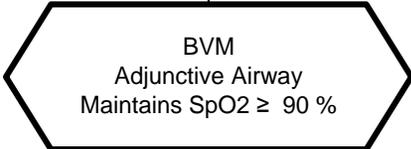
Three (3) unsuccessful attempts by most experienced EMT-P/I.

Each attempt should include change in approach or equipment

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Protocols 1, 2 and 3 should be utilized together (even if agency is not using RSI) as they contain very useful information for airway management.

Call for additional resources if available



Adult General Section Protocols

Protocol 3



Adult, Failed Airway



Pearls

- **If first intubation attempt fails, make an adjustment and then consider:**
 - Different laryngoscope blade / Video or other optical laryngoscopy devices
 - Gum Elastic Bougie
 - Different ETT size
 - Change cricoid pressure. Cricoid pressure no longer routinely recommended and may worsen view.
 - Apply BURP maneuver (Push trachea Back [posterior], Up, and to patient's Right)
 - Change head positioning
- Continuous pulse oximetry should be utilized in all patients with an inadequate respiratory function.
- Continuous EtCO₂ should be applied to all patients with respiratory failure or to all patients with advanced airways.
- **Notify Medical Control AS EARLY AS POSSIBLE about the patient's difficult / failed airway.**



Airway, Drug Assisted Airway (OPTIONAL)



Indications for Drug Assisted Airway

Failure to protect the airway

Unable to oxygenate

Unable to ventilate

Impending airway compromise

Length > Broselow-Luten Tape

Preoxygenate 100% O ₂	
I	IV Procedure (preferably 2 sites) P IO Procedure
P	Assemble Airway Equipment Suction equipment Alternative Airway Device

Protocols 1, 2 and 3 should be utilized together (even if agency is not using RSI) as they contain very useful information for airway management.

Hexagon: Hypoxia and / or Hypotension / Shock Present Dangerously combative

P	Etomidate 0.3 mg/kg IV / IO Or Ketamine 1.5 - 2 mg/kg IV / IO
	Succinylcholine 1.5 mg / kg IV / IO Or Rocuronium 1 mg kg IV / IO (if Succinylcholine contraindicated)
	Intubate trachea or BIAD
	Placement Verified Continuous Capnography
	Consider Restraints Physical Procedure
P	Consider Gastric Tube Insertion Procedure

P	Ketamine 1.5 - 2 mg/kg IV / IO / IM
	Hypotension/Shock Protocols as indicated

Exit to Airway(s) Protocol as indicated

Hexagon: Awakening or Moving after intubation

P	Morphine 4 mg IV / IO Repeat 2 mg every 5 minutes as needed Maximum 10 mg Or Fentanyl 50 - 75 mcg IV / IO Repeat 25 mcg every 5 minutes Maximum 200 mcg
	Midazolam 2 - 2.5 mg IV / IO Repeat every 3 - 5 minutes as needed Maximum 10 mg
	Consider long term paralytic Vecuronium 10 mg (0.1 mg/kg) IV / IO If needed for patient movement. Ensure patient is adequately sedated first

Paralytics:
Removes protective airway reflexes and ability to ventilate.

YOU are responsible for Oxygenation and Ventilation

Must have two (2) EMT-P on scene

Red Text are the key performance indicators used to evaluate protocol compliance.

An Airway Evaluation Form must be completed on every patient who receives a Drug Assisted Airway.

Notify Destination or Contact Medical Control

Adult General Section Protocols

Protocol 4

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS



Airway, Rapid Sequence Intubation (OPTIONAL)



Most important caveat is determining the patient NOT APPROPRIATE for Rapid Sequence Intubation.

High Risk Patients:

Brain illness or injury; Underlying respiratory disease; Underlying cardiac disease; Aortic disease; Obese patients; Pregnant patients; and Patients age > 55. All pre-hospital Rapid Sequence Intubations are to be considered HIGH RISK.

Patients with anticipated difficult airway who can be managed by basic maneuvers / BVM / CPAP with adequate oxygenation and ventilation may require rapid transport only.

Refer to *Adult Airway*, and *Adult Failed Airway* protocols.

Specifically make sure you assess the difficulty in using a Bag Valve Mask, Laryngoscopy, BIAD, and Cricothyrotomy with each patient.

Preparation:

Assemble and test equipment. Oxygen, BVM, Suction, Laryngoscope, Gum Elastic Bougie, BIAD, Syringes, Medications, AirTraq and Cricothyrotomy device.

Assure large bore IV with 2 sites preferable.

Pre-oxygenate:

Pre-oxygenation should optimally occur during initial assessment.

Provide at least 3 minutes of high flow oxygen before rapid sequence intubation.

CPAP is an effective means to provide adequate pre-oxygenation.

Paralyze and Sedate:

Give Etomidate first then paralytic in rapid succession and via rapid IV push with normal saline flushes of 10 mL.

Once medications are given DO NOT VENTILATE unless patient de-saturates below 92%: Continue high flow oxygen by mask or nasal cannula and maintain jaw thrust to keep airway open. This is **apneic oxygenation** and is very effective in supplying oxygen to the blood stream even without ventilations as long as airway patency is maintained. Maintain until intubation conditions are reached and you begin your intubation attempt. Optimal condition should be reached in about 30 to 60 seconds.

Position:

Align external auditory canal with sternal notch. May need to elevate head / torso (pillows or stretcher) in the obese or pregnant patient. If difficulty is anticipated use your stretcher to place the patient's nose in line with your umbilicus.

Trauma: Utilize in-line cervical stabilization during intubation, BIAD or BVM use. During intubation or BIAD the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.

Place endotracheal tube into trachea:

Cricoid pressure may worsen your view and may increase risk of aspiration in some patients. Use if it improves your view.

Bimanual laryngoscopy: Use your right hand to externally manipulate the thyroid cartilage and / or head to give you the best glottic view.

Confirm placement of endotracheal tube into glottis by: Direct visualization; Chest rise and fall; Increasing oxygen saturation; End tidal CO2 device. Maintain continuous waveform capnometry at all times to assure endotracheal tube does not become dislodged.

Post-intubation management:

Give Versed as needed to maintain sedation maintaining systolic blood pressure greater than 90.

Expect transient hypotension immediately following RSI.

Use Vecuronium only after adequate sedation if excessive patient movement is noted. Repeated doses of paralytics are discouraged.

Protect the airway with a combination of physical restraints, versed and vecuronium as needed.

Intranasal Midazolam Dosing:

Mix 5 mg of Midazolam in 1 mL of NS

0.2 mg/kg IN (If ≥ 26 kg give 5 mg)

Split dose between each nostril

Contact Medical Control for repeat dose

Diazepam Dose:

4 mg IV / IO

Repeat every 2 mg 3 to 5 minutes as needed

Maximum 10 mg

Pearls

- Agencies must maintain separate Performance Improvement Program specific to Drug Assisted Airway.
- This protocol requires at least 2 EMT-Paramedics. Perform neurological exam to screen for contraindications.
- Continuous Waveform Capnography and Pulse Oximetry required for endotracheal intubation verification and ongoing monitoring. (This is not validated and may prove impossible in neonatal population, verification by 2 other means is recommended.)
- This protocol is only for use in patients with patients longer than the Broselow-Luten Tape. Drug Assisted Airway is allowed in patients who fit on the Broselow-Luten Tape with DIRECT, ONLINE MEDICAL ORDER. System Medical Director or Assisted Medical Director(s) must give this direct, online medical order only.
- Agencies utilizing Ketamine must submit a local systems plan to State Medical Director detailing how the drug is used in your program. Ketamine can be used with or without a paralytic to in conjunction with endotracheal intubation or BIAD. Ketamine can be used to facilitate resuscitation during airway management. Ketamine use in dangerously agitated patient can be given IM but IV / IO access should be established as soon as possible.
- Drug Assisted Airway medications can be repeated for a second attempt only.
- Paralytics can be dangerous if given when oxygen saturations are < 90%.
- If First intubation attempt fails, make an adjustment and try again:
 - Different laryngoscope blade
 - Change cricoid pressure; No longer routinely recommended and may worsen your view.
 - Different ETT size
 - Continuous pulse oximetry should be utilized in all patients.
 - Change head positioning
 - Consider applying BURP maneuver (Back [posterior], Up, and to patient's Right)
- Protect the patient from self-extubation when the drugs wear off. Longer acting paralytics may be needed post-intubation.

Protocol 4

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Back Pain



History

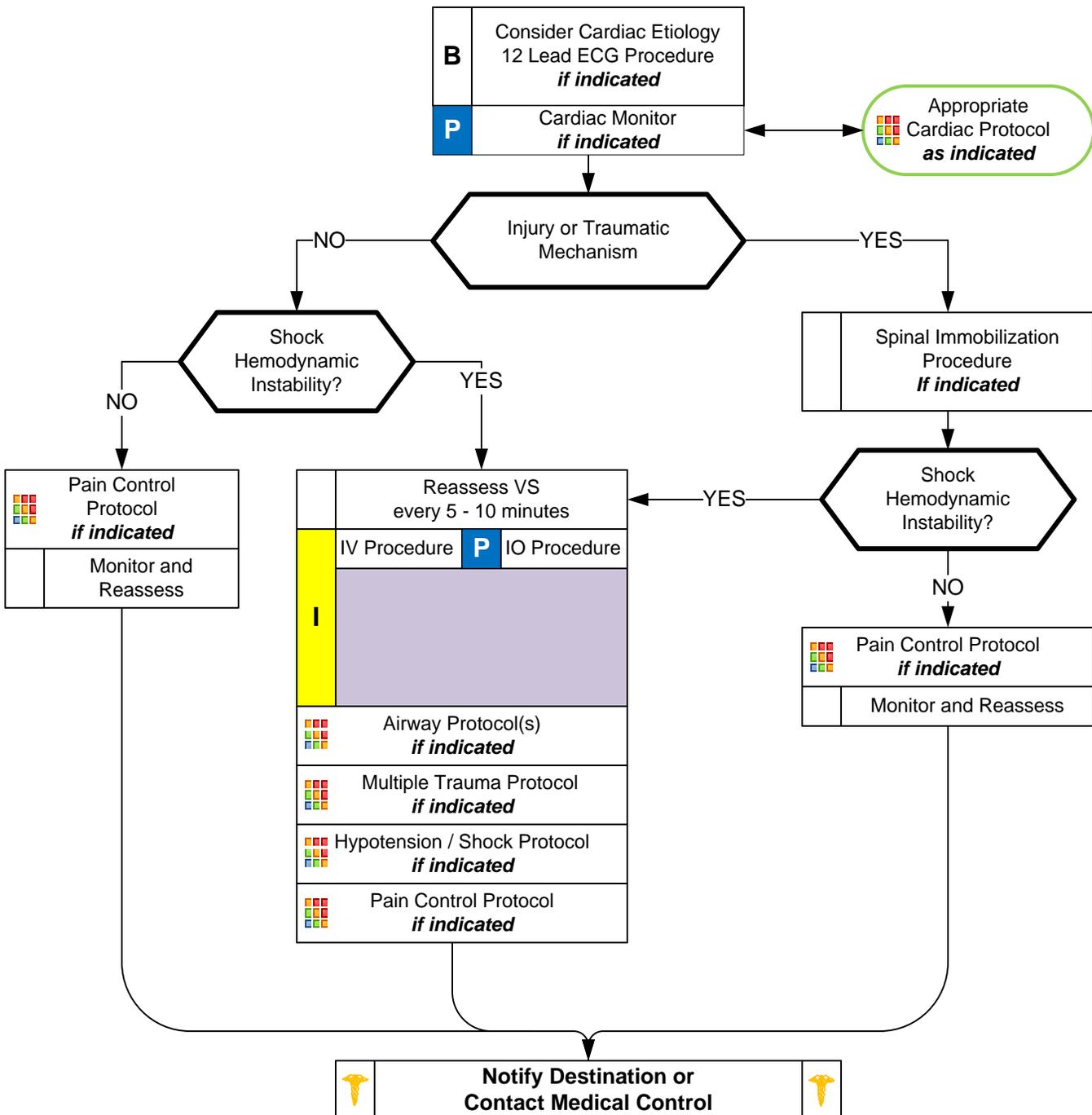
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain / injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Improvement or worsening with activity

Signs and Symptoms

- Pain (paraspinous, spinous process)
- Swelling
- Pain with range of motion
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel / bladder dysfunction

Differential

- Muscle spasm / strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis
- Aneurysm
- Pneumonia
- Spinal Epidural Abscess
- Metastatic Cancer
- AAA





Back Pain



Pearls

- Patients with underlying spinal deformity should be immobilized in their functional position.
- Abdominal aneurysms are a concern especially in patients over the age of 50 and / or with vascular or hypertensive disease.
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.
- Patients with midline pain over the spinous processes should be spinally immobilized.
- Any bowel or bladder incontinence is a significant finding which requires immediate medical evaluation
- In patient with history of IV drug abuse a spinal epidural abscess should be considered.

Protocol 5

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Behavioral

History

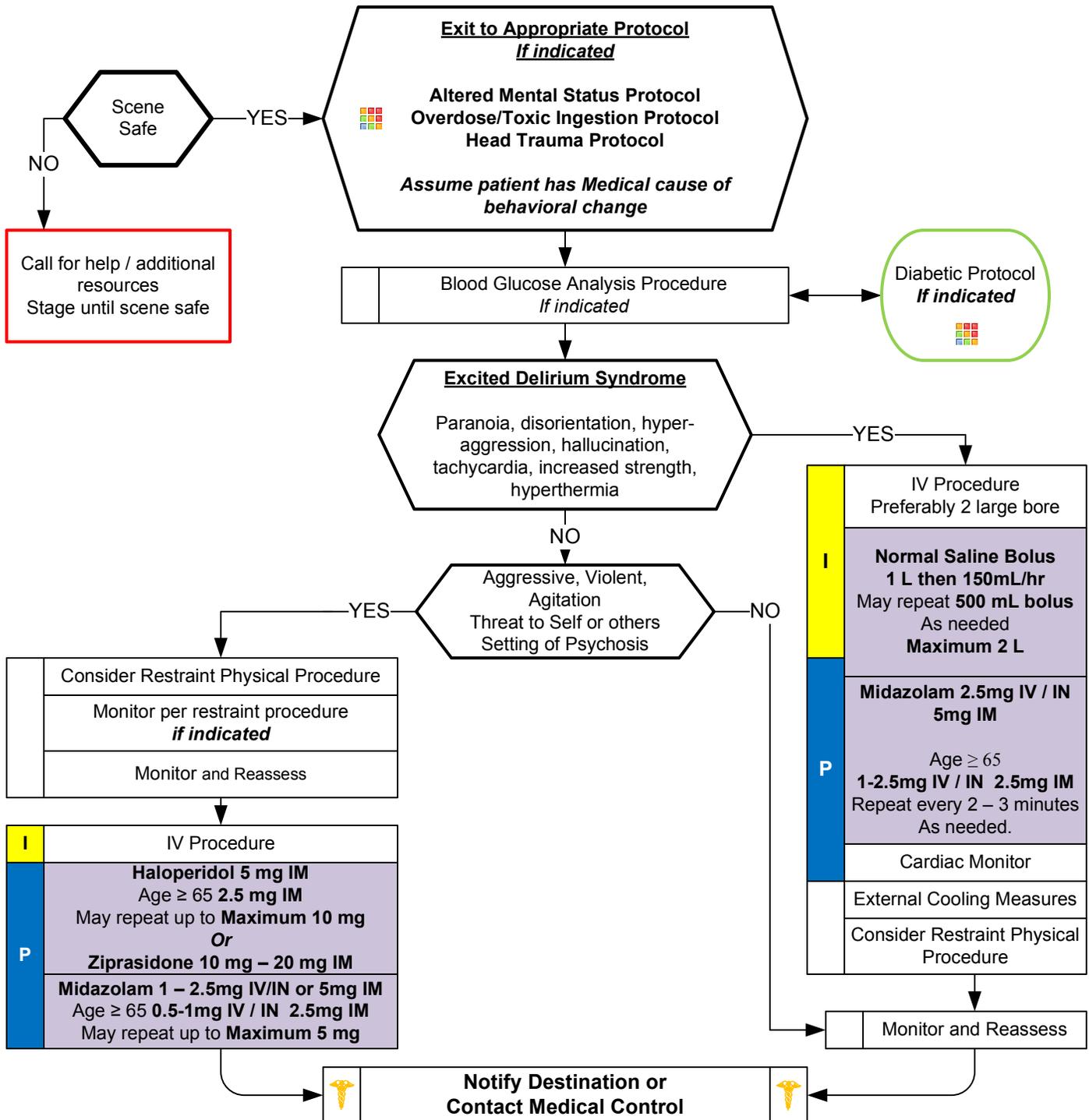
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse / overdose
- Diabetes

Signs and Symptoms

- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts

Differential

- Altered Mental Status differential
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders



Behavioral

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro**
- **Crew / responders safety is the main priority.**
- **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If patient is suspected of agitated delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status.
- **Excited Delirium Syndrome:**
Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
- **Extrapyramidal reactions:**
Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements. Typically an adverse reaction to antipsychotic drugs like Haloperidol and may occur with your administration. When recognized give **Diphenhydramine 50 mg IV / IO / IM / PO** in adults or **1 mg/kg IV / IO / IM / PO** in pediatrics.

Pain Control: Adult

History

- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms

- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

Differential

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

Enter from
Protocol based on **Specific Complaint**



Assess Pain Severity
Use combination of Pain
Scale, Circumstances, MOI,
Injury or Illness severity

Mild

Moderate to Severe

B	Ibuprofen 10mg/kg PO (400 – 800 mg typical adult)
	Acetaminophen 15 mg/kg PO (500 – 1000 mg typical adult) Or Aspirin 324 – 650 mg PO (Adults only)
I	Consider IV Procedure
	Monitor and Reassess

I	IV Procedure	P	IO Procedure
	Ketorolac 30 mg IV / IO 60 mg IM		

P	Cardiac Monitor
	Morphine 4mg IV / IO Repeat 2 mg every 5 min as needed Maximum 20 mg
	Or Fentanyl 50-75 mcg IM/IV/IO/IN Repeat 25 mcg IN/IM/IV/IO every 20 min Maximum of 500 mcg
	Or Hydromorphone 1 – 2 mg
	Monitor and Reassess Every 10 minutes following sedative



**Notify Destination or
Contact Medical Control**



Pain Control: Adult

Pain (definition) – An unpleasant sensory and emotional experience; Associated with actual or potential tissue damage or described in terms of such damage.

Pain is personal and is a subjective experience; it can only be described by the person experiencing the pain; Pain exists whenever the person says it does.

Narcotics are safe in reasonable doses for short periods of time.

When in doubt, treat the pain. Do not withhold analgesia from a patient with legitimate pain.

If the patient has a mental illness, and previous or current addiction to narcotics, administer analgesic and notify receiving facility staff.

Patients that may have an addiction to narcotic analgesics may be experiencing pain. There is a system to help them, please notify the receiving facility for appropriate referrals.

Pain management with analgesics, and nausea management may need to be done together. Nausea is often a side effect of narcotic analgesia administration.

Narcotic analgesic administration may cause respiratory depression. Continuous monitoring of pulse oximeter, and end-tidal carbon dioxide should be done with patients that become obtunded following narcotic analgesic administration.

Should the patient become obtunded following narcotic analgesic administration, narcan may be administered to improve respirations. Continue monitoring the respiratory status because the half-life of narcan is shorter than narcotic medications.

Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO or IM medication delivery and at patient hand off. Monitor BP closely as sedative and pain control agents may cause hypotension.**
- **Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.**
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction in the event no transport occurs.
- Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities, headaches, or abdominal pain.
- **Ketorolac (Toradol) and Ibuprofen should not be used in patients with known renal disease or renal transplant, in patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications), with active bleeding, headaches, abdominal pain, stomach ulcers or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- Do not administer **Acetaminophen** to patients with a history of liver disease.
- Burn patients may require higher than usual opioid doses to effect adequate pain control

Protocol 7

This protocol has been altered from the original 2012 NCEP Protocol by the local EMS Medical Director

Scene Rehabilitation: General

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.



Initial Process

1. Personnel logged into General Rehabilitation Section
2. VS Assessed / Recorded (If HR > 110 then obtain Temp)
3. Personnel assessed for signs / symptoms
4. Remove PPE, Body Armor, Haz-Mat Suits, Turnout Gear, Other equipment as indicated

Significant Injury
Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Diastolic Blood Pressure ≤ 80

Exit to Scene Rehabilitation Responder Protocol



NO

Heat or Cold stress

HEAT STRESS

Active Cooling Measures

Forearm immersion, cool shirts, cool mist fans etc.
10 – 20 Minutes

COLD STRESS

Active Warming Measures

Dry responder, place in warm area
Hot packs to axilla and / or groin

Rehydration Techniques

12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Cooling Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

Rehydration Techniques

12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Warming Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

Reassess responder after 20 Minutes in General Rehabilitation Section
Reassess VS

HR ≥ 110

Temp ≥ 100.6

Responder Cannot Wear Protective Gear

Extend Rehabilitation Time Until VS Improve

NO

NO

Temp ≥ 100.6

HR ≥ 110

Extend Rehabilitation Time Until VS Improve

NO

NO

Discharge Responder from General Rehabilitation Section

Reports for Reassignment

VITAL SIGN CAVEATS

Blood Pressure:

Prone to inaccuracy on scenes. Must be interpreted in context.

Firefighters have elevated blood pressure due to physical exertion and is not typically pathologic.

Firefighters with Systolic BP ≥ 160 or Diastolic BP ≥ 100 may need extended rehabilitation. However this does not necessarily prevent them from returning to duty.

Temperature:

Firefighters may have increased temperature during rehabilitation.

Scene Rehabilitation: General

Pearls

- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.

Protocol 8

This protocol has been altered from the original 2012 NCEP Protocol by the local EMS Medical Director

Scene Rehabilitation: Responder

Remove:

PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment as indicated

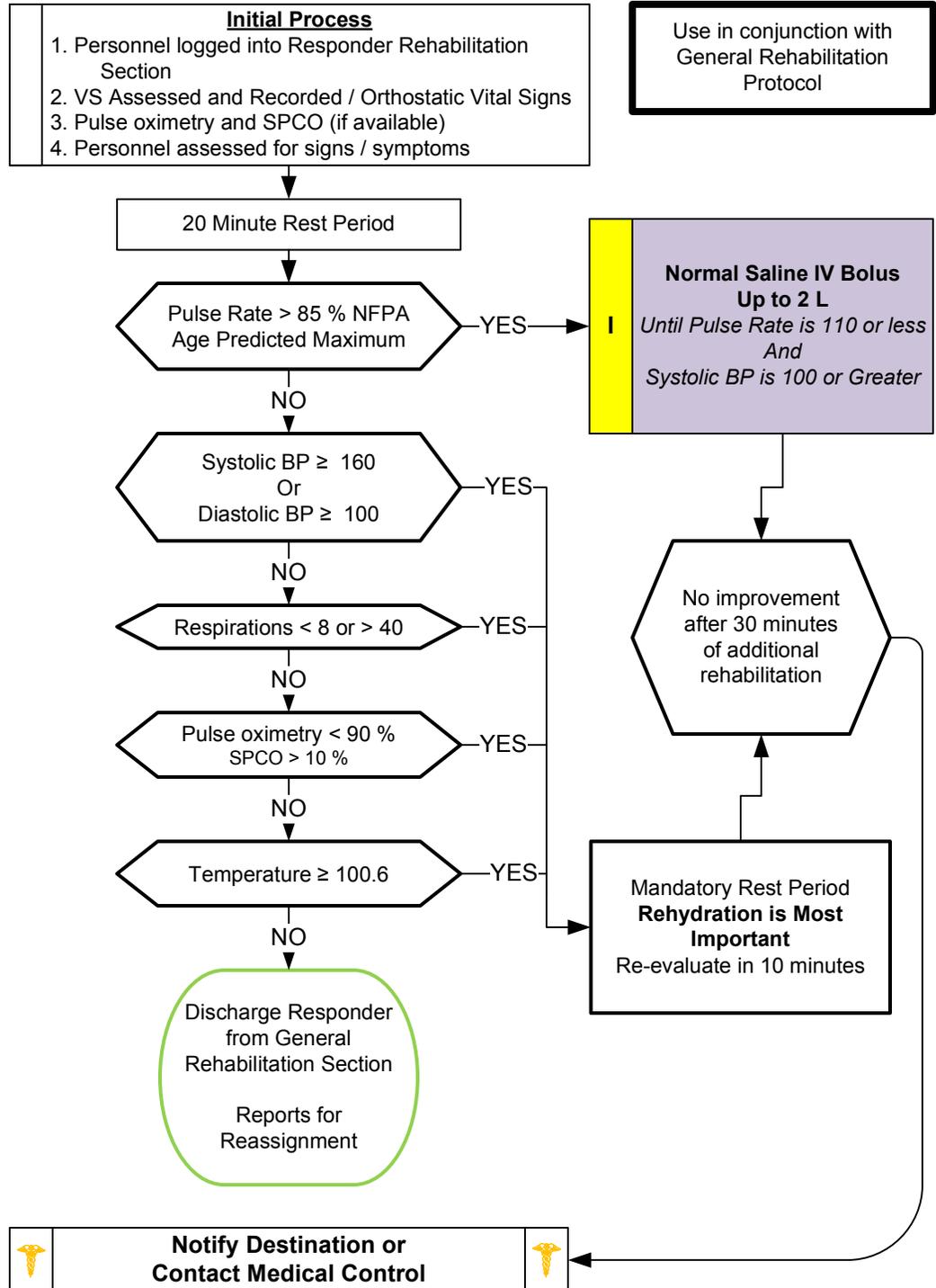
Continue:

Heat and Cold Stress treatment techniques from General Rehab Section

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.



NFPA Age Predicted 85 % Maximum Heart Rate	
20 - 25	170
26 - 30	165
31 - 35	160
36 - 40	155
41 - 45	152
46 - 50	148
51 - 55	140
55 - 60	136
61 - 65	132



Pearls

- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- Utilized when responder is not appropriate for General Rehabilitation Protocol.
- May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.
- Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.

Blank

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Non-Shockable Rhythm (Cardiac Arrest)



History

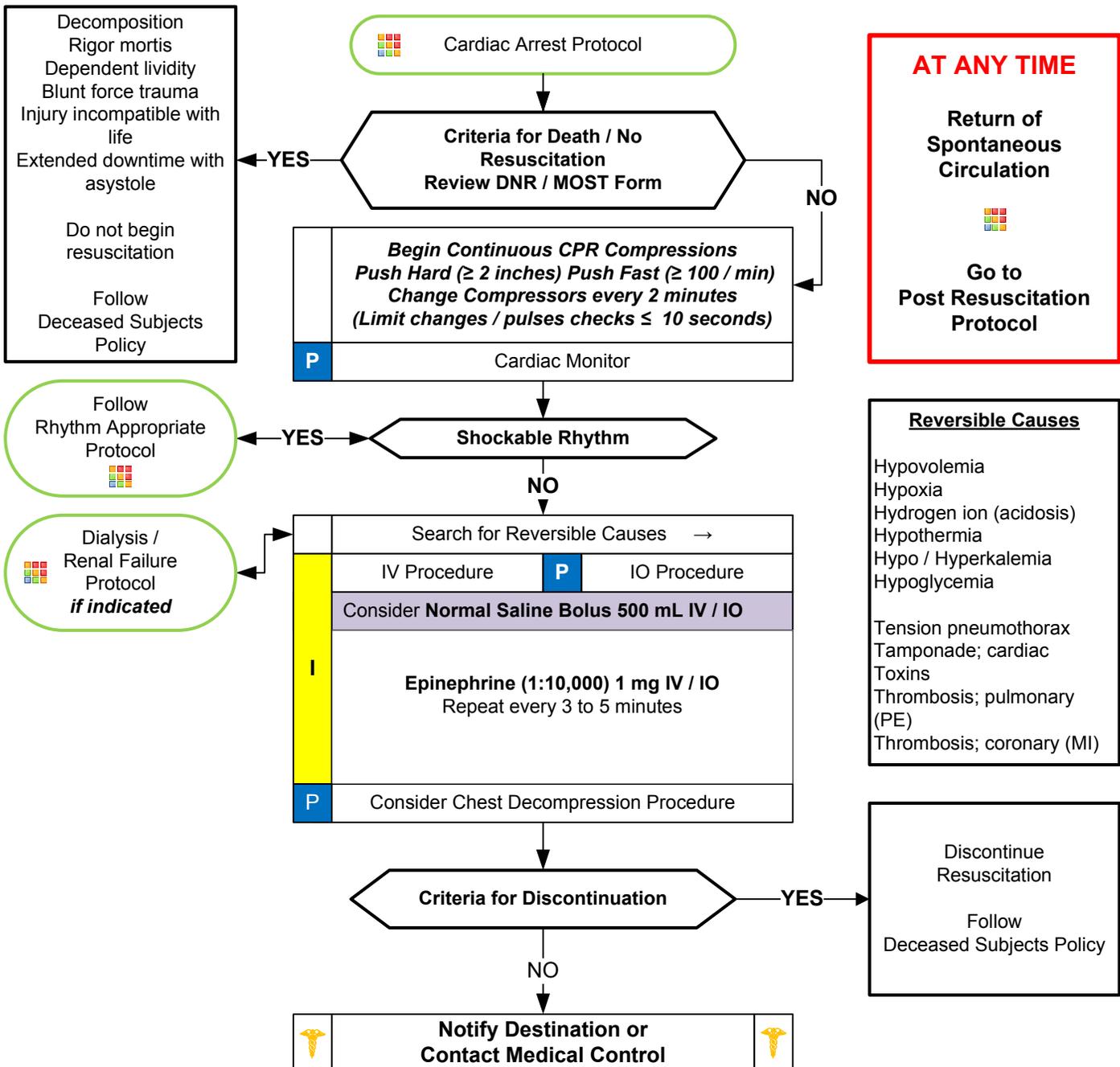
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
 - Tricyclic
 - Digitalis
 - Beta blockers
 - Calcium channel blockers
- DNR, MOST, or Living Will

Signs and Symptoms

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

Differential

- Hypovolemia (Trauma, AAA, other)
- Cardiac tamponade
- Hypothermia
- Drug overdose (Tricyclic, Digitalis, Beta blockers, Calcium channel blockers)
- Massive myocardial infarction
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia



Adult Cardiac Section Protocols

Non- Shockable Rhythm (Cardiac Arrest)



Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Breathing / Airway management after 2 rounds of compressions (2 minutes each round.)**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- If no IV / IO, drugs that can be given down ET tube should have dose doubled and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV/IO is the preferred route when available.
- Consider each possible cause listed in the differential: Survival is based on identifying and correcting the cause.
- Potential association of PEA with hypoxia so placing definitive airway with oxygenation early may provide benefit.
- PEA caused by sepsis or severe volume loss may benefit from higher volume of normal saline administration.
- Return of spontaneous circulation after Asystole / PEA requires continued search for underlying cause of cardiac arrest.
- Treatment of hypoxia and hypotension are important after resuscitation from Asystole / PEA.
- Asystole is commonly an end-stage rhythm following prolonged VF or PEA with a poor prognosis.
- Sodium bicarbonate no longer recommended. Consider in the dialysis / renal patient, known hyperkalemia or tricyclic overdose at 50 mEq total IV / IO.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- Potential protocols used during resuscitation include Overdose / Toxic Ingestion, Diabetic and Dialysis / Renal Failure.



Bradycardia; Pulse Present



History

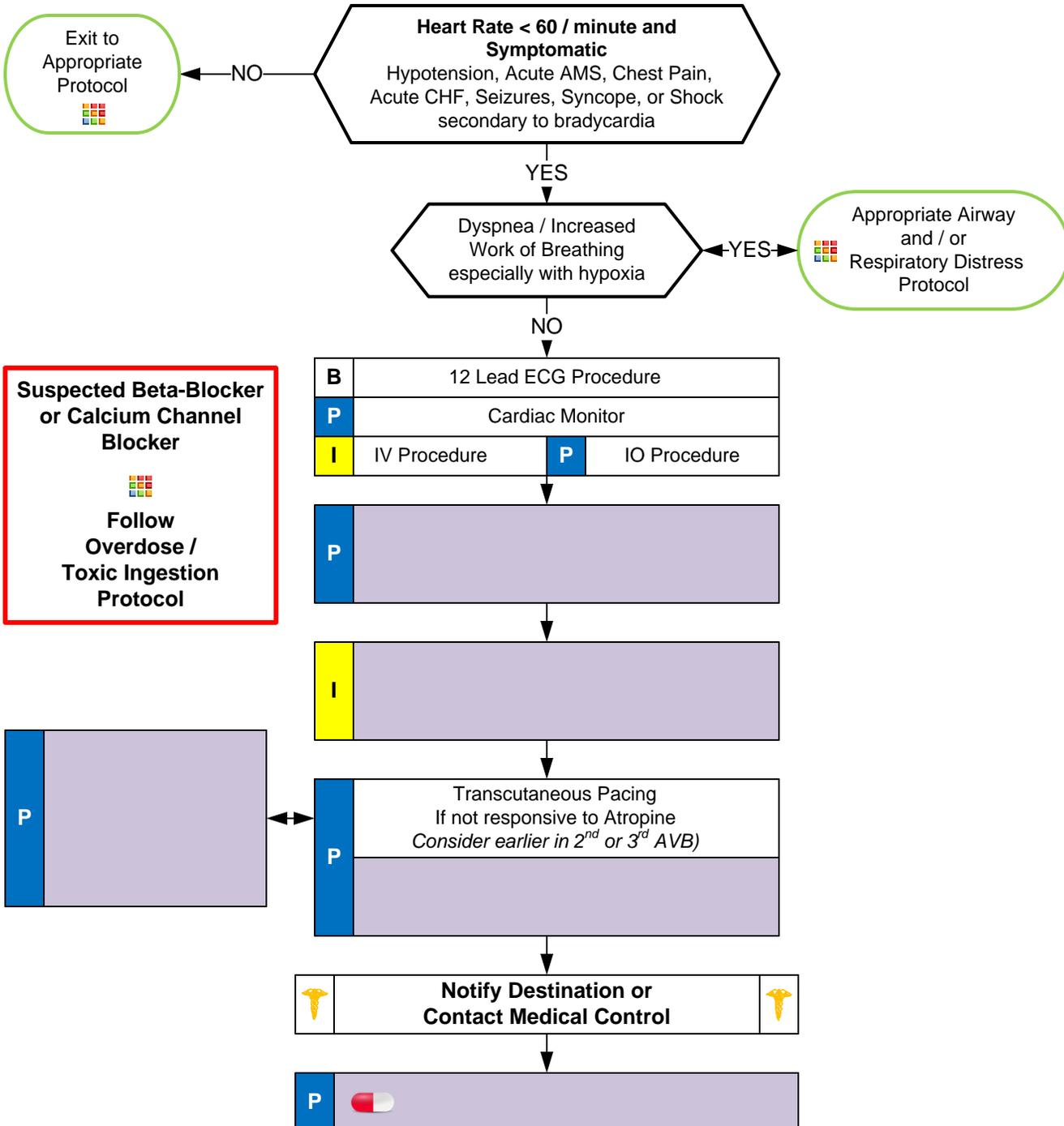
- Past medical history
- Medications
 - Beta-Blockers
 - Calcium channel blockers
 - Clonidine
 - Digoxin
- Pacemaker

Signs and Symptoms

- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

Differential

- Acute myocardial infarction
- Hypoxia
- Pacemaker failure
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury (elevated ICP) or Stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose





Bradycardia; Pulse Present



Pearls

- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Bradycardia causing symptoms is typically < 50/minute. Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Atropine: Caution in setting of acute MI. The use of Atropine for PVCs in the presence of a MI may worsen heart damage. Should not delay Transcutaneous Pacing with poor perfusion. Ineffective in cardiac transplantation.**
- Utilize transcutaneous pacing early if no response to atropine. If time allows transport to specialty center as transcutaneous pacing is a temporizing measure and patient will likely require transvenous pacemaker.
- Wide complex, bizarre appearance of complex with slow rhythm consider hyperkalemia.
- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)
- Hypoxemia is a common cause of bradycardia be sure to oxygenate the patient and support respiratory effort.

Protocol 12

Cardiac Arrest; Adult

History

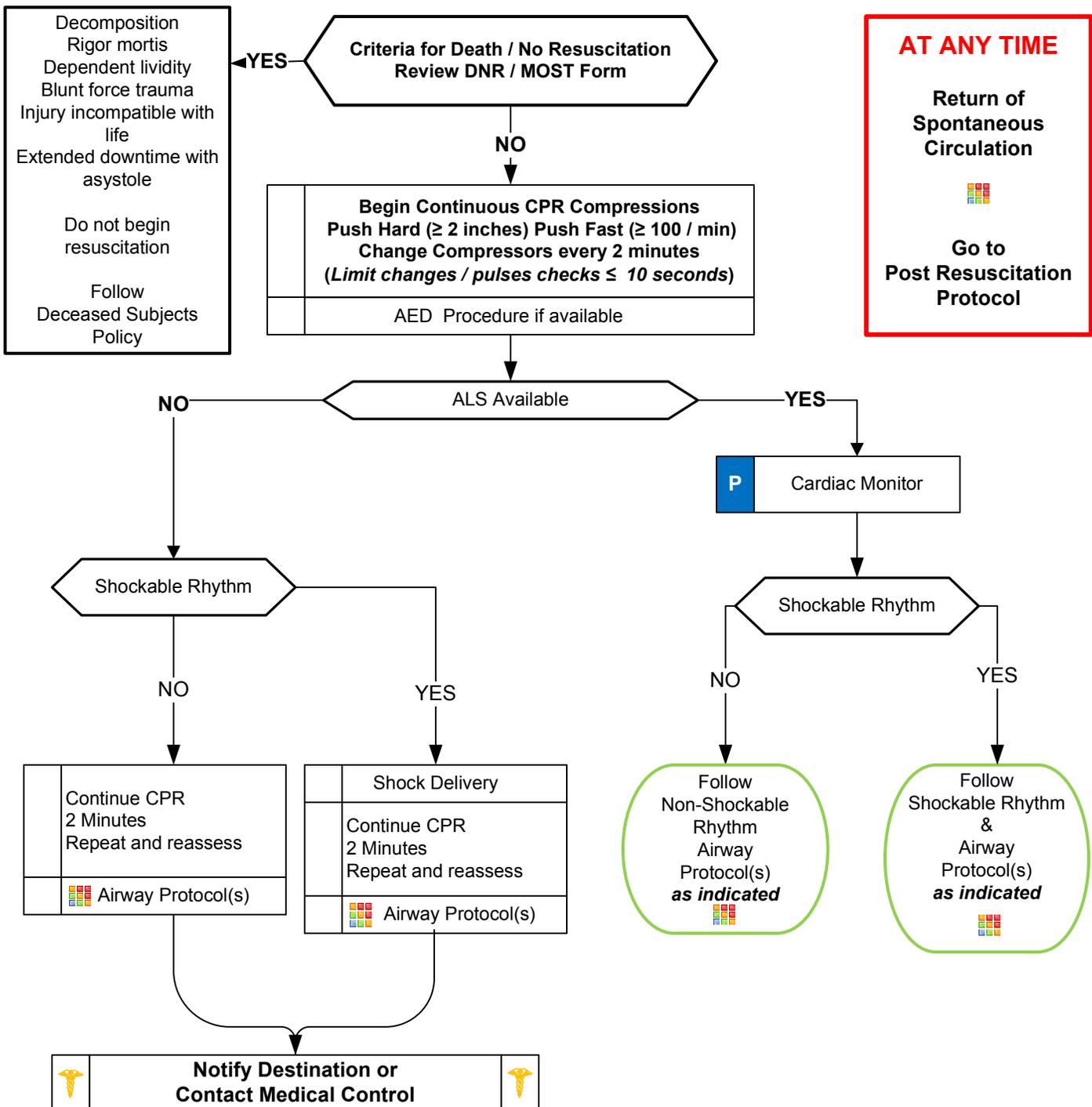
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness

Signs and Symptoms

- Unresponsive
- Apneic
- Pulseless

Differential

- Medical vs. Trauma
- VF vs. Pulseless VT
- Asystole
- PEA
- Primary Cardiac event vs. Respiratory arrest or Drug Overdose



Cardiac Arrest; Adult

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Breathing / Airway management after second shock and / or 2 rounds of compressions (2 minutes each round.)**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach assigning responders to predetermined tasks.
- Team Focused Approach / Pit-Crew Approach. Refer to optional protocol or development of local agency protocol.
- Reassess and document endotracheal tube placement and EtCO₂ frequently, after every move, and at transfer of care.
- **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
- Consider mechanical CPR (compression) device if available.
- Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
- Consider Opioid Overdose: Naloxone 2 mg IM / IV / IO / IN. EMT-B may administer Naloxone via IN route only. May give from EMS supply.
- Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.

Chest Pain: Cardiac and STEMI



History

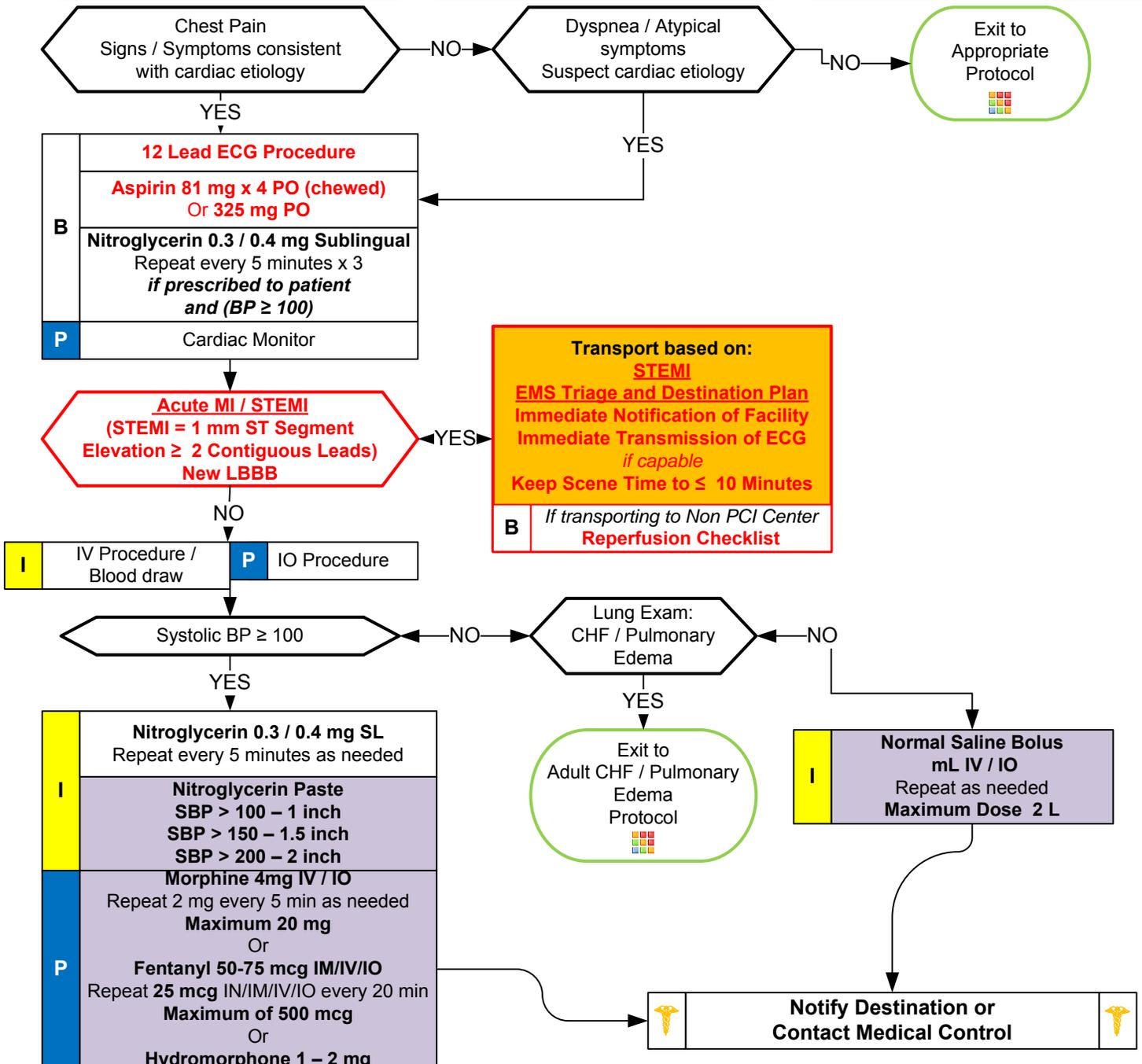
- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (1-10)
- Time (onset /duration / repetition)

Signs and Symptoms

- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**

Differential

- Trauma vs. Medical
- Angina vs. Myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GE reflux or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose (Cocaine) or Methamphetamine



Adult Cardiac Section Protocols

Updated:
09/25/14

Protocol 14

This protocol has been altered from the original 2012 NCEP Protocol by the local EMS Medical Director

2014

Chest Pain: Cardiac and STEMI

Caring for a patient with chest discomfort begins with your initial observation. When ordering your priorities, your immediate goal is to determine whether the patient is sick or not. Your first impression should tell you whether you have time to continue your assessment or if you should intercede immediately. Evaluate the patient for critical or emergent diagnoses first. Since the life-threatening diagnoses require immediate separation for management, begin your assessment to differentiate between these first. Include breath sounds to rule out a tension pneumothorax and acute pulmonary edema/congestive heart failure, move to the acute coronary syndrome rule outs (consider a 12-lead ECG as patient condition allows, but do not delay aspirin, oxygen, or nitroglycerin), check blood pressures and pulses in both upper extremities, and compare them to the lower extremities as you consider an aortic aneurysm. Often the clue to an esophageal rupture, pulmonary embolism, or other life threat is in the history, so focus your history questions to rule these out as time allows.

Standard assessment practice for the patient with chest pain should include looking for life-threatening causes and managing them appropriately – even within the primary survey. In the patient with a patent airway, assessing for breath sounds and looking for shock are key.

Life-threatening causes of chest pain usually include those diseases that produce both chest pain and increased work of breathing, or chest pain and alteration in vital signs (or a combination thereof).

If the patient is experiencing a STEMI, early notification and activation of the Cath-Lab is paramount in the treatment arm of the patient.

Non-life-threatening causes of chest pain can arise from several body systems including cardiovascular, respiratory, gastrointestinal, immunologic, structural cardiac, neurologic, and musculoskeletal.

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit**
- **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Patients with STEMI (ST-Elevation Myocardial Infarction) or positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.**
- **If CHF / Cardiogenic shock resulting from inferior (II, III, aVF) MI. Consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and narcotics (Morphine, Fentanyl, or Dilaudid).
- Nitroglycerin and opioids may be repeated per dosing guidelines.
- Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (EMT-P.)
- **EMT-B may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**
- Agency medical director may require Contact of Medical Control prior to administration.

CHF / Pulmonary Edema



History

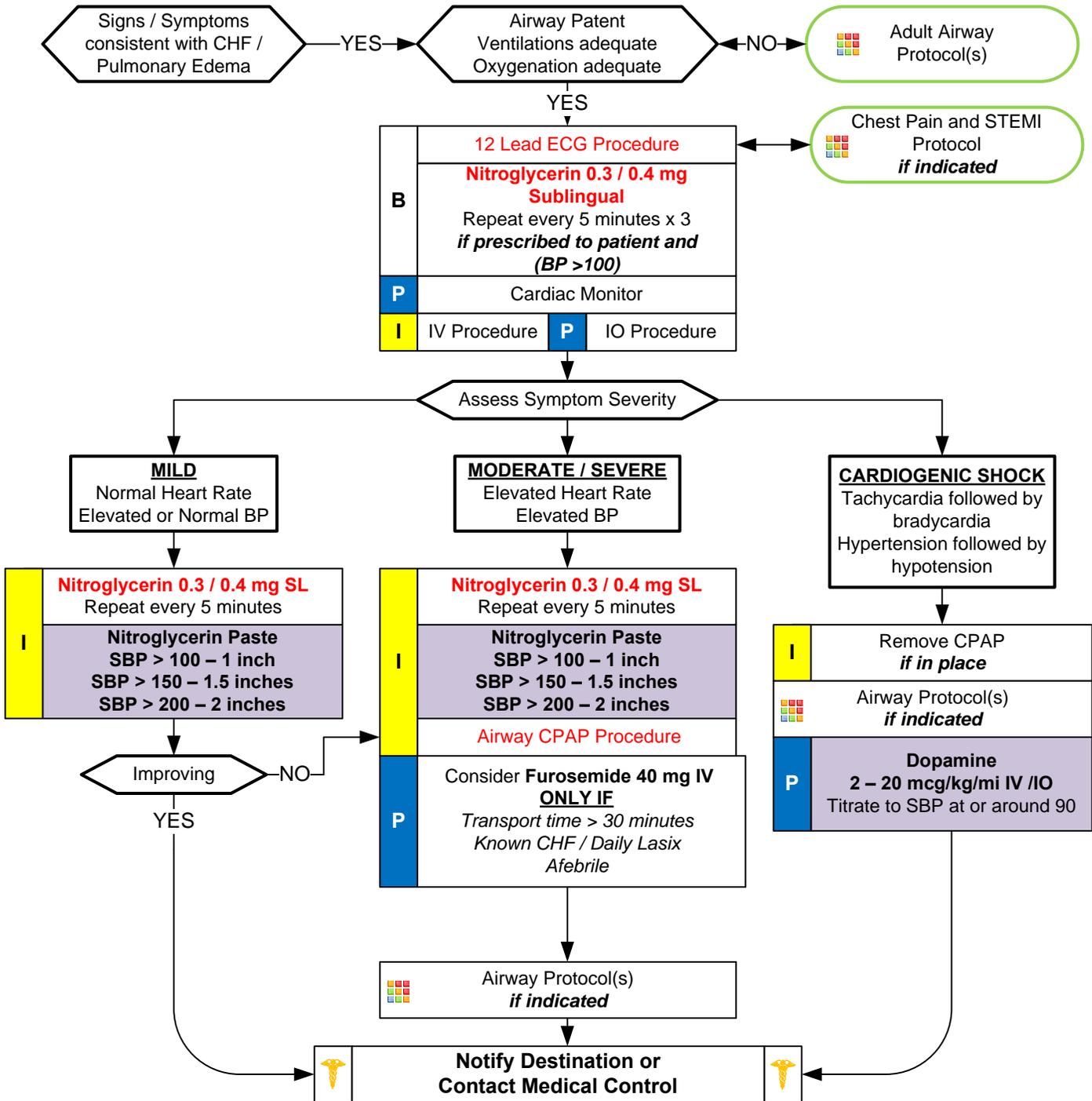
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix, Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Cardiac history --past myocardial infarction

Signs and Symptoms

- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential

- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure



Adult Cardiac Section Protocols

CHF / Pulmonary Edema



Management of heart failure is geared toward improving gas exchange and cardiac output. If the actual blood pressure is adequate (systolic blood pressure > 100 mm/Hg), help the patient get into a comfortable position. Many times this can be done with the patient sitting with legs dependent. Oxygen saturations above 90% are desired, so you should evaluate the patient for possible ventilatory assistance. If there are signs of respiratory failure along with altered mental status, intubation and invasive pulmonary ventilation will be necessary. If the patient is alert enough, noninvasive positive pressure ventilation (NIPPV) can be therapeutic in two ways: (1) decreasing venous return and preload, thereby reducing pulmonary edema, and (2) improving gas exchange.

Along with positive pressure ventilation, if the systolic blood pressure is above 100 mm/Hg, nitroglycerin has emerged as the primary treatment of pulmonary edema. Nitroglycerin acts to decrease preload through peripheral vasodilation. Caution must be exercised when employing nitroglycerin and positive pressure ventilation simultaneously; systemic blood pressure can drop quickly. Patients with subacute CHF who also feel volume overloaded may be given furosemide to initiate diuresis. Furosemide should also be used with caution because many patients with “crackles” on exam are later found to have pneumonia. Diuresis in this group of patients can be detrimental. In addition, many of those who do have CHF are not total-body-fluid overloaded; the fluid is just not distributed correctly. Diuresis can be detrimental in these patients because many have poor renal function to begin with.

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Furosemide and Opioids have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. Even though this historically has been a mainstay of EMS treatment, it is no longer routinely recommended.**
- **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- **If CHF / Cardiogenic shock resulting from inferior (II, III, aVF) MI. Consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If Nitro-paste is used, do not continue to use Nitroglycerin SL.
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.
- Consider myocardial infarction in all these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- Document CPAP application using the CPAP procedure in the PCR. Document 12 Lead ECG using the 12 Lead ECG procedure.
- **EMT-B may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**
- Agency medical director may require Contact of Medical Control.



Adult Tachycardia Narrow Complex (≤ 0.11 sec)



History

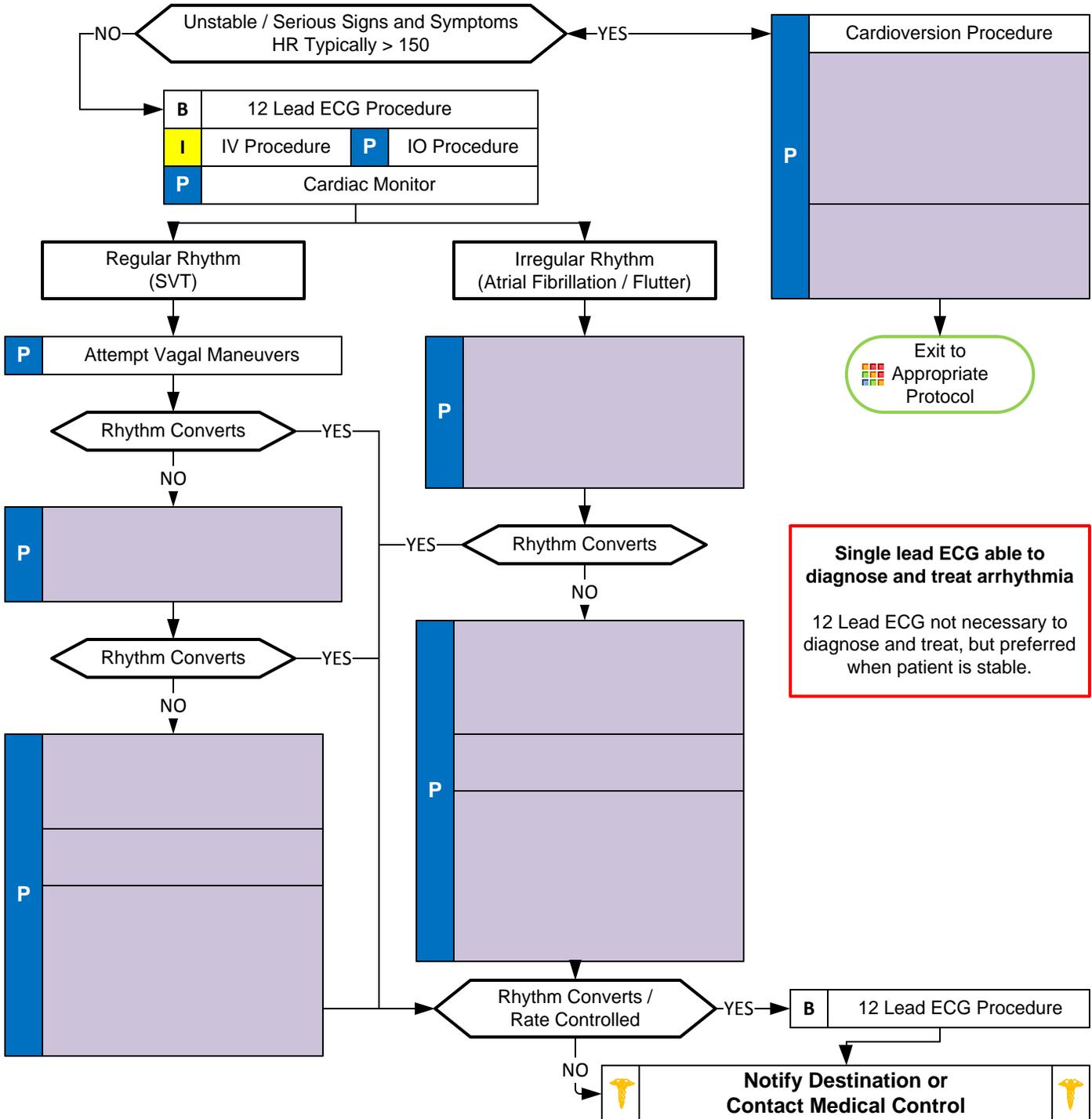
- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms

- Heart Rate > 150
- Systolic BP < 90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
 - Atrial/Sinus tachycardia
 - Atrial fibrillation / flutter
 - Multifocal atrial tachycardia
 - Ventricular Tachycardia

Differential

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus



Adult Cardiac Section Protocols



Adult Tachycardia Narrow Complex (≤ 0.11 sec)



Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic tachycardia usually occurs at rates of 120 -150 and typically ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g. Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- **Typical sinus tachycardia is in the range of 100 to (200 - patient's age) beats per minute.**
- **Regular Narrow-Complex Tachycardias:**
Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert up to 25 % of SVT.
Adenosine should be pushed rapidly via proximal IV site followed by 20 mL Normal Saline rapid flush.
Agencies using both calcium channel blockers and beta blockers need choose one primarily. Giving the agents sequentially requires Contact of Medical Control. This may lead to profound bradycardia / hypotension.
- **Irregular Tachycardias:**
First line agents for rate control are calcium channel blockers or beta blockers.
Agencies using both calcium channel blockers and beta blockers need choose one primarily. Giving the agents sequentially requires Contact of Medical Control. This may lead to profound bradycardia / hypotension.
Adenosine may not be effective in identifiable atrial fibrillation / flutter, yet is not harmful and may help identify rhythm.
- **Synchronized Cardioversion:**
Recommended to treat UNSTABLE Atrial Fibrillation, Atrial Flutter and Monomorphic-Regular Tachycardia (VT.)
- **Monitor for hypotension after administration of Calcium Channel Blockers or Beta Blockers.**
- **Monitor for respiratory depression and hypotension associated with Midazolam.**
- **Continuous pulse oximetry is required for all SVT patients.**
- **Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.**



Adult Tachycardia Wide Complex (≥ 0.12 sec)



History

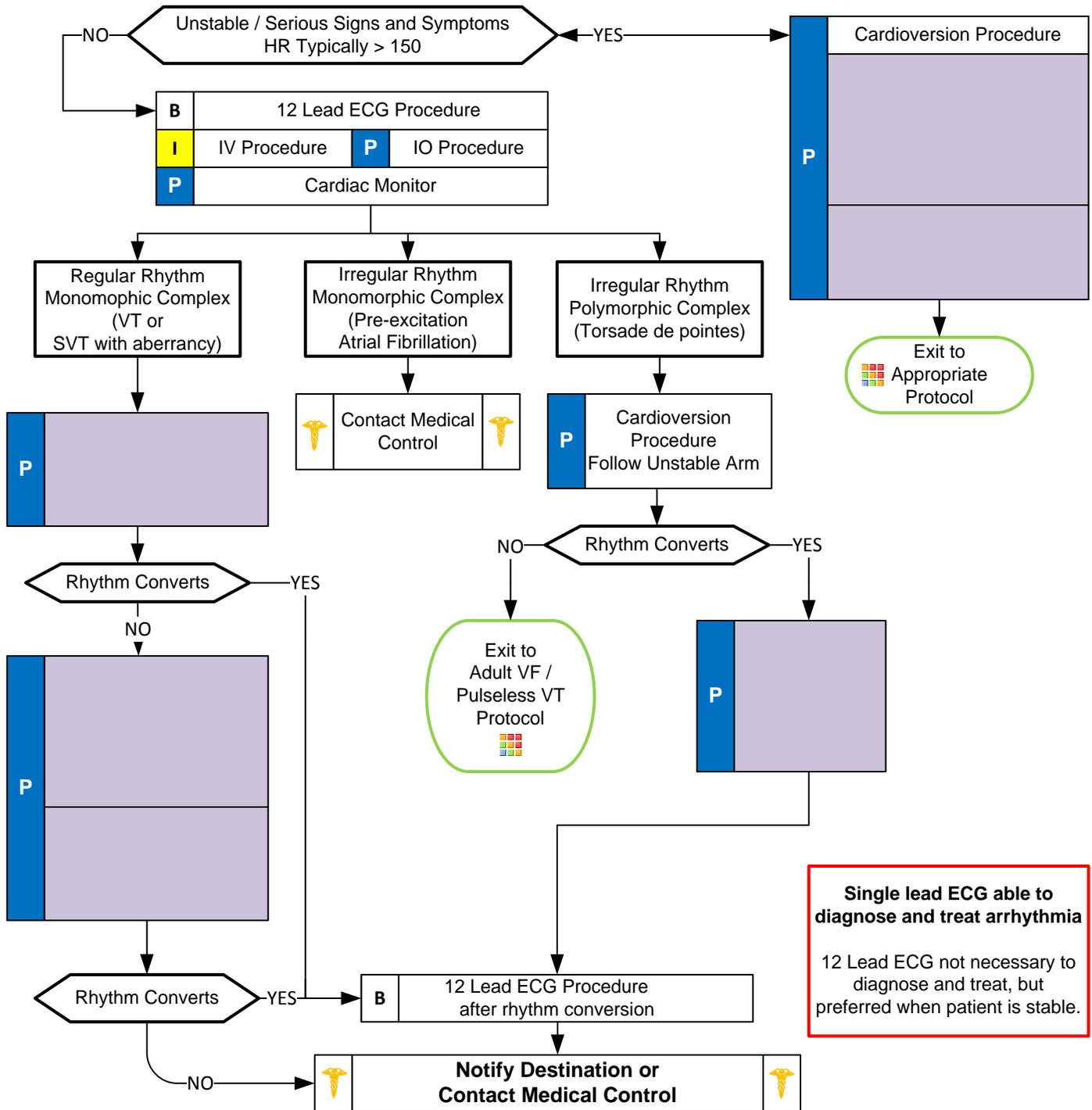
- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms

- Heart Rate > 150
- Systolic BP < 90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
 - Atrial/Sinus tachycardia
 - Atrial fibrillation / flutter
 - Multifocal atrial tachycardia
 - Ventricular Tachycardia

Differential

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus



Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

Adult Cardiac Section Protocols



Adult Tachycardia

Wide Complex (≥ 0.12 sec)



Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- Symptomatic tachycardia usually occurs at rates of 120 – 150 and typically ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.
- **Serious Signs / Symptoms:**
 - Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.
- Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.
- If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.
- Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.
- Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.
- **Regular Wide-Complex Tachycardias:**
 - **Unstable condition:**
 - Immediate cardioversion or pre-cordial thump if defibrillator not available.
 - **Stable condition:**
 - Typically VT or SVT with aberrancy. Adenosine may be given if regular and monomorphic and if defibrillator available.
 - Verapamil contraindicated in wide-complex tachycardias.
 - Agencies using Amiodarone, Procainamide and Lidocaine need choose one agent primarily. Giving multiple anti-arrhythmics requires contact of medical control.
 - Atrial arrhythmias with WPW should be treated with Amiodarone or Procainamide
- **Irregular Tachycardias:**
 - Wide-complex, irregular tachycardia: Do not administer calcium channel or beta blockers, adenosine as this may cause paradoxical increase in ventricular rate. This will usually require cardioversion. Contact medical control.
- **Polymorphic / Irregular Tachycardia:**
 - This situation is usually unstable and immediate defibrillation is warranted.
 - When associated with prolonged QT this is likely Torsades de pointes: Give 2 gm of Magnesium Sulfate slow IV / IO.
 - Without prolonged QT likely related to ischemia and Magnesium may not be helpful.
- Monitor for respiratory depression and hypotension associated with Midazolam.
- Continuous pulse oximetry is required for all SVT Patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.

Shockable Rhythm (Cardiac Arrest)

History

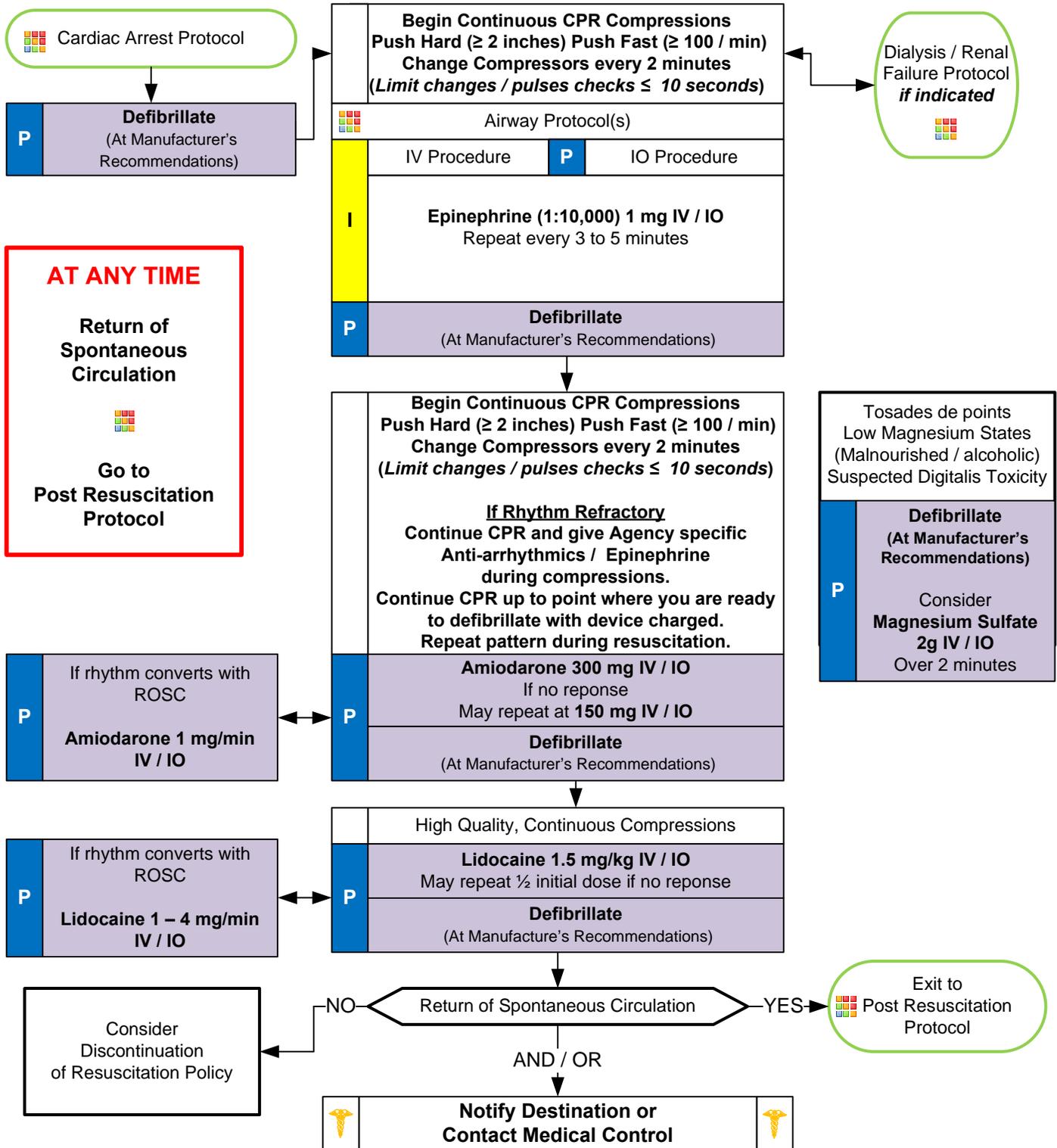
- Estimated down time
- Past Medical History
- Medications
- Events leading to arrest
- Renal failure / Dialysis
- DNR or MOST form

Signs and Symptoms

- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on EKG

Differential

- Asystole
- Artifact / Device Failure
- Cardiac
- Endocrine / Medicine
- Drugs
- Pulmonary



Shockable Rhythm (Cardiac Arrest)



Pearls

- **Recommended Exam: Mental Status**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Breathing / Airway management after second shock and / or 2 rounds of compressions (2 minutes each round.)**
- **Avoid Procainamide in CHF or prolonged QT.**
- Effective CPR and prompt defibrillation are the keys to successful resuscitation.
- If no IV / IO, drugs that can be given down ET tube should have dose doubled and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV / IO is the preferred route when available.
- Reassess and document endotracheal tube placement and EtCO₂ frequently, after every move, and at transfer of care.
- Do not stop CPR to check for placement of ET tube or to give medications.
- If BVM is ventilating the patient successfully, intubation should be deferred until rhythm has changed or 4 or 5 defibrillation sequences have been completed.
- Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.
- Sodium bicarbonate no longer recommended. Consider in the dialysis / renal patient, known hyperkalemia or tricyclic overdose at 50 mEq total IV / IO.
- Follow manufacturer's recommendations concerning defibrillation / cardioversion energy when specified.

Post Resuscitation

History

- Respiratory arrest
- Cardiac arrest

Signs/Symptoms

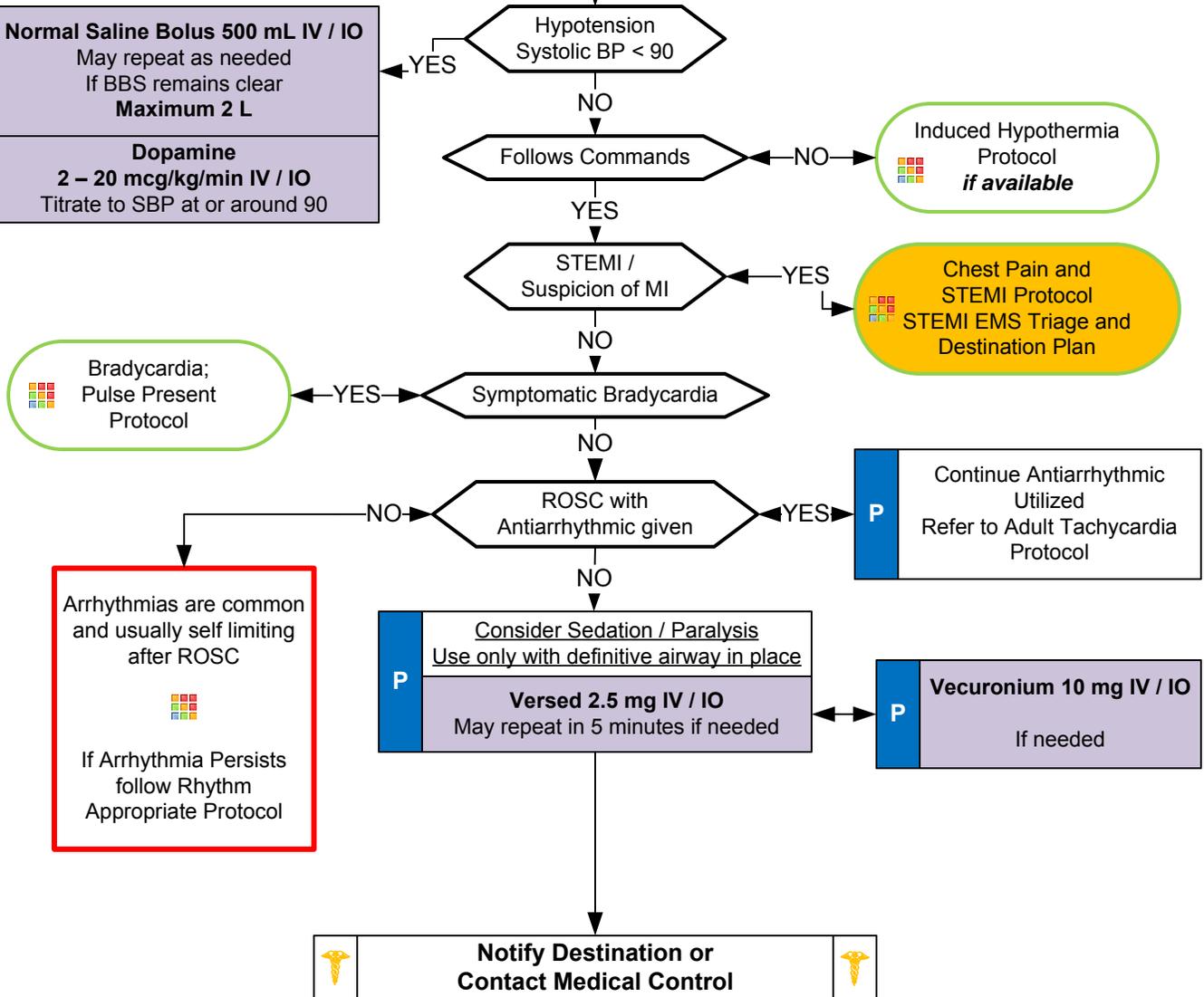
- Return of pulse

Differential

- Continue to address specific differentials associated with the original dysrhythmia

Repeat Primary Assessment	
B	Optimize Ventilation and Oxygenation <ul style="list-style-type: none"> • Maintain SpO2 ≥ 94 % • Advanced airway <i>if indicated</i> • ETCO2 ideally 35 – 45 mm Hg • Respiratory Rate 8 – 12 / minute • Remove Impedance Threshold Device • DO NOT HYPERVENTILATE
I	IV Procedure P IO Procedure
B	12 Lead ECG Procedure
P	Cardiac Monitor
	Monitor Vital Signs / Reassess

I	Normal Saline Bolus 500 mL IV / IO May repeat as needed If BBS remains clear Maximum 2 L
P	Dopamine 2 – 20 mcg/kg/min IV / IO Titrate to SBP at or around 90



Post Resuscitation

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Continue to search for potential cause of cardiac arrest during post-resuscitation care.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.**
- **Initial End tidal CO₂ may be elevated immediately post-resuscitation but will usually normalize. While goal is 35 – 45 mm Hg avoid hyperventilation.**
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiac catheterization and intensive care service.**
- Most patients immediately post resuscitation will require ventilatory assistance.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with medical control.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Titrate Dopamine or other vasopressors to maintain SAP \geq 90. Ensure adequate fluid resuscitation is ongoing.

Induced Hypothermia

History

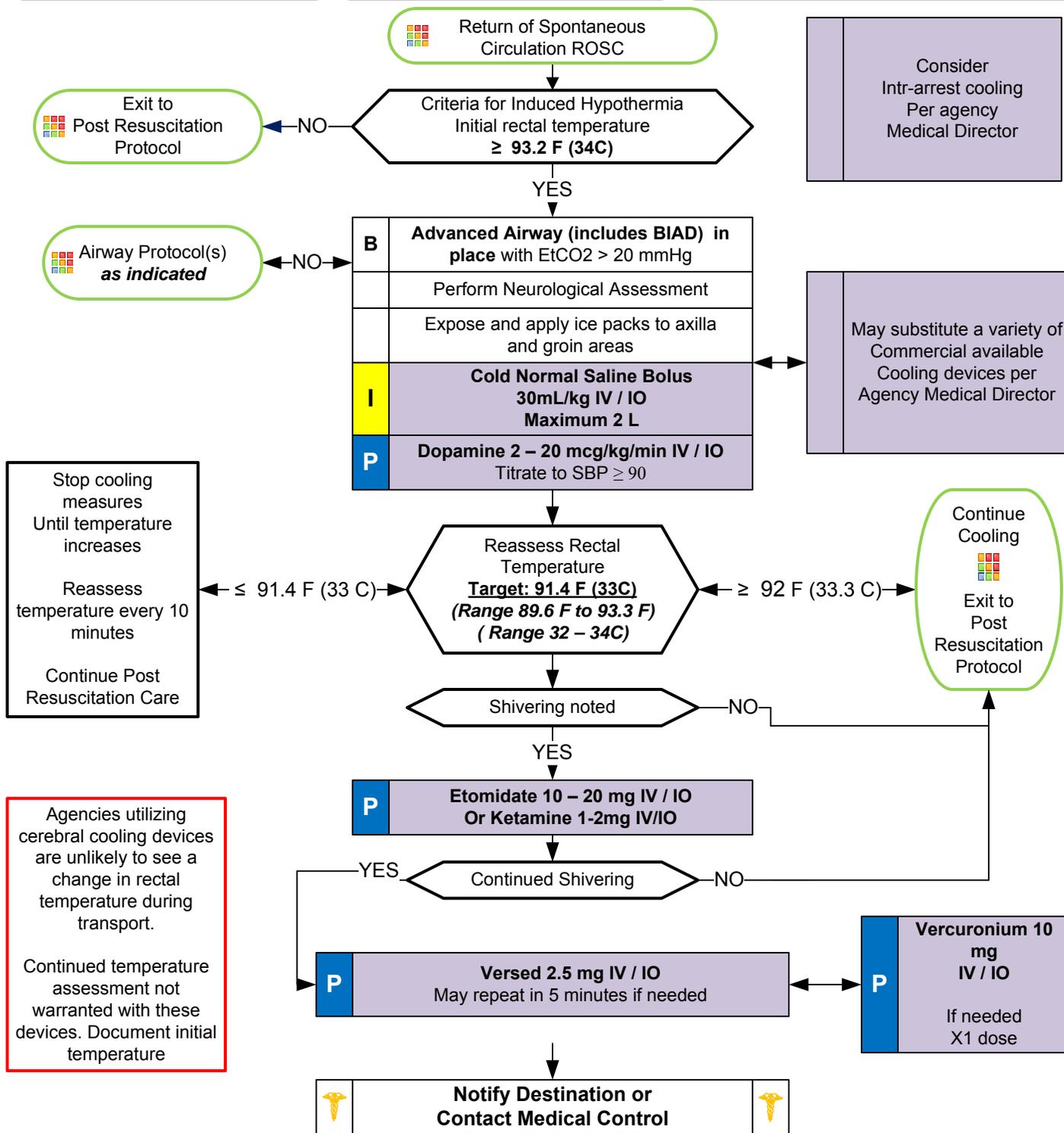
- Non-traumatic cardiac arrests (drownings and hanging / asphyxiation are permissible in this protocol.)
- All presenting rhythms are permissible in this protocol
- Age 18 or greater

Signs and Symptoms

- Cardiac arrest
- Return of Spontaneous Circulation post-cardiac arrest

Differential

- Continue to address specific differentials associated with the arrhythmia

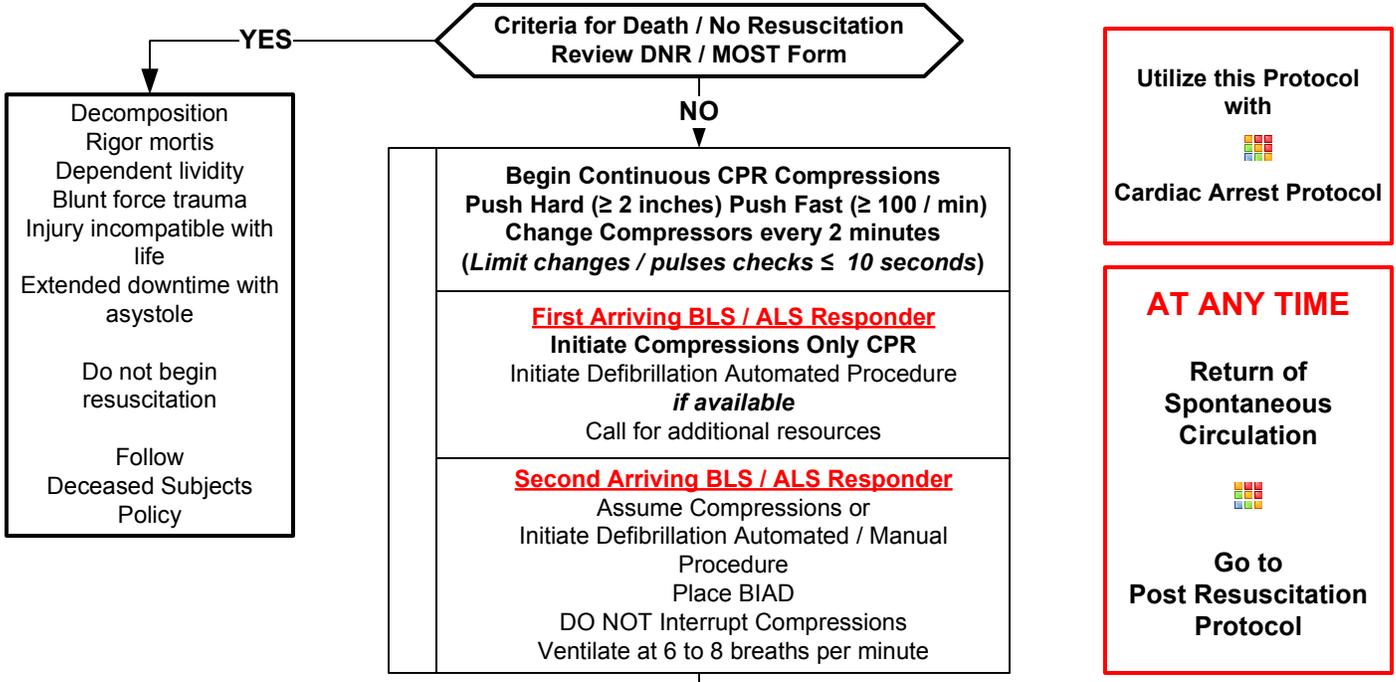


Induced Hypothermia

Pearls

- **Criteria for Induced Hypothermia:**
 - **Return of spontaneous circulation not related to blunt / penetrating trauma or hemorrhage.**
 - **Temperature greater than 93 degrees (34 C).**
 - **Advanced airway (including BIAD) in place with no purposeful response to verbal commands.**
- Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.
- Initial End tidal CO₂ may be elevated immediately post-resuscitation but will usually normalize. While goal is 35 – 45 mm Hg avoid hyperventilation.
- Utilization of this protocol mandates transport to facility capable of managing the post-arrest patient and continuation of induced hypothermia therapy.
- If no advanced airway in place obtained, cooling may only be initiated on order from medical control.
- Maintain patient modesty. Undergarments may remain in place during cooling.
- Monitor advanced airway frequently, especially after any movement of patient.

Team Focused CPR (Pit Crew)



BLS

<p>Establish Team Leader (Hierarchy) Fire Department or Squad Officer EMT-B First Arriving Responder</p>
<p>Rotate with Compressor To prevent Fatigue and effect high quality compressions Take direction from Team Leader</p>
<p>Fourth / Subsequent Arriving Responders Take direction from Team Leader</p>
<p> Continue Cardiac Arrest Protocol</p>

ALS

I	<p>Establish Team Leader (Hierarchy) EMS ALS Personnel Fire Department or Squad Officer EMT-B First Arriving Responder</p>
	<p>Initiate Defibrillation Automated Procedure Establish IV / IO Administer Appropriate Medications Establish Airway with BIAD if not in place</p>
P	<p>Initiate Defibrillation Manual Procedure Continuous Cardiac Monitoring Establish IV / IO Administer Appropriate Medications Establish Airway with BIAD if not in place</p>
	<p> Continue Cardiac Arrest Protocol</p>

<p>Team Leader ALS Personnel Responsible for patient care Responsible for briefing / counseling family</p>
<p>Incident Commander Fire Department / First Responder Officer Team Leader until ALS arrival Manages Scene / Bystanders Ensures high-quality compressions Ensures frequent compressor change Responsible for briefing family prior to ALS arrival</p>

Adult Cardiac Section Protocols

Team Focused CPR (Pit Crew)

Pearls

- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.
- **DO NOT HYPERVENTILATE:** If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute.
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.

	<p>This protocol is intentionally left blank for future expansion</p>	
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Abdominal Pain

History

- Age
- Past medical / surgical history
- Medications
- Onset
- Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (1-10)
- Time (duration / repetition)
- Fever
- Last meal eaten
- Last bowel movement / emesis
- Menstrual history (pregnancy)

Signs and Symptoms

- Pain (location / migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation
- Vaginal bleeding / discharge
- Pregnancy

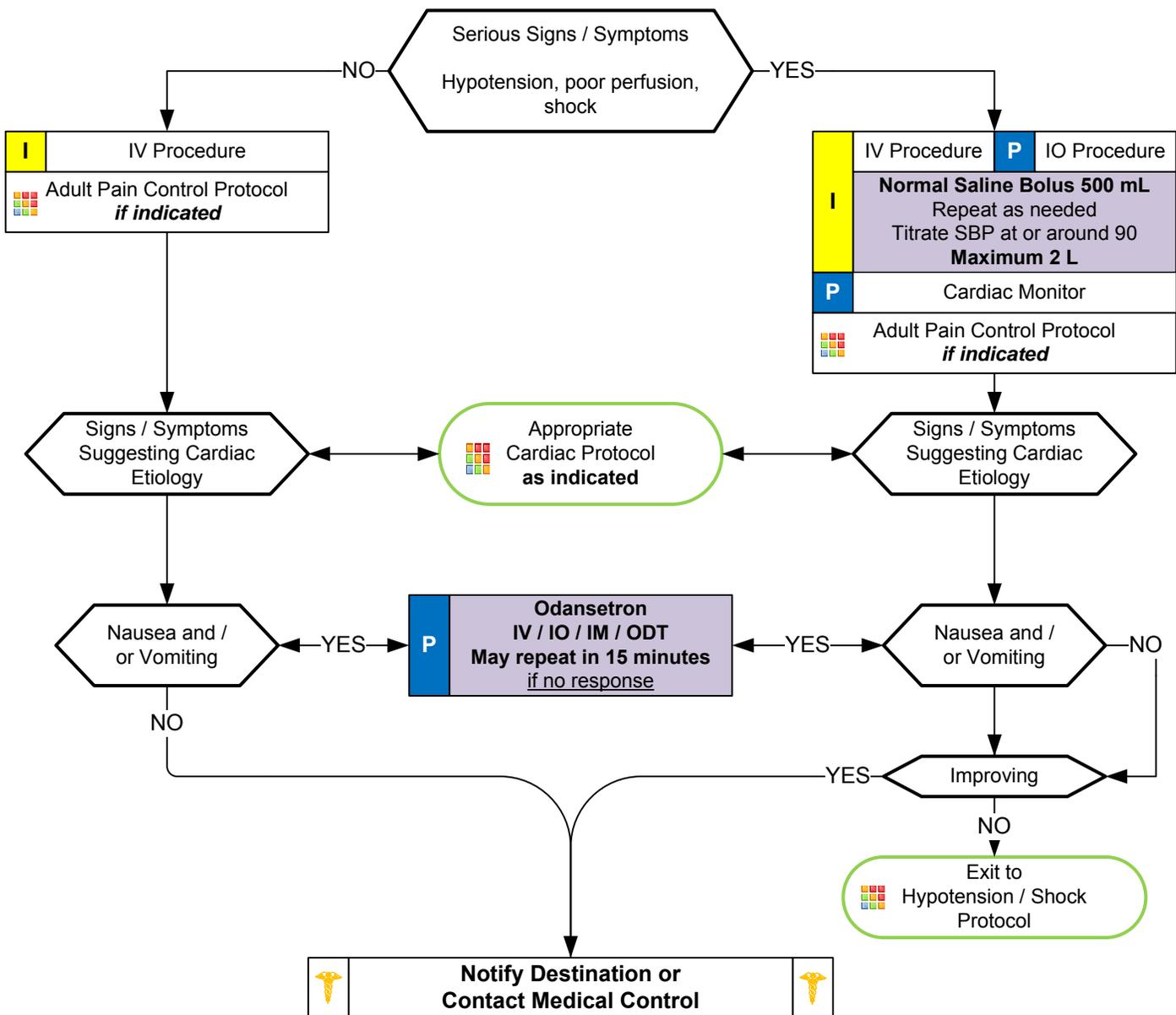
Associated symptoms:

(Helpful to localize source)

Fever, headache, weakness, malaise, myalgias, cough, headache, mental status changes, rash

Differential

- Pneumonia or Pulmonary embolus
- Liver (hepatitis, CHF)
- Peptic ulcer disease / Gastritis
- Gallbladder
- Myocardial infarction
- Pancreatitis
- Kidney stone
- Abdominal aneurysm
- Appendicitis
- Bladder / Prostate disorder
- Pelvic (PID, Ectopic pregnancy, Ovarian cyst)
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)
- Ovarian and Testicular Torsion



Abdominal Pain



The most common GI complaint is abdominal pain. Despite or perhaps because of the frequency of the complaint, determining its cause can be challenging. Often the complaint of abdominal pain is vague and ill defined. A good patient history and understanding of the pathophysiology of the GI system will help providers understand how to take a history and assess this common complaint in a reassuring and supportive way.

The very young and the elderly may have difficulty relaying pain to clinicians. Both have a different perception of pain, and both localize pain differently. Older patients may get confused about where pain actually originates and often live with chronic pain that may affect their perception of pain. Pediatric patients poorly localize the exact pain location and may have difficulty verbalizing their pain.

One complicating factor in the diagnosis of abdominal pain is that the perception of discomfort varies widely depending on its cause and the patient's individual level of tolerance. Abdominal pain often evolves over time, becoming better defined as the disease process progresses. Abdominal pain can be divided into three categories: visceral pain, parietal pain, and referred pain.

The rule of thumb is to consider the more common or likely diagnosis and work toward the less common. To confirm or rule out conditions that make up your differential diagnosis, obtain an accurate history, onset, provocation/palliation, radiation of pain, severity and time of onset, and couple those with a good physical examination. Because the possible causes of abdominal discomfort are so numerous, it is important to recognize that you may not be able to make a definitive diagnosis in the field. Offering supportive care, managing signs and symptoms and treating pain and transporting are the best strategies for many patients with abdominal discomfort.

Making a diagnosis should not take precedence over intervention or treating pain in a patient with abdominal discomfort.

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neuro**
- Document the mental status and vital signs prior to administration of anti-emetics
- Abdominal pain in women of childbearing age should be treated as pregnancy related until proven otherwise.
- Antacids should be avoided in patients with renal disease.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain especially in patients over 50 and / or patients with shock/ poor perfusion.
- Repeat vital signs after each fluid bolus.
- The use of metoclopramide (Reglan) may worsen diarrhea and should be avoided in patients with this symptom.
- Choose the lower dose of promethazine (Phenergan) for patients likely to experience sedative effects (e.g., Age \geq 60, debilitated, etc.) When giving promethazine IV dilute with 10 mL of normal saline and administer slowly.
- Consider cardiac etiology in patients $>$ 50, diabetics and / or women especially with upper abdominal complaints.

Allergic Reaction / Anaphylaxis

History

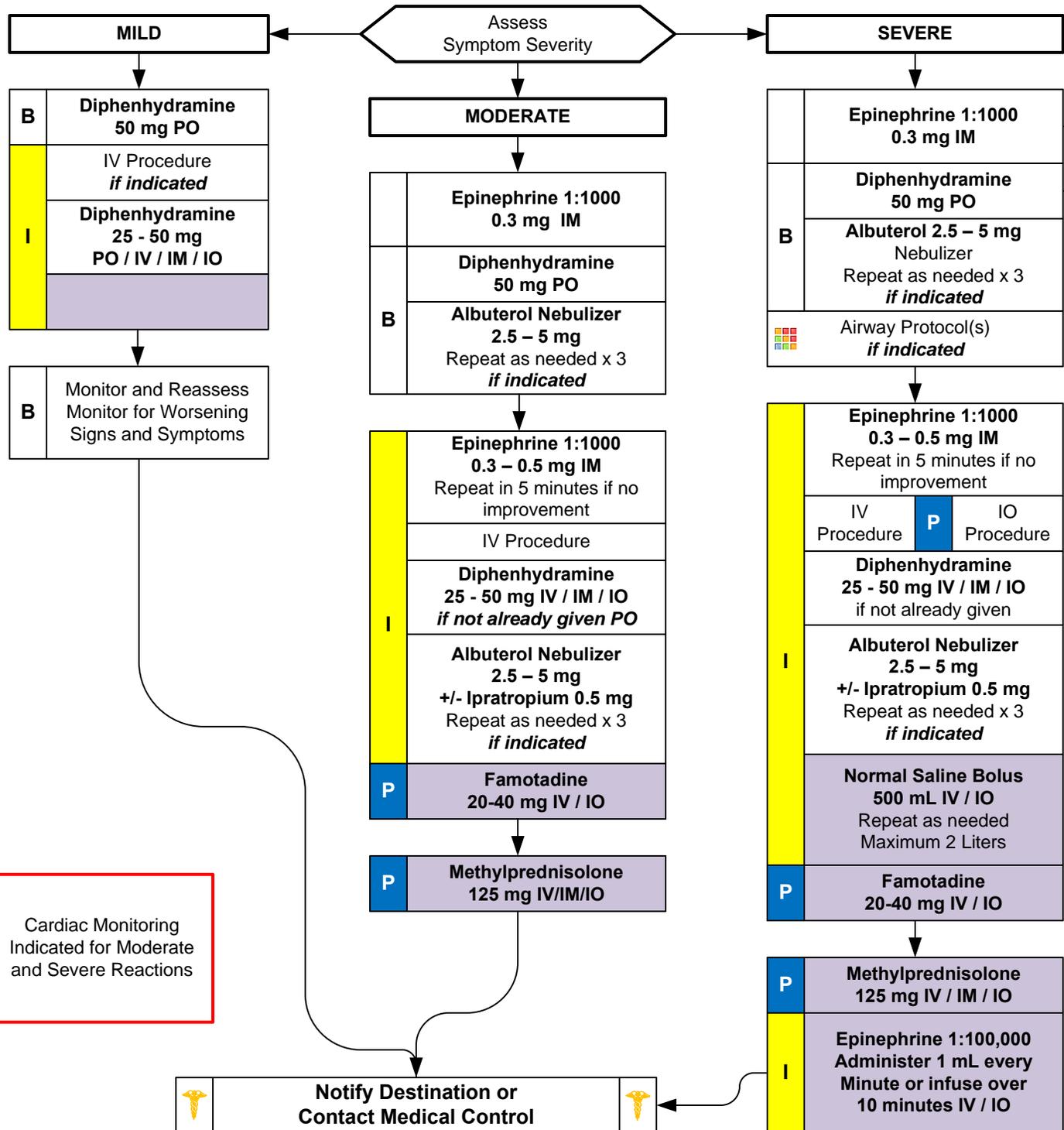
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms

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

Differential

- Urticarial (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF



Cardiac Monitoring Indicated for Moderate and Severe Reactions

Allergic Reaction / Anaphylaxis

Mixing Epinephrine 1:100,000

Dilute 1 mg of Epinephrine into
1000 mL of Normal Saline

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.)**
- **Symptom Severity Classification:**
 - Mild symptoms:**
Flushing, hives, itching, erythema with normal blood pressure and perfusion.
 - Moderate symptoms:**
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.
 - Severe symptoms:**
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.
- Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.
- Patients who are ≥ 50 years of age, have a history of cardiac disease, take Beta-Blockers / Digoxin or patient's who have heart rates ≥ 150 give one-half the dose of epinephrine (0.15 – 0.25 mg of 1:1000.) Epinephrine may precipitate cardiac ischemia. These patients should receive a 12 lead ECG at some point in their care, but this should NOT delay administration of epinephrine.
- MR / EMT-B may administer Epinephrine IM and may administer from EMS supply.
- EMT-B may administer diphenhydramine by oral route only and may administer from EMS supply.
- EMT-B may administer Albuterol / Ipratropium if patient already prescribed and may administer from EMS supply.
- Any patient with respiratory symptoms or extensive reaction should receive IV or IM diphenhydramine.
- The shorter the onset from symptoms to contact, the more severe the reaction.



Altered Mental Status



History

- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleep habits

Signs and Symptoms

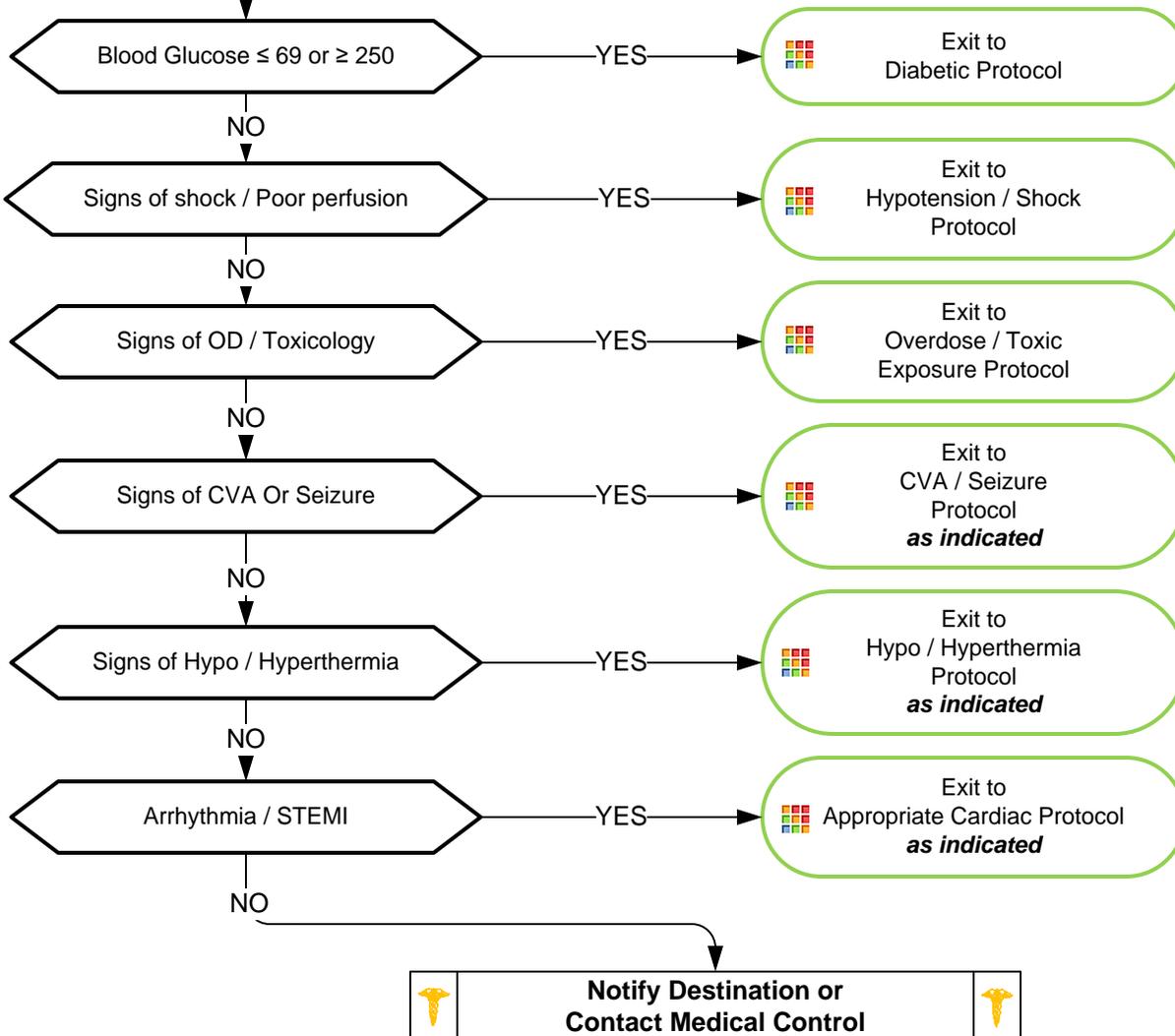
- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

Differential

- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection (CNS and other)
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or Ingestion
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

Airway Protocol(s) <i>if indicated</i>	
	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure
I	IV Procedure P IO Procedure

Utilize Spinal Immobilization Protocol where circumstances suggest a mechanism of injury.



Adult Medical Section Protocols



Altered Mental Status



Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.**
- **Pay careful attention to the head exam for signs of bruising or other injury.**
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and may have unrecognized injuries.
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.

Adult COPD / Asthma

History

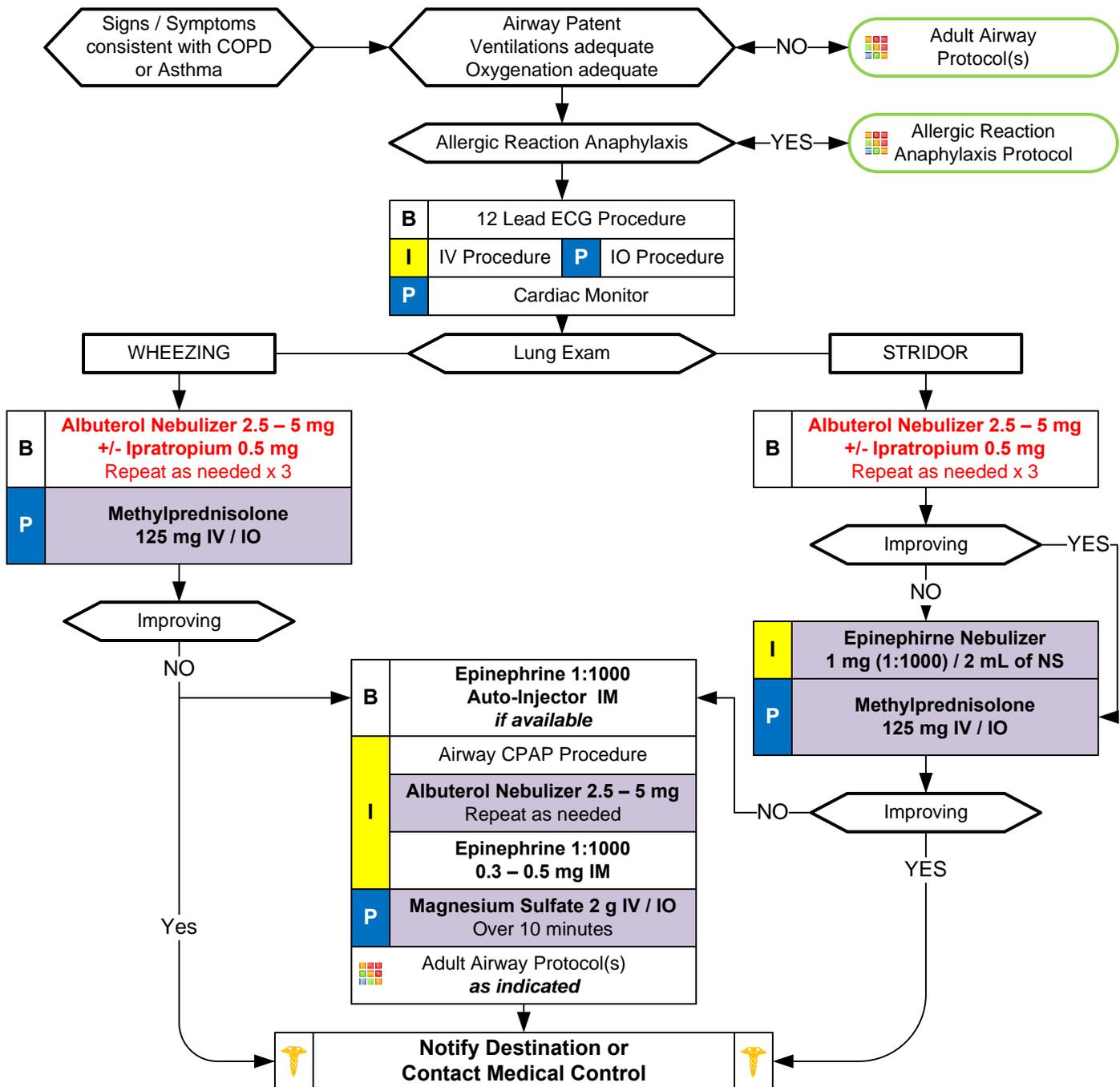
- Asthma; COPD -- chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

Signs and Symptoms

- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Fever, cough
- Tachycardia

Differential

- Asthma
- Anaphylaxis
- Aspiration
- COPD (Emphysema, Bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (Carbon monoxide, etc.)



Adult Medical Section Protocols

Adult COPD / Asthma

Levalbuterol may be considered at 0.63-1.25 mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate \leq 150.

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Contact Medical Control prior to administering epinephrine in patients who are >50 years of age, have a history of cardiac disease, or if the patient's heart rate is >150. Epinephrine may precipitate cardiac ischemia. A 12-lead ECG should be performed on these patients.**
- **Patients who are \geq 50 years of age, have a history of cardiac disease, take Beta-Blockers / Digoxin or patient's who have heart rates \geq 150 give one-half the dose of epinephrine (0.15 – 0.25 mg of 1:1000.) Epinephrine may precipitate cardiac ischemia.**
- **Pulse oximetry should be monitored continuously.**
- ETCO₂ should be used when Respiratory Distress is significant and does not respond to initial Beta-Agonist dose.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **EMT-B may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.
- **MR / EMT-B may administer Epinephrine IM for anaphylaxis only and may administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.

Diabetic; Adult

History

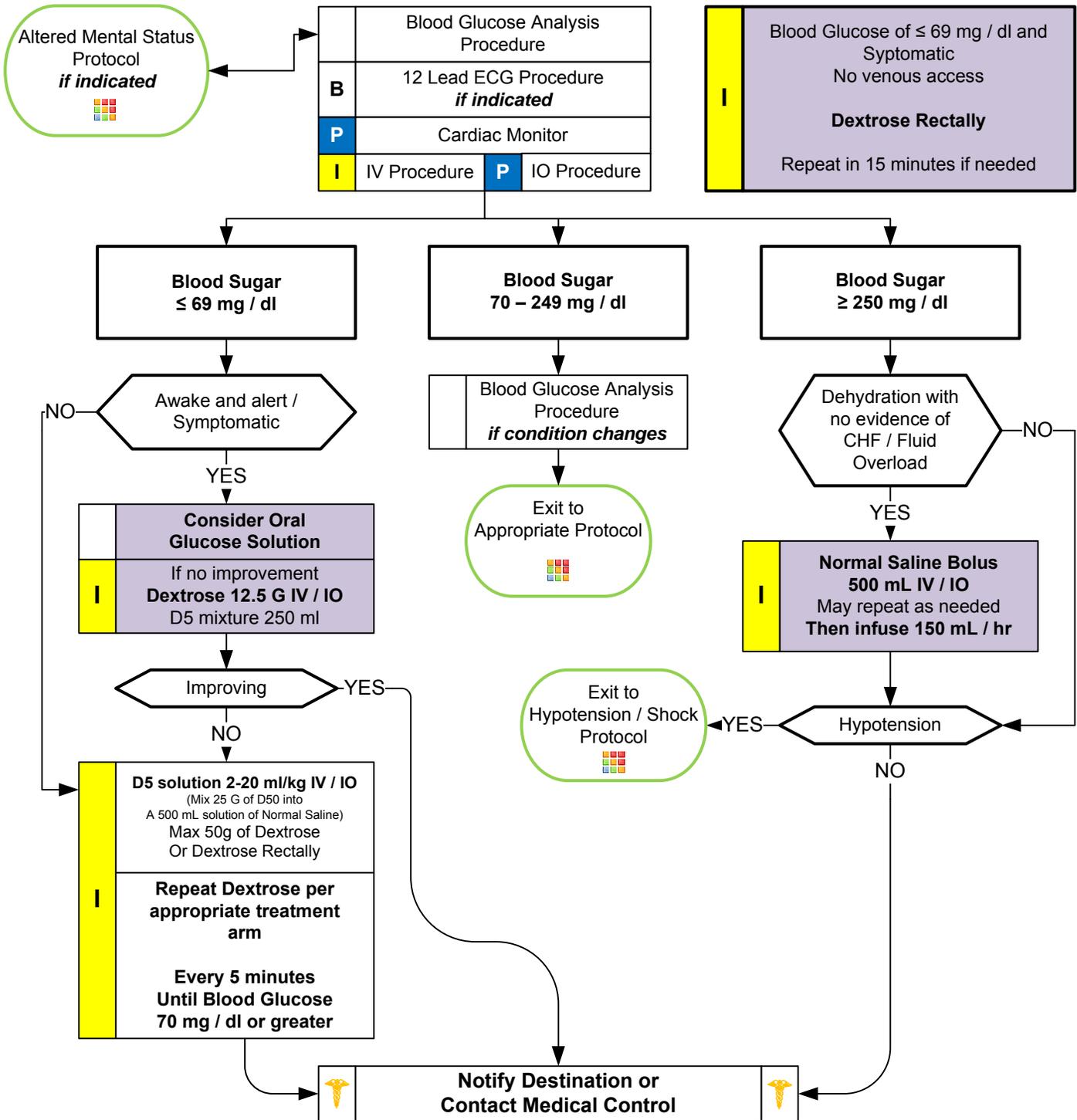
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms

- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential

- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.



Diabetic; Adult



Consider placing D50 into 500ml of fluid for administration of the first 12.5g.

Because diabetics tend to incur a disproportionate incidence of cardiac problems, consider ECG evaluation. If correction of dehydration, hypoglycemia, hyperglycemia, or acidosis fails to abolish a cardiac dysrhythmia, refer to appropriate protocol. Supplemental dextrose provides the best means for reversing hypoglycemia. For the hypoglycemic who merely displays confusion and has the ability to swallow and obey commands, oral ingestion of food, drink, or instant glucose is in order. For any lethargic, stuporous, or comatose hypoglycemic patient or for one who is unable to swallow and to understand or obey your commands, who would possibly aspirate oral glucose, intravenous/intraosseous administration of dextrose is indicated.

If a peripheral IV or IO cannot be established, rectal glucose administration may be done, and works effectively within 10 minutes.

Pearls

- **Recommended exam: Mental Status, Skin, Respirations and effort, Neuro.**
- Patients with prolonged hypoglycemia may not respond to glucagon.
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- In extreme circumstances with no IV/IO and Dextrose 50%, 25%, or D5W can be administered rectally. Contact medical control for advice if necessary. D5W functions less effectively rectally than higher concentrations.
- Quality control checks should be maintained per manufacturers recommendation for all glucometers.
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
- **Oral Agents:**
Patient's taking oral diabetic medications should be strongly encouraged to allow transportation to a medical facility. They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established. Not all oral agents have prolonged action so Contact Medical Control for advice. Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Insulin Agents:**
Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established. Not all insulins have prolonged action so Contact Medical Control for advice. Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.



Dialysis / Renal Failure



History

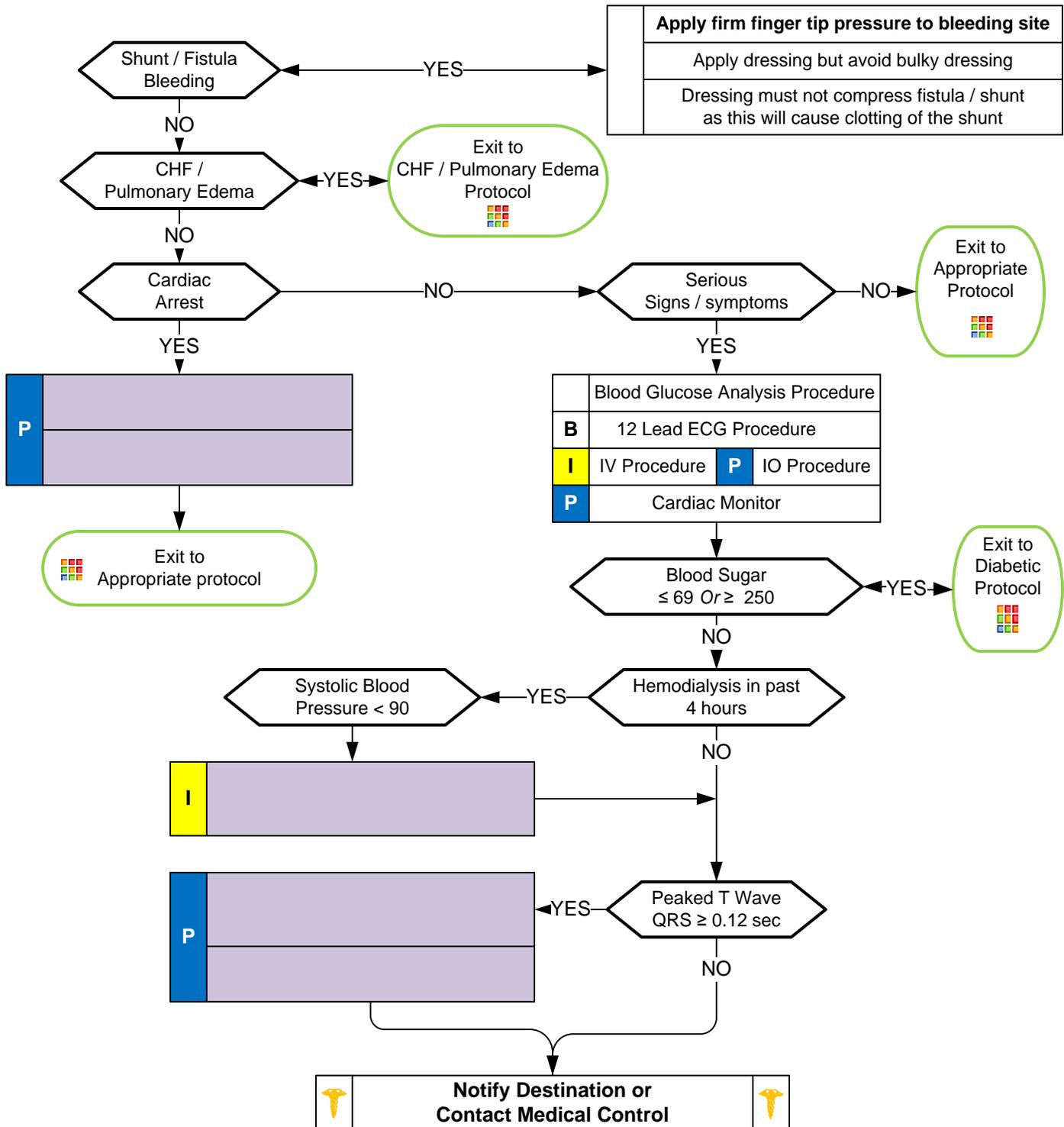
- Peritoneal or Hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

Signs and Symptoms

- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea and / or vomiting
- Altered Mental Status
- Seizure
- Arrhythmia

Differential

- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade





Dialysis / Renal Failure



Pearls

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **Do not take Blood Pressure or start IV in extremity which has a shunt / fistula in place.**
- **Access of shunt indicated in the dead or near-dead patient only with no other available access. IO if available.**
- **Use of tourniquet with uncontrolled dialysis fistula bleeding requires Contact of Medical Control.**
- Always consider Hyperkalemia in all dialysis or renal failure patients.
- Sodium Bicarbonate and Calcium Chloride / Gluconate should not be mixed. Ideally give in separate lines.
- Renal dialysis patients have numerous medical problems typically. Hypertension and cardiac disease are prevalent.



Hypertension



History

- Documented Hypertension
- Related diseases: Diabetes; CVA; Renal Failure; Cardiac Problems
- Medications for Hypertension
- Compliance with Hypertensive Medications
- Erectile Dysfunction medications
- Pregnancy

Signs and Symptoms

One of these

- Systolic BP 220 or greater
- Diastolic BP 120 or greater

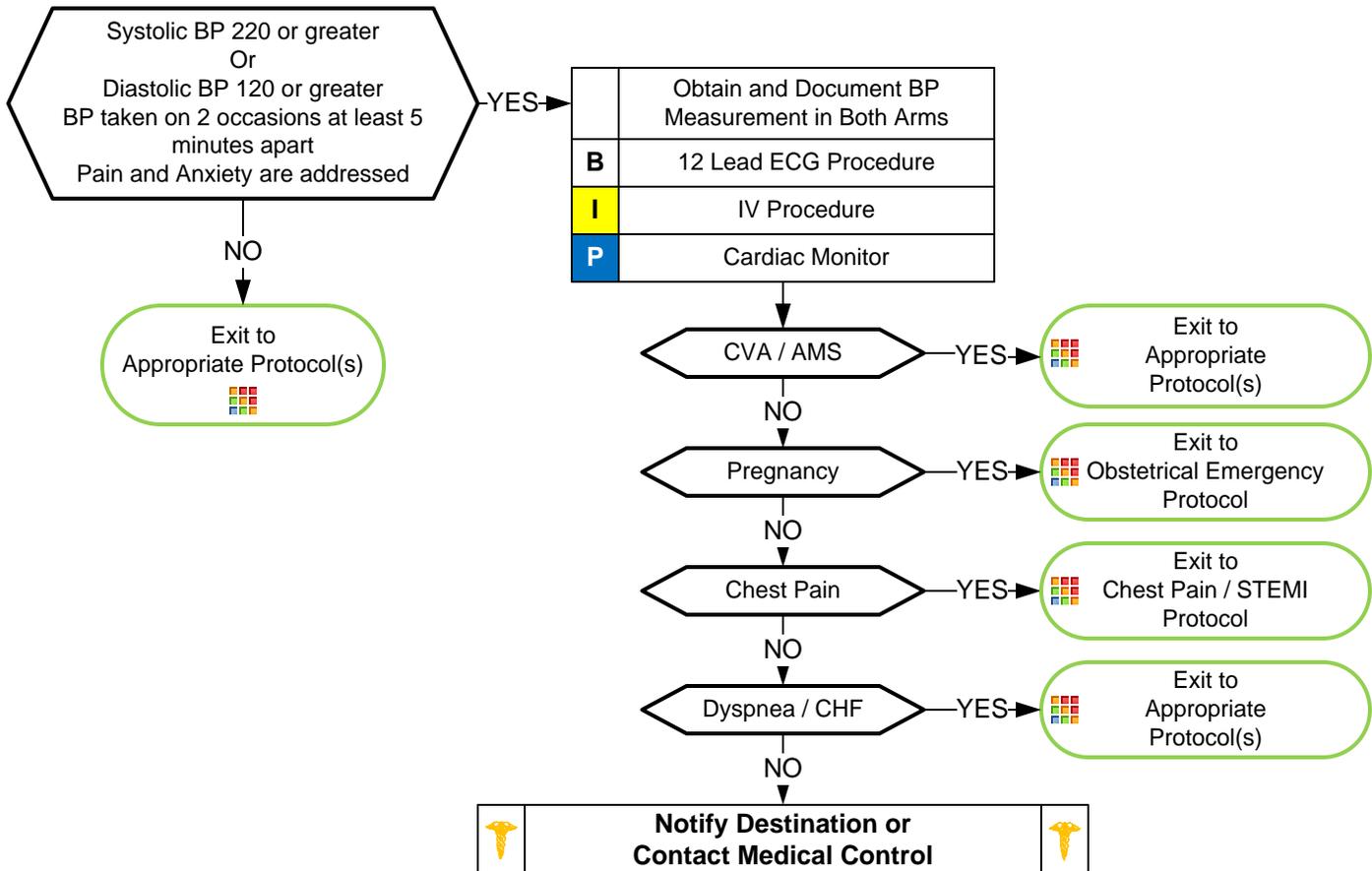
AND at least one of these

- Headache
- Chest Pain
- Dyspnea
- Altered Mental Status
- Seizure

Differential

- Hypertensive encephalopathy
- Primary CNS Injury
Cushing's Response with Bradycardia and Hypertension
- Myocardial Infarction
- Aortic Dissection / Aneurysm
- Pre-eclampsia / Eclampsia

Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on specific protocols and consultation with Medical Control.



Adult Medical Section Protocols

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Elevated blood pressure is based on two to three sets of vital signs.
- Symptomatic hypertension is typically revealed through end organ dysfunction to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated at 30 degrees.
- Ensure appropriate size blood pressure cuff utilized for body habitus.

Hypotension / Shock

History

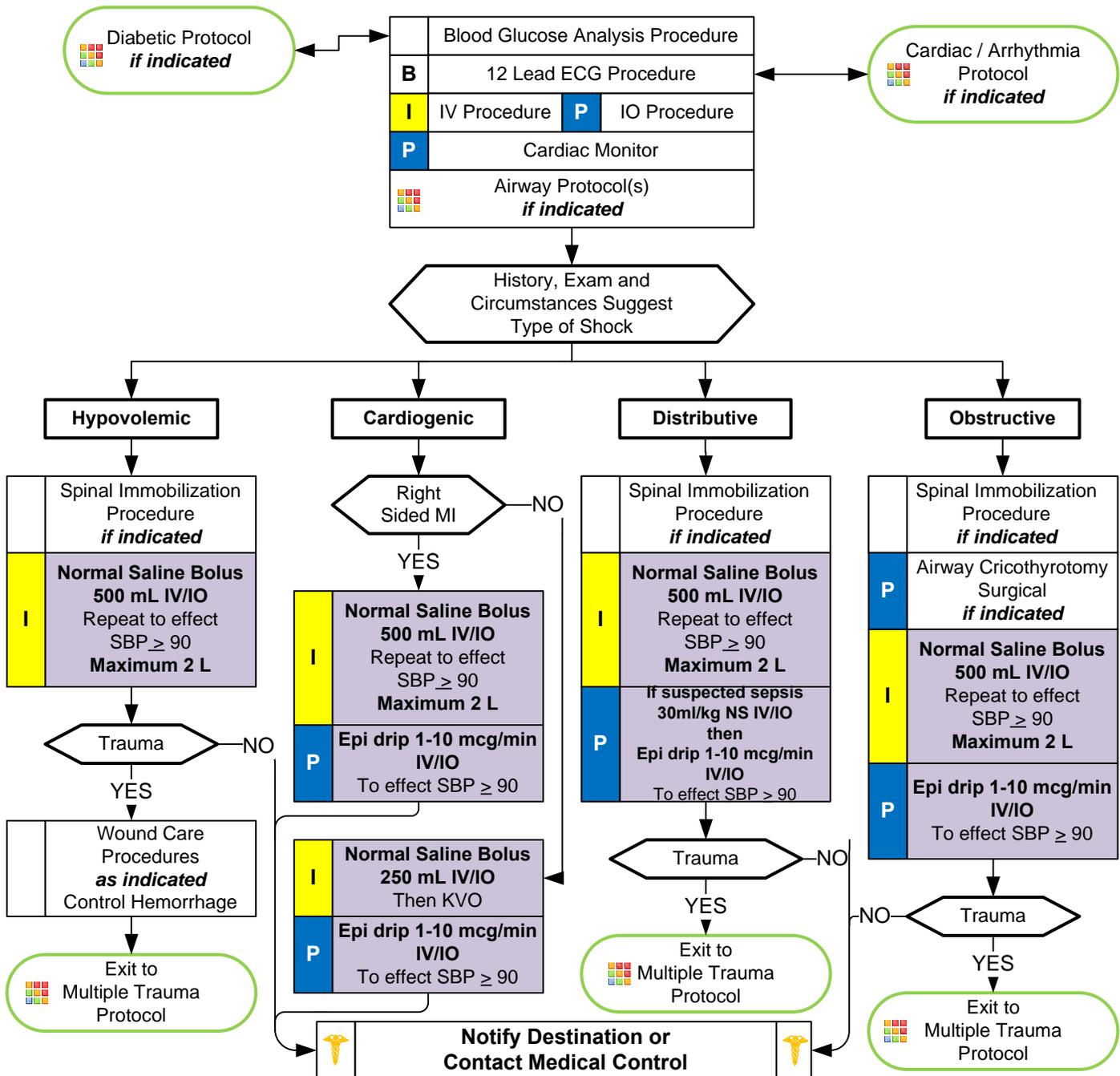
- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms

- Restlessness, confusion
- 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
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)



Hypotension / Shock



Septic Shock

Skin – Varies from flushed pink (if fever is present) to pale and cyanotic, possible petechia, possible purple blotches, possible peeling (general or at palms and soles), red streaks progressing proximally

Blood Pressure – Early: cardiac output increases but toxins may cause loss of peripheral vascular resistance

Blood Pressure – Late: Hypotension; precipitous fall in blood pressure

Respiration – Dyspnea with altered lung sounds

Other – Possible high fever (except some elderly and very young patients),

Other – Late: frank pulmonary edema

Septic shock is the result of an overwhelming infection. Sepsis may not be noticed for some time and may be confused with a wide variety of other conditions. Sepsis begins with an infection that sets in motion an overwhelming systemic response from the immune system, the end results of which are hypotension, hypoperfusion, and end organ dysfunction. The infection can be caused by bacteria, fungus, and some viruses. Gram-negative bacteremia is more likely to cause sepsis (50 percent of infections) compared to gram-positive bacteremia (25 percent of infections). The inflammatory and cellular events are complex and significant. Organisms invade the body through the bloodstream or locally. In either case, the organisms release structural components (commonly referred to as toxins, either endotoxins or exotoxins) that trigger our natural immune system to release its own endogenous mediators (e.g., cytokines from monocytes and prostaglandins from neutrophils, along with histamine, heparin, tumor necrosis factor [TNF], and others).

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Hypotension can be defined as a systolic blood pressure of less than 90. This is not always reliable and should be interpreted in context and patients typical BP if known. Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Hypovolemic Shock:**
Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
- **Cardiogenic Shock:**
Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventricular / septum / valve / toxins.
- **Distributive Shock:**
Sepsis
Anaphylactic
Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
Toxins
- **Obstructive Shock:**
Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency:** State where body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary adrenal disease or more commonly have stopped a steroid like prednisone. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. If suspected EMT-P should give Methylprednisolone 125 mg IV / IO or Dexamethasone 10 mg IV / IO. May use steroid agent specific to your drug list.
- For non-cardiac, non-trauma hypotension, Dopamine should only be started after 2 liters of NS have been given.

Overdose / Toxic Ingestion

History

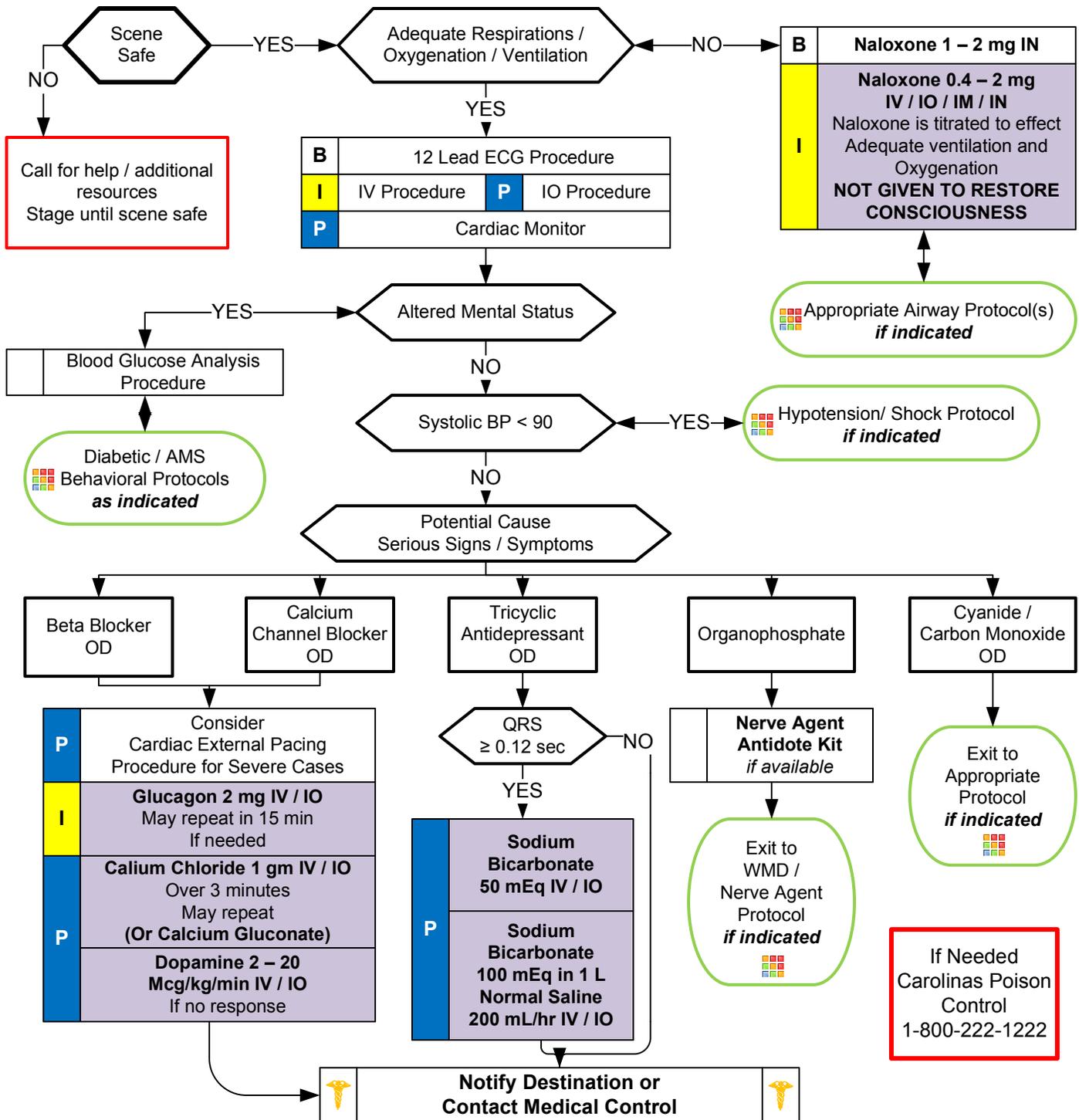
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

Signs and Symptoms

- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S

Differential

- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)



Overdose / Toxic Ingestion

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons.**
- **Bring bottles, contents, emesis to ED.**
- **S.L.U.D.G.E: Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis**
- **D.U.M.B.B.E.L.S: Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.**
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin:** Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **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 changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- **EMT-B may administer naloxone by IN route only. May administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.
- **Consider contacting the North Carolina Poison Control Center for guidance.**

Seizure

History

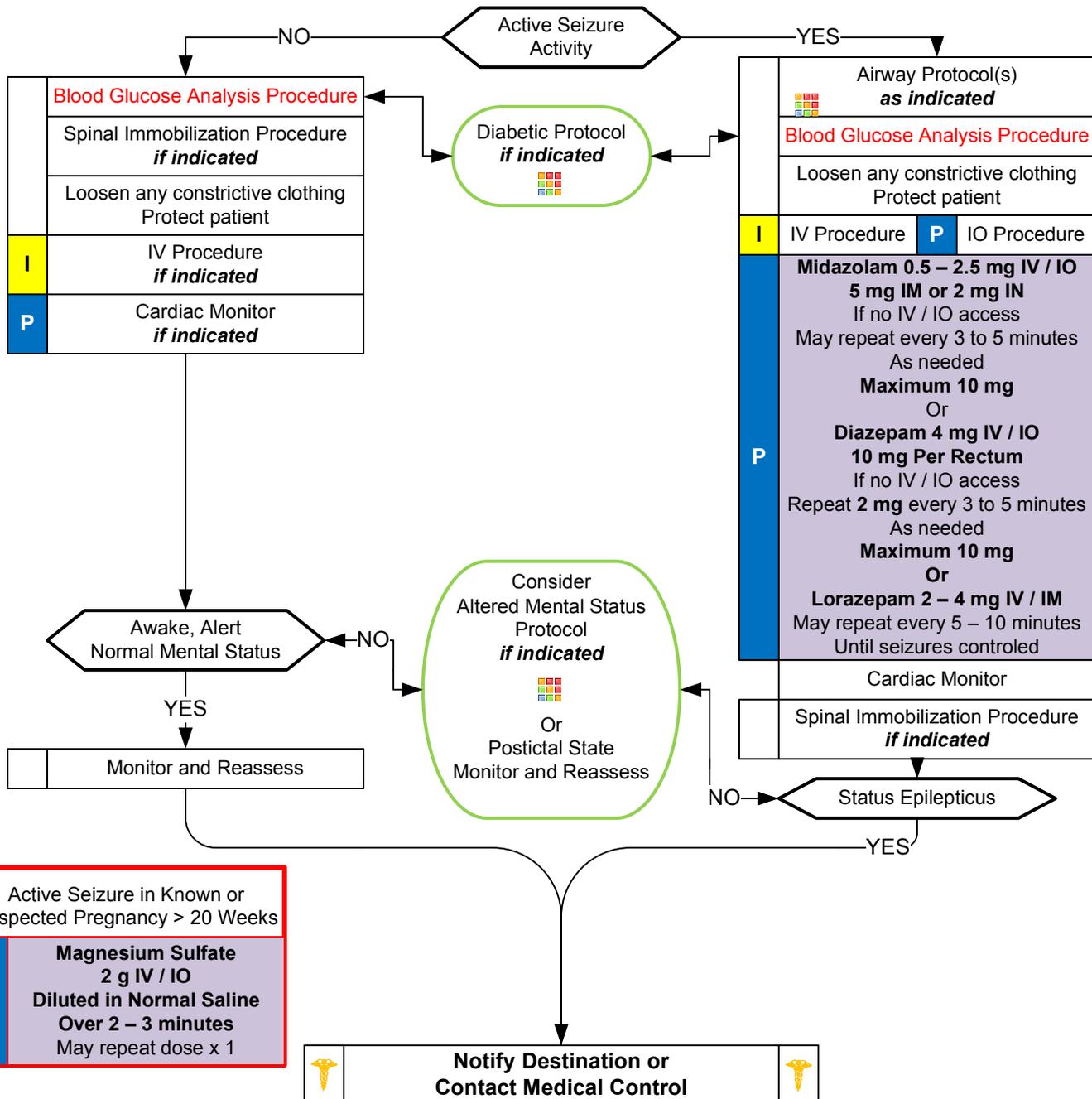
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

Signs and Symptoms

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

Differential

- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia



Seizure

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures (petit mal)** affect only a part of the body and are not usually associated with a loss of consciousness
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations especially if diazepam or midazolam is used.
- For any seizure in a pregnant patient, follow the OB Emergencies Protocol.
- Diazepam (Valium) is not effective when administered IM. Give IV or Rectally. Midazolam is well absorbed when administered IM.

Protocol 32

This protocol has been altered from the original 2012 NCEP Protocol by the local EMS Medical Director

Suspected Stroke

History

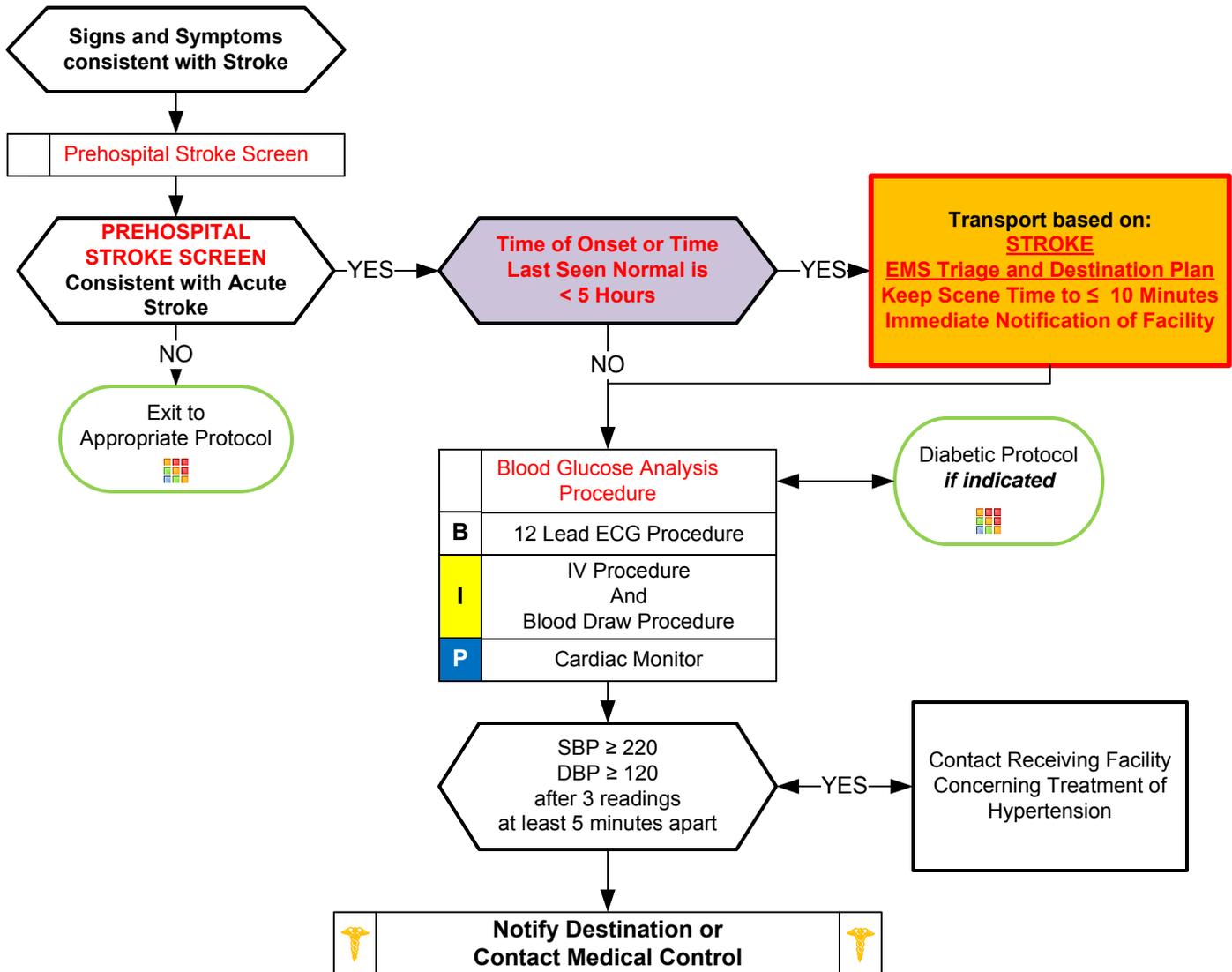
- Previous CVA, TIA's
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

Signs and Symptoms

- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

Differential

- See Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Todd's Paralysis
- Hypoglycemia
- Stroke
 - Thrombotic or Embolic (~85%)
 - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / Renal Failure



Suspected Stroke

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Stroke Care Toolkit.**
- **Acute Stroke care is evolving rapidly. Time of onset / last seen normal may be changed at any time depending on the capabilities and resources of your hospital based on Stroke: EMS Triage and Destination Plan.**
- **Time of Onset or Last Seen Normal: One of the most important items the pre-hospital provider can obtain, of which all treatment decisions are based. Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:47 NOT “about 45 minutes ago.”) Without this information patient may not be able to receive thrombolytics at facility. Wake up stroke: Time starts when patient last awake.**
- **The **Reperfusion Checklist** should be completed for any suspected stroke patient. With a duration of symptoms of less than 5 hours, scene times should be limited to ≤ 10 minutes, early notification / activation of receiving facility should be performed and transport times should be minimized.**
- **Onset of symptoms** is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time when the patient went to sleep or last time known to be symptom free.)
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- Document the Stroke Screen results in the PCR.
- Agencies may use validated pre-hospital stroke screen of choice.

Syncope / Near Syncope

History

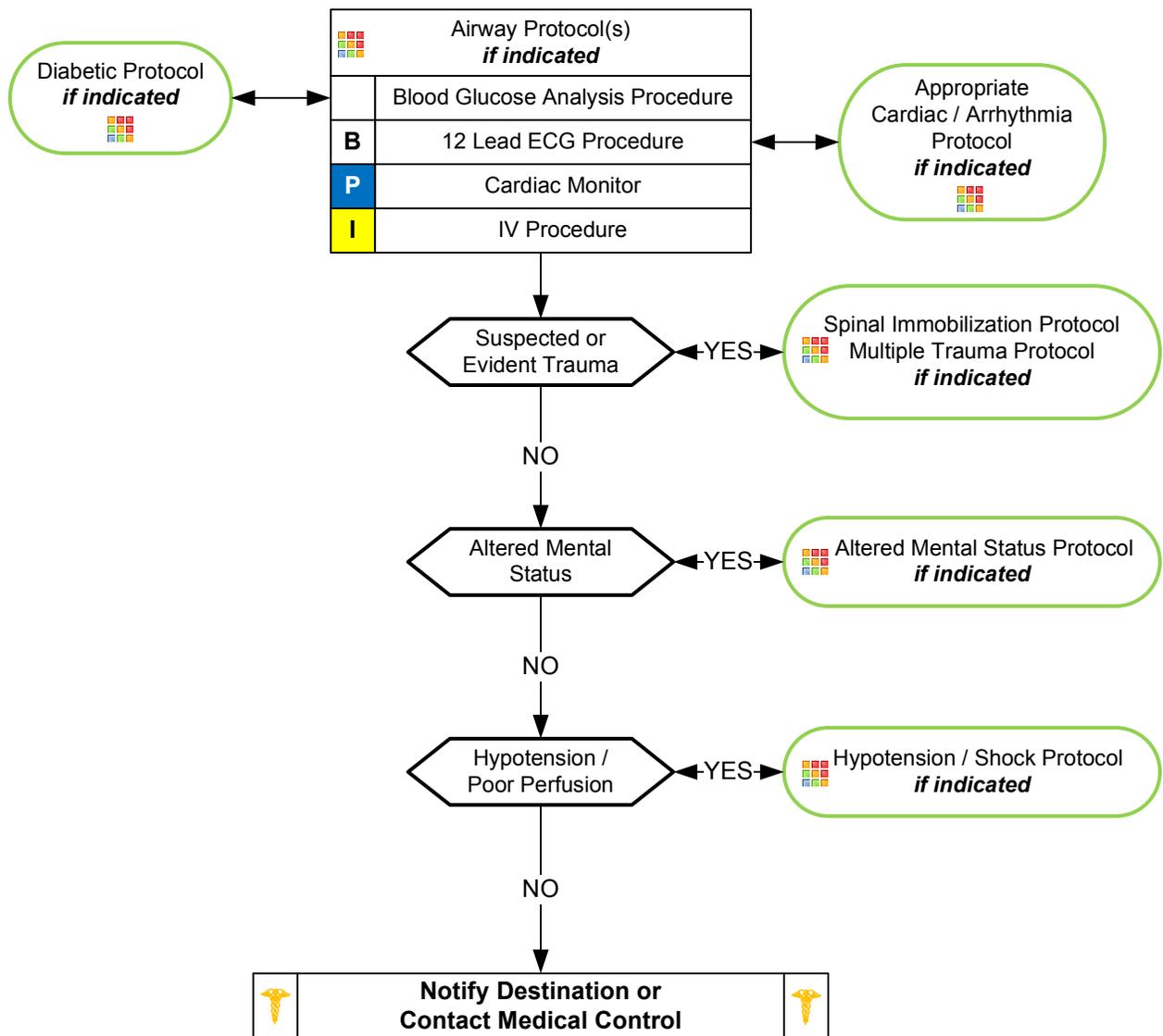
- Cardiac history, stroke, seizure
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications

Signs and Symptoms

- Loss of consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

Differential

- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicological (Alcohol)
- Medication effect (hypertension)
- PE
- AAA



Syncope

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Assess for signs and symptoms of trauma if associated or questionable fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- These patients should be transported.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.

Protocol 34

This protocol has been altered from the original 2012 NCEP Protocol by the local EMS Medical Director

Vomiting and Diarrhea

History

- Age
- Time of last meal
- Last bowel movement/emesis
- Improvement or worsening with food or activity
- Duration of problem
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history (pregnancy)
- Travel history
- Bloody emesis / diarrhea

Signs and Symptoms

- Pain
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

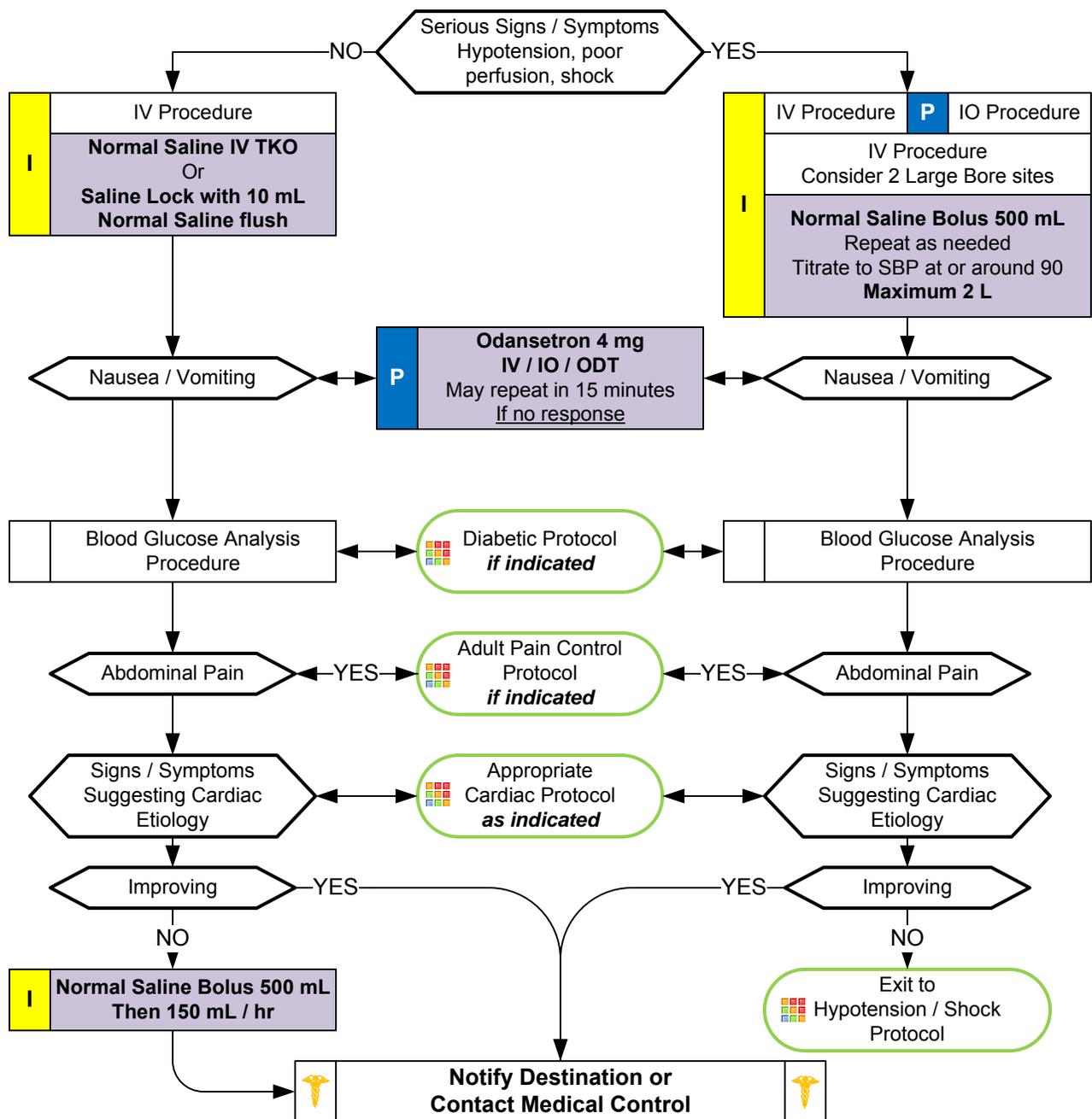
Associated symptoms:

(Helpful to localize source)

Fever, headache, blurred vision, weakness, malaise, myalgias, cough, headache, dysuria, mental status changes, rash

Differential

- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or Substance abuse
- Pregnancy
- Psychological



Protocol 35

Vomiting and Diarrhea

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- The use of metoclopramide (Reglan) may worsen diarrhea and should be avoided in patients with this symptom.
- Choose the lower dose of promethazine (Phenergan) for patients likely to experience sedative effects (e.g., Age ≥ 60, debilitated, etc.) When giving promethazine IV dilute with 10 mL of normal saline and administer slowly.
- Document the mental status and vital signs prior to administration of Promethazine (Phenergan).
- Isolated vomiting in pediatrics may be caused by pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures).

Protocol 35

This protocol has been altered from the original 2012 NCCEP Protocol by the local EMS Medical Director

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Childbirth / Labor

History

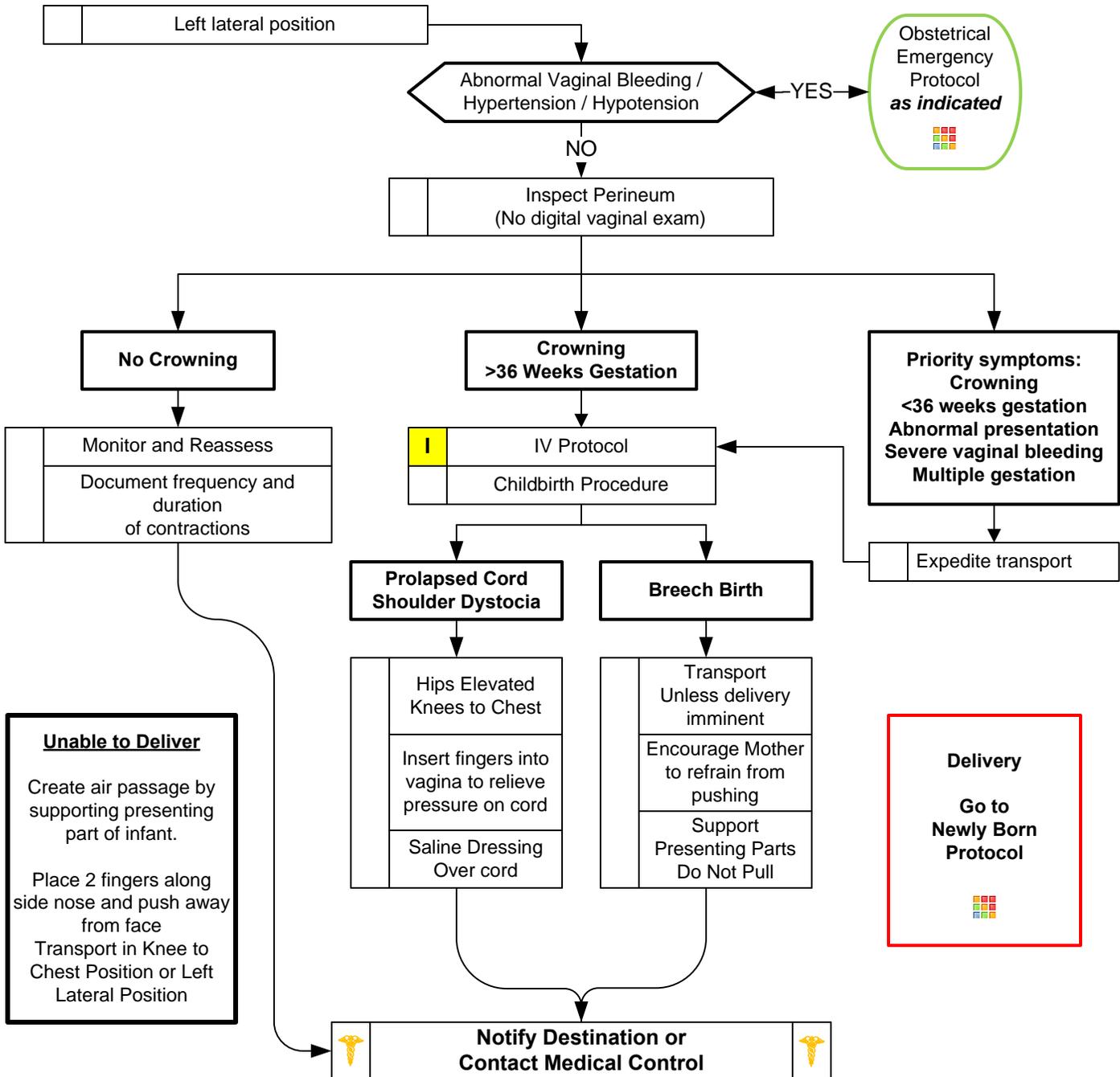
- Due date
- Time contractions started / how often
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para Status
- High Risk pregnancy

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



Childbirth / Labor

Pearls

- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
- Document all times (delivery, contraction frequency, and length).
- If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.
- Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
- Record APGAR at 1 minute and 5 minutes after birth.



Newly Born



History

- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium
- Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors
 - substance abuse
 - smoking

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

Care of mother
Appropriate Protocol



Term Gestation
Breathing or Crying
Good Muscle Tone

YES

Provide warmth / Dry infant
Clear airway if necessary

Monitor and Reassess

NO

Warm, Dry and Stimulate
Clear airway if necessary

Heart Rate < 100
Agonal breathing or Apnea

NO

Labored breathing /
Persistent Cyanosis

NO

YES

BVM Ventilations

B Pulse Oximetry

P Cardiac Monitor

YES

Heart Rate < 100

NO

YES

BVM Ventilations

If repeating cycle take corrective action: Change in position or BVM Technique. If no improvement move down algorithm to intubation

Supplemental Oxygen
Maintain SpO₂ ≥ 94 %

Maintain warmth

Monitor and Reassess

NO

Heart Rate < 60

YES

Pediatric Airway Protocol(s)

Chest Compressions

I IV Procedure

P IO Procedure

Most newborns requiring resuscitation will respond to ventilations / BVM, compressions and / or epinephrine.

If not responding consider hypovolemia, pneumothorax and / or hypoglycemia (< 40.)

I Epinephrine 1:10,000
0.01 mg /kg IV / IO
Every 3 to 5 minutes as needed

I Normal Saline Bolus
10 mL / kg IV / IO
May repeat x 1

NO

Heart Rate < 60

YES

Notify Destination or
Contact Medical Control

Airway Suctioning
Routine suctioning of the newborn is no longer recommended

Clear amniotic fluid:
Suction only when obstruction is present and / or if BVM is needed.

Meconium present:
Non-vigorous newborns may undergo:

I Direct Endotracheal Suctioning



Newly Born



Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- **Term gestation, strong cry / breathing and with good muscle tone generally will need no resuscitation.**
- **Most important vital signs in the newly born are respirations / respiratory effort and heart rate.**
- Heart rate best assessed by auscultation of the precordial pulse followed palpation of the umbilical pulse.
- Pulse oximetry should be applied to the right side of the body.
- **Expected pulse oximetry readings:** Following birth at 1 minute = 60 - 65 %, 2 minutes = 65 – 70%, 3 minutes = 70 – 75 %, 4 minutes = 75 – 80 %, 5 minutes = 80 – 85 % and 10 minutes = 85 – 95%.
- CPR in infants is 120 compressions/minute with a 3:1 compression to ventilation ratio.
- It is extremely important to keep infant warm
- Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended-supportive care only).
- Consider hypoglycemia in infant.
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)
- Document 1 and 5 minute Apgars in PCR



Obstetrical Emergency



History

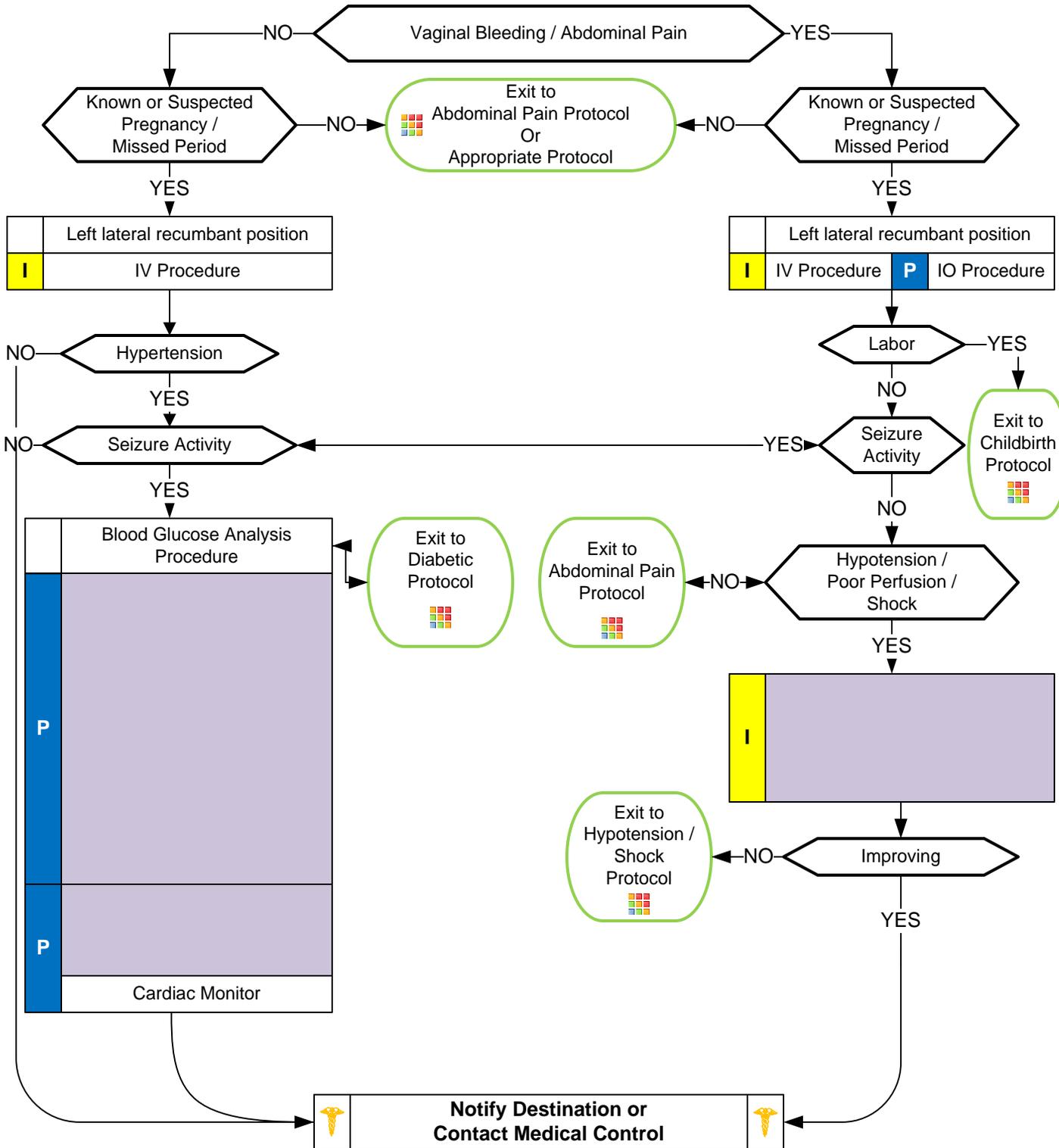
- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

Signs and Symptoms

- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of hands and face

Differential

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



Adult Obstetric Section Protocols



Obstetrical Emergency



Pearls

- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- Severe headache, vision changes, or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Maintain patient in a left lateral position to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require 4 to 6 hours of fetal monitoring. DO NOT suggest the patient needs an ultrasound.
- Magnesium may cause hypotension and decreased respiratory drive. Use with caution.
- **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access.**

Adult Thermal Burn

History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assess Burn / Concomitant Injury Severity

Minor Burn

Serious Burn

Critical Burn

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated, Normotensive GCS 14 or Greater

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring intubation for airway stabilization Hypotension or GCS 13 or Less (When reasonably accessible, transport to a Burn Center)

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma Burns with definitive airway compromise (When reasonably accessible, transport to a Burn Center)

Remove Rings, Bracelets / Constricting Items

Dry Clean Sheet or Dressings

Adult Multiple Trauma Protocol *if indicated*

Adult Airway Protocol(s) *as indicated*

IV Procedure *if indicated*

Normal Saline
0.25 mL / kg (x % TBSA) / hr
for up to the first 8 hours.
(More info below)
Lactated Ringers
if available

Adult Pain Control Protocol *if indicated*

Carbon Monoxide / Cyanide Exposure

Transport (refer to):
[EMS Triage and Destination Plan](#)

Remove Rings, Bracelets / Constricting Items

Dry Clean Sheet or Dressings

Adult Multiple Trauma Protocol *if indicated*

Adult Airway Protocol(s) *as indicated*

IV Procedure
Consider 2 IV sites if greater than 15 % TBSA

IO Procedure *if indicated*
Normal Saline
0.25 mL / kg (x % TBSA) / hr
for up to the first 8 hours.
(More info below)
Lactated Ringers *if available*

Adult Pain Control Protocol *if indicated*

Carbon Monoxide / Cyanide Exposure

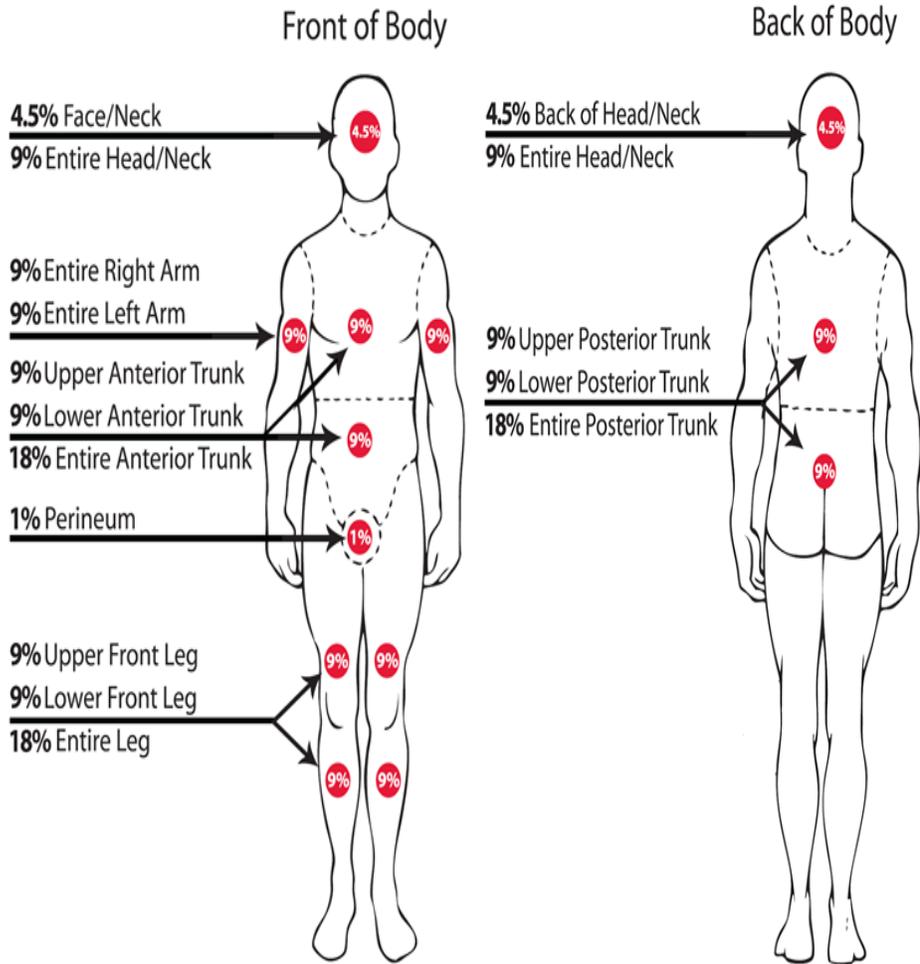
Reduce Scene time when possible and refer to:
[Trauma and Burn: EMS Triage and Destination Plan](#)

Carbon Monoxide / Cyanide Protocol

Notify Destination or Contact Medical Control

1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.
2. Formula example; an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.

Adult Thermal Burn



Estimate spotty areas of burn by using the size of the patient's palm as 1 %

Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burn from those of partial (2nd) or full (3rd) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1st degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th 5th and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns.
- Other burn classifications in general include:
 - 4th referring to a burn that destroys the dermis and involves muscle tissue.
 - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
 - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**
- **Critical or Serious Burns:**
 - > 5-15% total body surface area (TBSA) 2nd or 3rd degree burns, or 3rd degree burns > 5% TBSA for any age group, or circumferential burns of extremities, or electrical or lightning injuries, or suspicion of abuse or neglect, or inhalation injury, or chemical burns, or burns of face, hands, perineum, or feet
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.
- Never administer IM pain injections to a burn patient.

Head Trauma

History

- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

Signs and Symptoms

- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

Differential

- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage or Laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

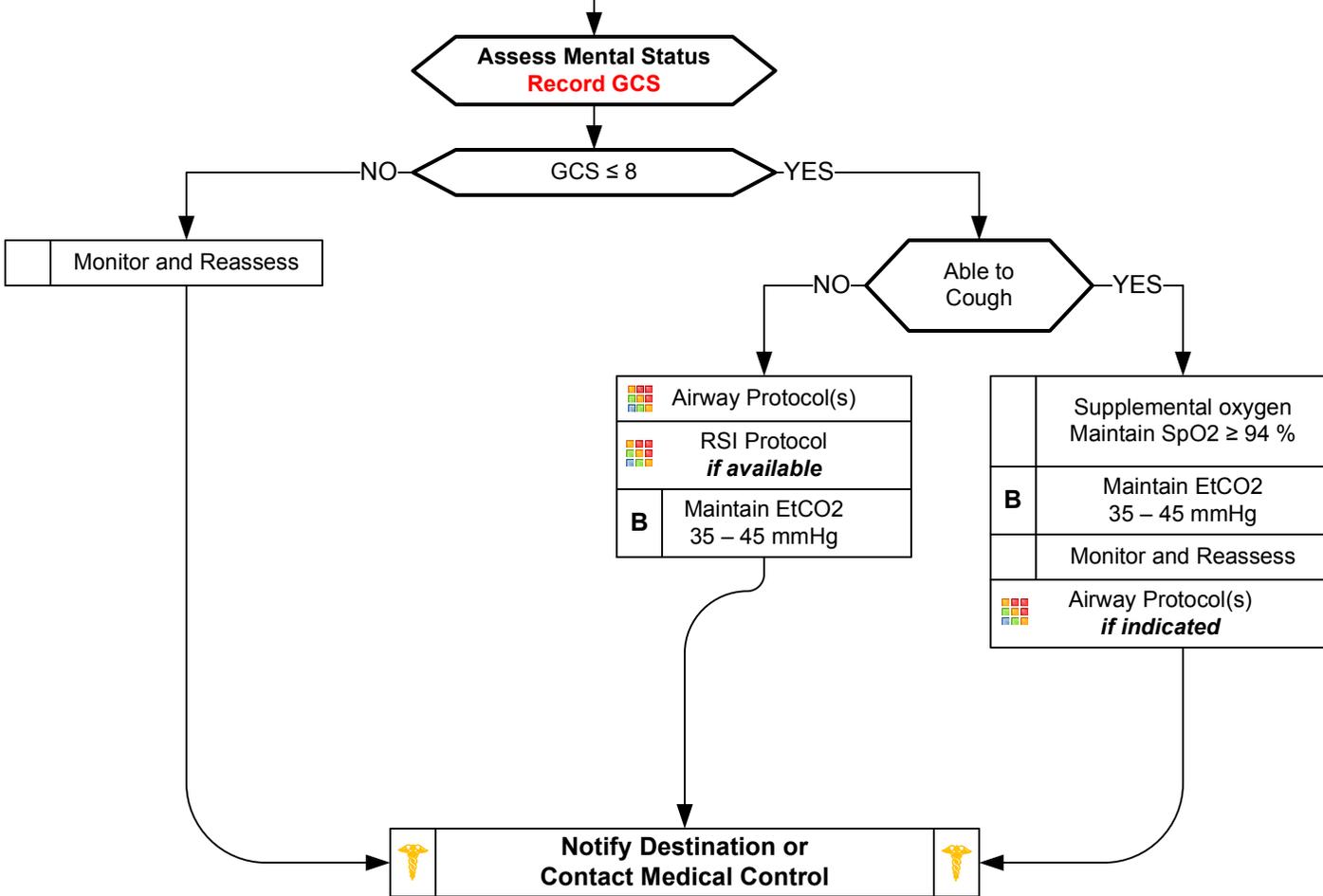
**DO NOT
HYPERVENTILATE**

Ventilate 8 – 10 Breaths
per minute to maintain
EtCO₂ 35 – 45 mmHg

Spinal Motion Restriction Protocol <i>if indicated</i>	
Adult Multiple Trauma Protocol <i>if indicated</i>	
I IV Procedure	P IO Procedure
Altered Mental Status Protocol <i>if indicated</i>	
Seizure Protocol <i>if indicated</i>	
Blood Glucose Analysis Procedure	

Brain Herniation
Unilateral or Bilateral Dilation of
Pupils / Posturing

Hyperventilate 14 – 16 Breaths
per minutes to maintain
EtCO₂ 30 – 35 mmHg



Adult Trauma and Burn Section Protocols

Head Trauma

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **GCS is a key performance measure used in the EMS Acute Trauma Care Toolkit.**
- **If GCS < 12** - Reduce Scene time when possible and refer to EMS Triage and Destination Plan
- **In areas with short transport times, RSI/Drug-Assisted Intubation is not recommended for patients who are spontaneously breathing and who have oxygen saturations of $\geq 90\%$ with supplemental oxygen including BIAD / BVM.**
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- Limit IV fluids unless patient is hypotensive.
- Concussions are traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache. Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.

Protocol 41

This protocol has been altered from the original 2012 NCEP Protocol by the local EMS Medical Director



Multiple Trauma



History

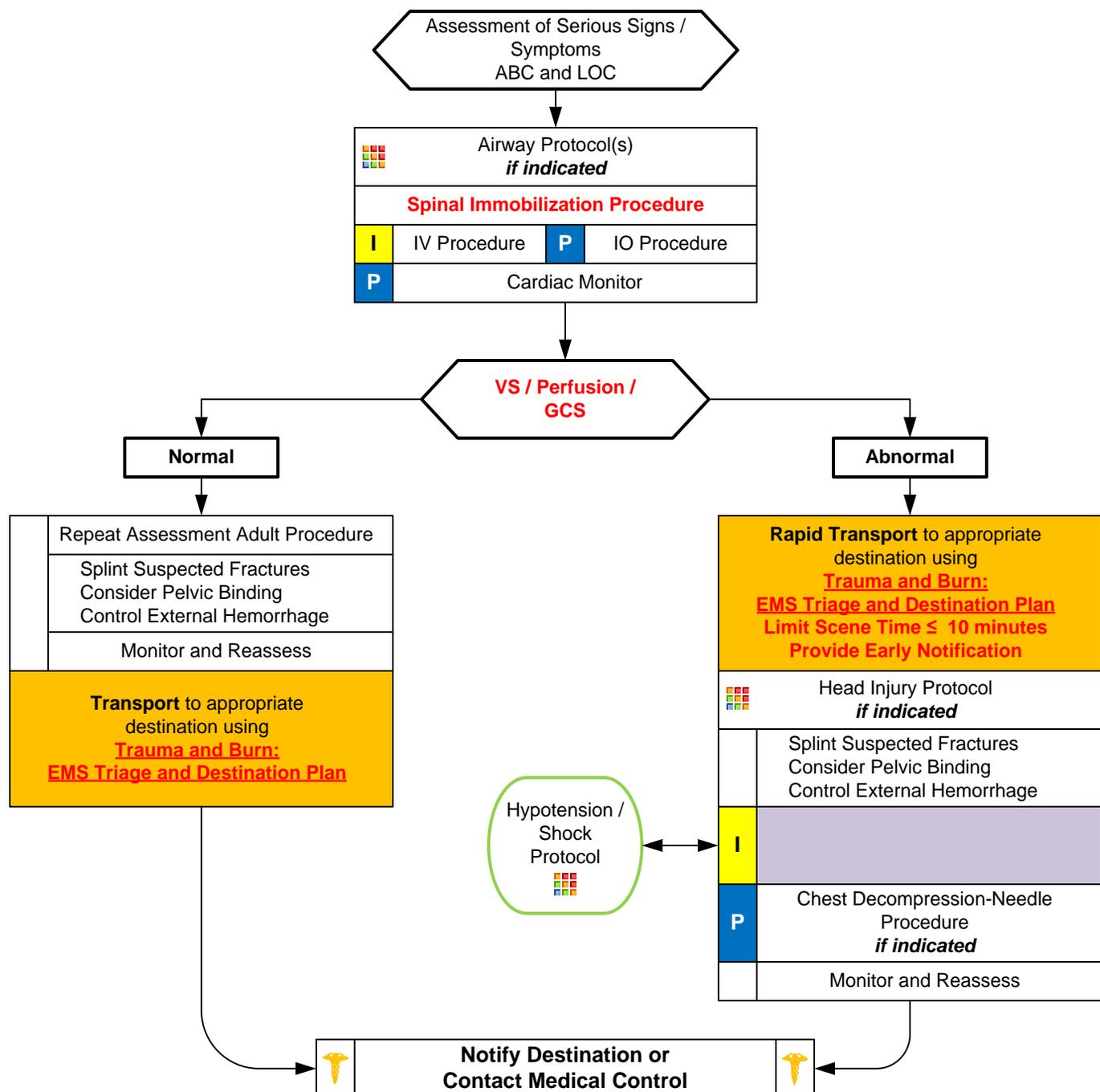
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

Signs and Symptoms

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential (Life threatening)

- Chest: Tension pneumothorax
Flail chest
Pericardial tamponade
Open chest wound
Hemothorax
- Intra-abdominal bleeding
- Pelvis / Femur fracture
- Spine fracture / Cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia



Adult Trauma and Burn Section Protocols



Multiple Trauma



Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- **Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained $\geq 90\%$**
- Geriatric patients should be evaluated with a high index of suspicion. Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning.
- Mechanism is the most reliable indicator of serious injury.
- In prolonged extrications or serious trauma, consider air transportation for transport times and the ability to give blood.
- Do not overlook the possibility of associated domestic violence or abuse.

Protocol 42

Blank

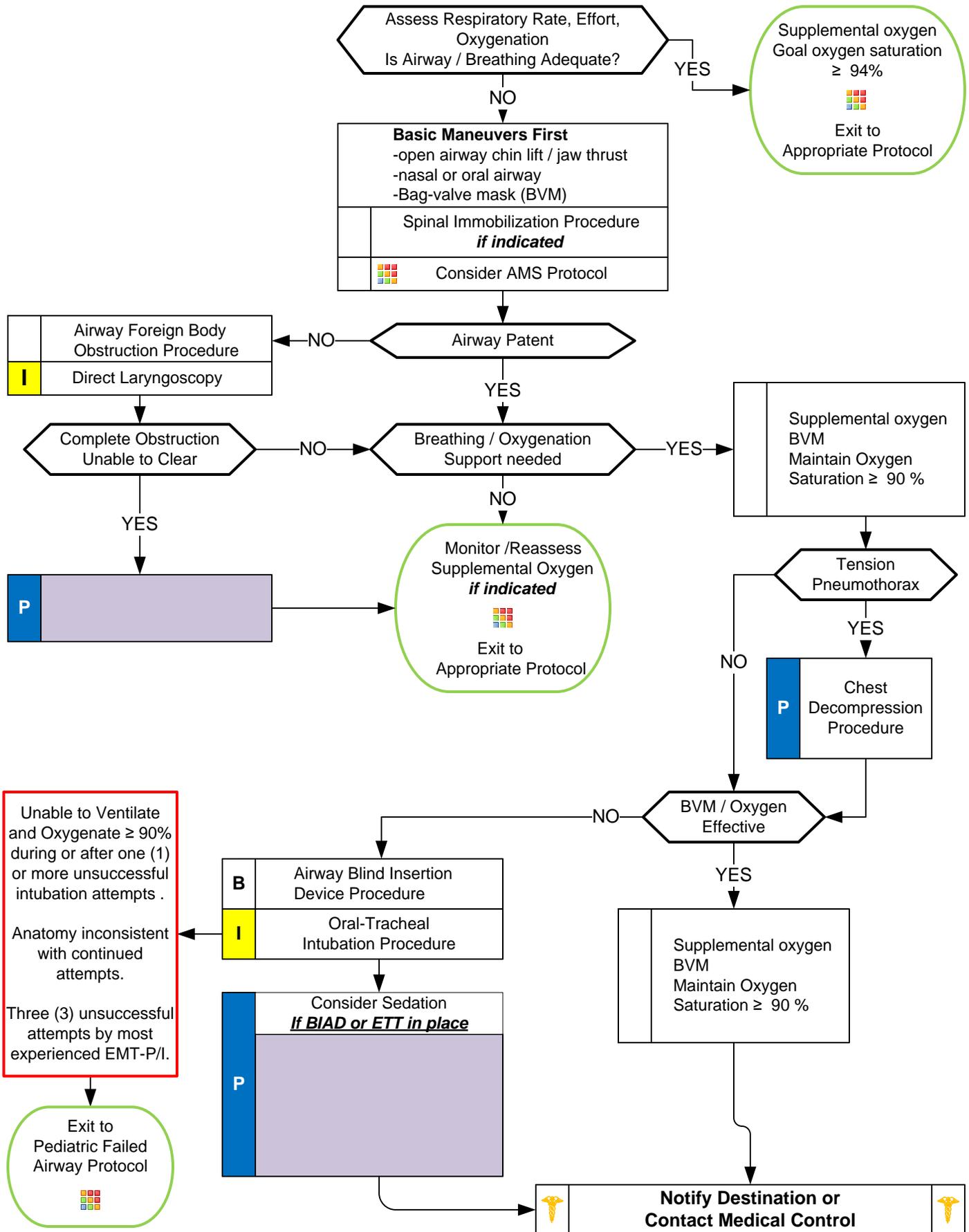
This protocol is intentionally left blank for future expansion



Pediatric Airway



Pediatric General Section Protocols



Unable to Ventilate and Oxygenate $\geq 90\%$ during or after one (1) or more unsuccessful intubation attempts .

Anatomy inconsistent with continued attempts.

Three (3) unsuccessful attempts by most experienced EMT-P/I.

Exit to Pediatric Failed Airway Protocol



Pediatric Airway



Pearls

- For this protocol, pediatric is defined as less than ≤ 11 years of age or any patient which can be measured within the Broselow-Luten tape.
- Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.
- Continuous capnography (EtCO₂) is strongly recommended with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of $\geq 90\%$, it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.
- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.
- Ventilatory rate should be 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 12 per minute. Maintain a EtCO₂ between 35 and 45 and avoid hyperventilation.
- Hyperventilation in deteriorating head trauma should only be done to maintain a pCO₂ of 30-35.
- It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.
- Do not attempt intubation in patients who maintain a gag reflex.
- Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- Cricoid pressure and BURP maneuver may be used to assist with difficult intubations. They may worsen view in some cases.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **Airway Cricothyrotomy Needle Procedure:**
 - Indicated as a lifesaving / last resort procedure in pediatric patients ≤ 11 years of age.
 - Very little evidence to support it's use and safety.
 - A variety of alternative pediatric airway devices now available make the use of this procedure rare.
 - Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.



Pediatric Failed Airway

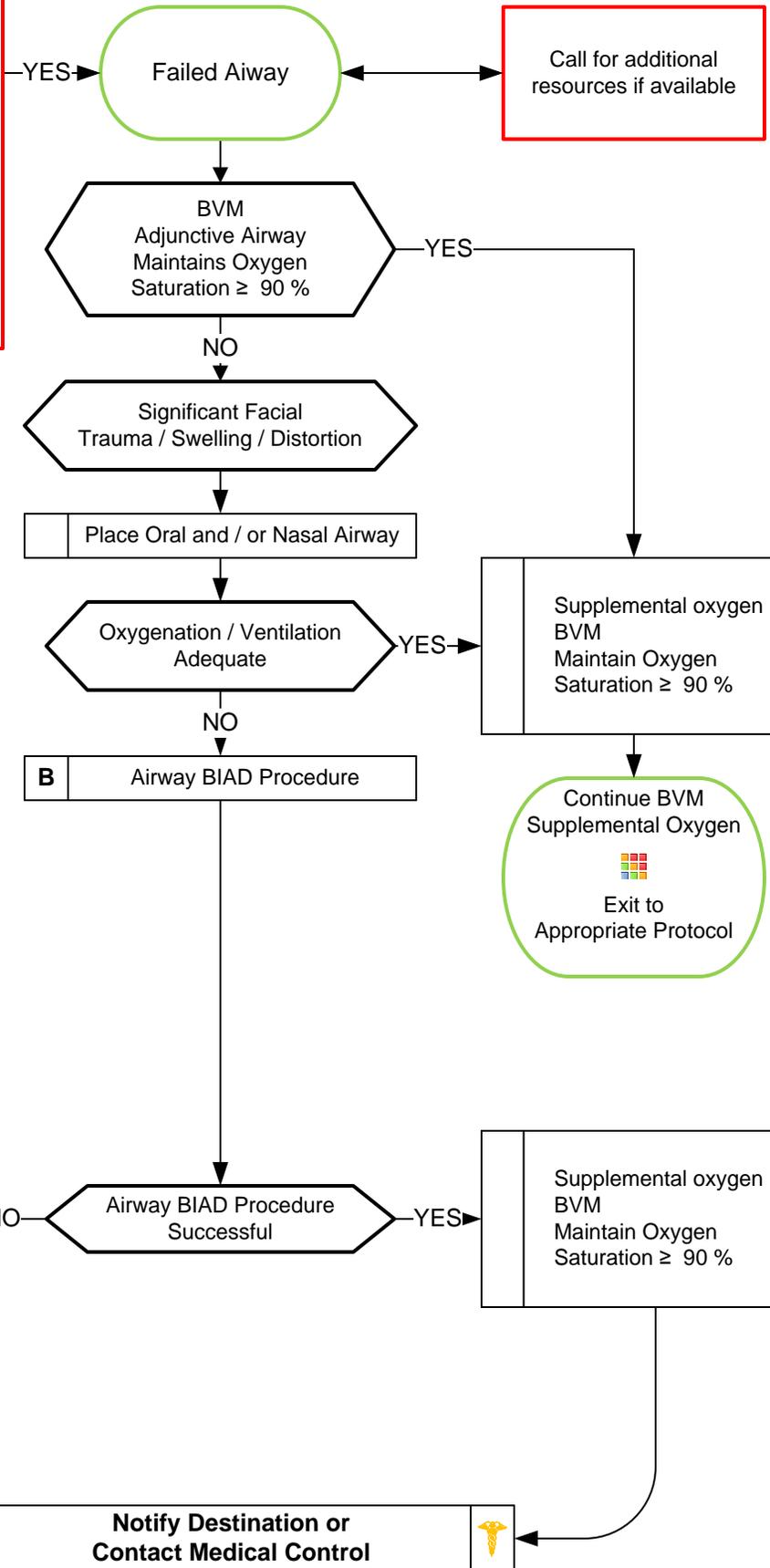


Unable to Ventilate and Oxygenate $\geq 90\%$ during or after one (1) or more unsuccessful intubation attempts .

Anatomy inconsistent with continued attempts.

Three (3) unsuccessful attempts by most experienced EMT-P/I.
Each attempt should include change in approach or equipment

NO MORE THAN THREE (3) ATTEMPTS TOTAL



Pediatric General Section Protocols

P	
	Supplemental oxygen BVM Maintain Oxygen Saturation $\geq 90\%$

Notify Destination or Contact Medical Control



Pediatric Failed Airway



Pearls

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- Hyperventilation in deteriorating head trauma should only be done to maintain a pCO₂ of 30-35.
- It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.
- If first intubation attempt fails, make an adjustment and then try again: Different laryngoscope blade; Gum Elastic Bougie; Different ETT size; Change cricoid pressure; Apply BURP; Change head positioning
- Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- Cricoid pressure and BURP maneuver may be used to assist with difficult intubations. They may worsen view in some cases.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
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Pediatric Pain Control

History

- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms

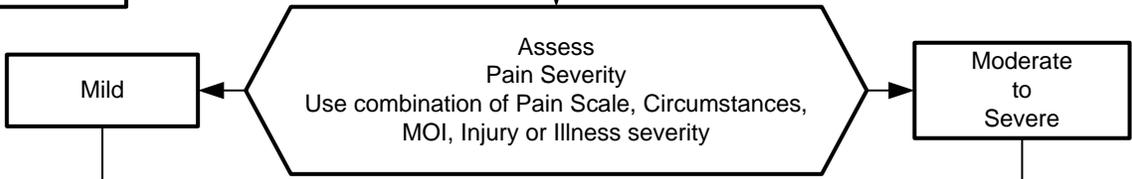
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

Differential

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

Allow for position of maximum comfort unless contraindicated

Enter from Protocol based on Specific Complaint



B	Ibuprofen 10 mg / kg PO Maximum dose 800 mg Or Acetaminophen 15 mg / kg PO Maximum dose 1000 mg
I	Consider IV Procedure <i>if indicated</i>
	Monitor and Reassess every 5 minutes

I	IV Procedure P IO Procedure
	Ketorolac 0.5 mg / kg IV / IO / IM Maximum dose 30 mg
	Cardiac Monitor
P	Morphine Sulfate 0.1 mg / kg IV / IO / IM May repeat every 5 minutes as needed for pain control up to Maximum total dose 10 mg Maximum single dose 5 mg Or Fentanyl 1 mcg/kg IN/IM/IV/IO May repeat 0.5 mcg/kg every 5 minutes Maximum dose 2mcg/kg
	Monitor and Reassess Every 5 minutes following sedative

Notify Destination or Contact Medical Control

Pediatric General Section Protocols

Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.
- For children use Wong-Baker faces scale or the FLACC score (see Assessment Pain Procedure)
- Vital signs should be obtained pre, 5 minutes post, and at disposition with all pain medications.
- Contraindications to Narcotic use include hypotension, head injury, or respiratory distress.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- **Ibuprofen / Ketorolac** should not be given if there is abdominal pain, history of gastritis, stomach ulcers, fracture, or if patient will require sedation.
- Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities.
- Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain
- Consider agency-specific anti-emetic(s) for nausea and/or vomiting.

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This protocol is intentionally left blank for future expansion

Pediatric Non-Shockable Arrest

History

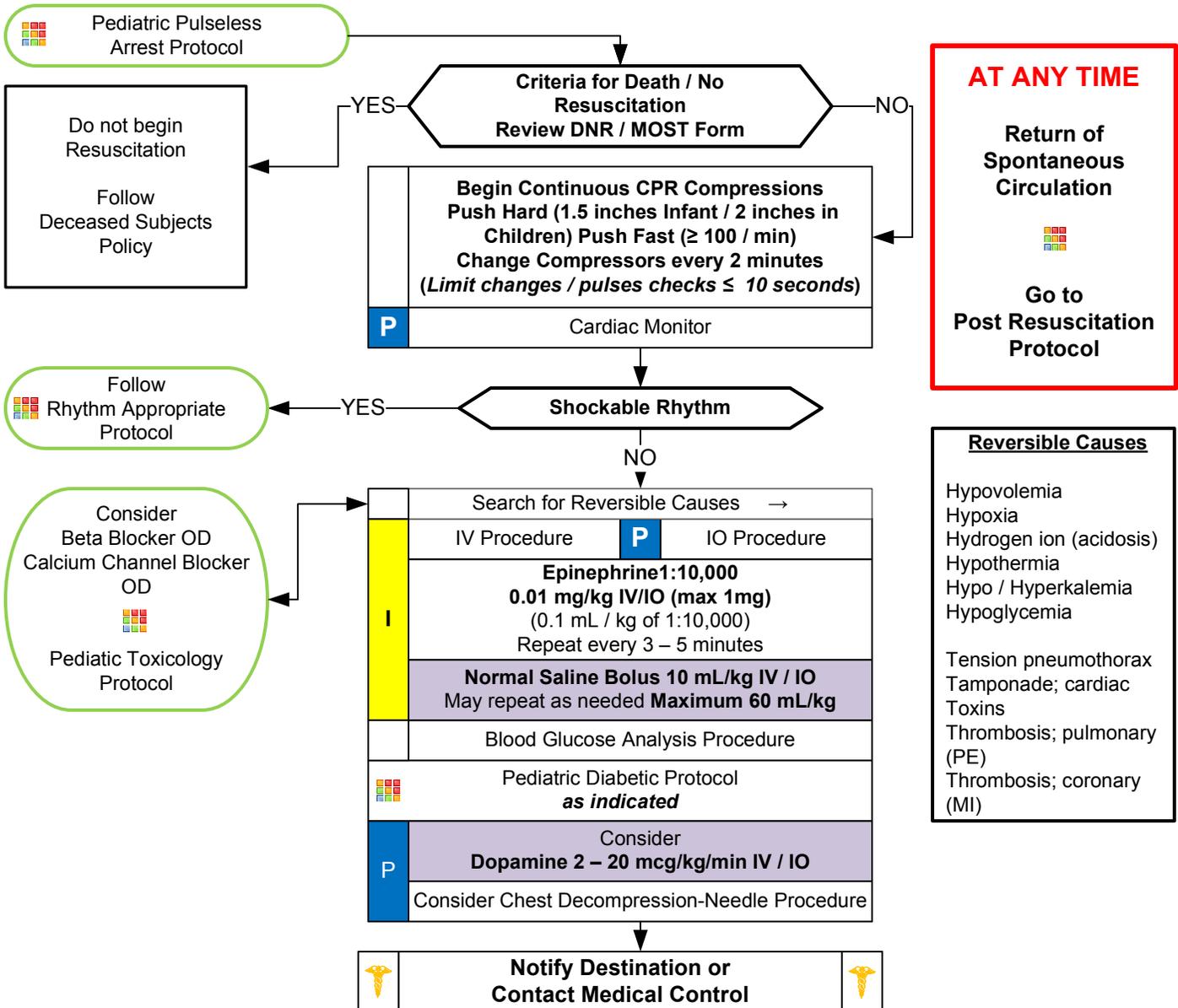
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse; shaken baby syndrome, pattern of injuries
- SIDS

Signs and Symptoms

- Unresponsive
- Cardiac Arrest
- Signs of lividity or rigor

Differential

- Respiratory failure
- Foreign body
- Hyperkalemia
- Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis



Pediatric Cardiac Section Protocols

Pearls

- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults early airway intervention is critical.
- In most cases pediatric airways can be managed by basic interventions.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (**Maximum 10 mg**)

Protocol 48

This protocol has been altered from the original 2012 NCEP Protocol by the local EMS Medical Director

2012

History

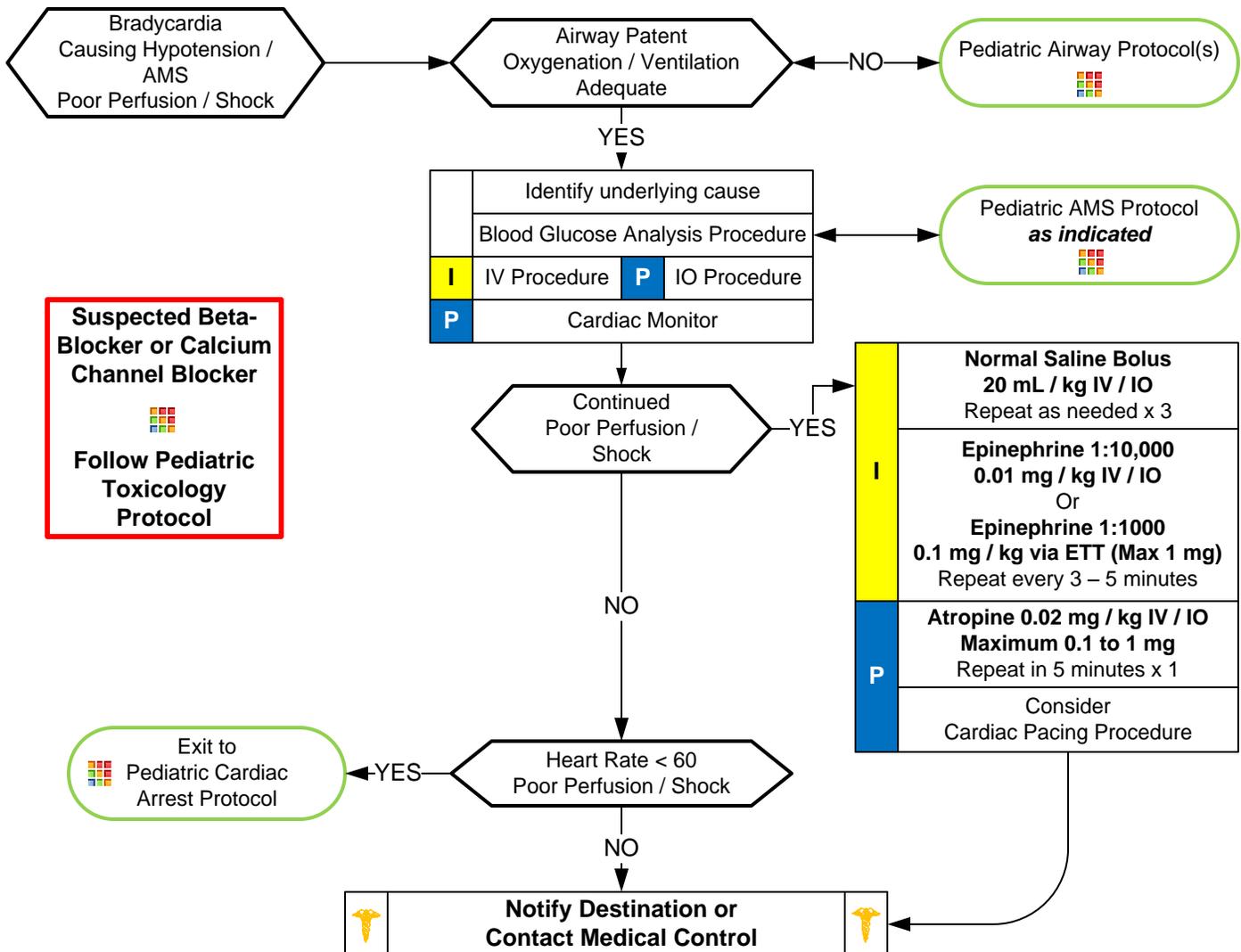
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

Signs and Symptoms

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

Differential

- Respiratory failure
 - Foreign body
 - Secretions
 - Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis



Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Use Broselow-Luten Tape for drug dosages if applicable.**
- Infant \leq 1 year of age
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers guidelines.
- Minimum Atropine dose is 0.1 mg IV.

Pediatric Pulmonary Edema / CHF

History

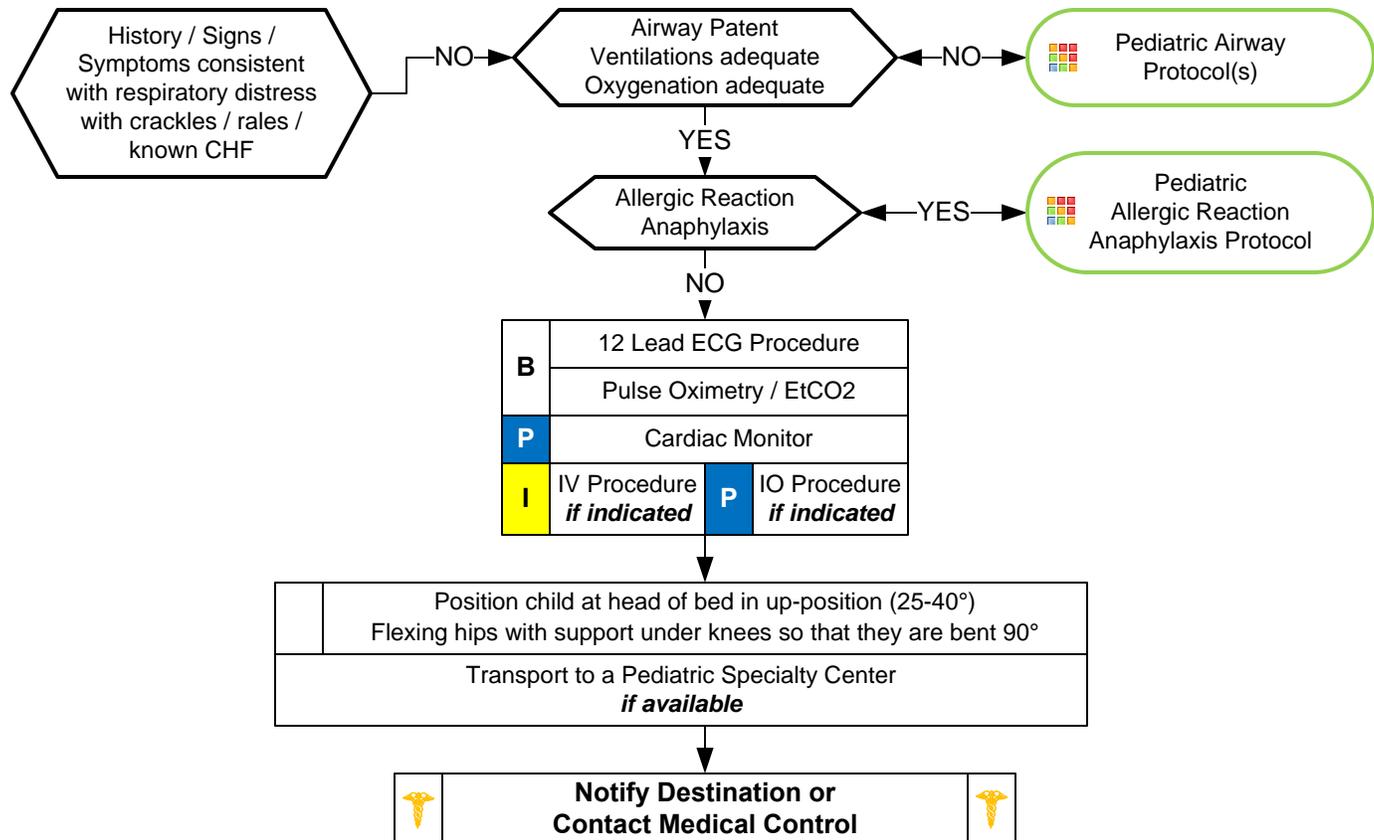
- Congenital Heart Disease
- Chronic Lung Disease
- Congestive heart failure
- Past medical history

Signs/Symptoms

- Infant: Respiratory distress, poor feeding, lethargy, weight gain, +/- cyanosis
- Child/Adolescent: Respiratory distress, bilateral rales, apprehension, orthopnea, jugular vein distention (rare), pink, frothy sputum, peripheral edema, diaphoresis, chest pain
- Hypotension, shock

Differential

- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure



Pearls

- **Recommended exam: Mental status, Respiratory, Cardiac, Skin, Neuro**
- **Contact Medical Control early in the care of the pediatric cardiac patient.**
- **Most children with CHF have a congenital heart defect, obtain a precise past medical history.**
- **Congenital heart disease varies by age:**
 - < 1 month: Tetralogy of Fallot, Transposition of the great arteries, Coarctation of the aorta.
 - 2 – 6 months: Ventricular septal defects (VSD), Atrioseptal defects (ASD).
 - Any age: Myocarditis, Pericarditis, SVT, heart blocks.
- **Treatment of Congestive Heart Failure / Pulmonary edema may vary depending on the underlying cause and may include the following with consultation by Medical Control:**
 - Morphine Sulfate: 0.1 mg/kg IV / IO. Max single dose 5mg/dose**
 - Nitroglycerin: Dose determined after consultation of Medical Control.**
 - Lasix 1 mg/kg IV / IO.**
 - Dopamine 2 – 20 mcg/kg IV / IO. Titrate to age specific systolic blood pressure.**
- Do not assume all wheezing is pulmonary, especially in a cardiac child: avoid albuterol unless strong history of recurrent wheezing secondary to pulmonary etiology (discuss with Medical Control)

Pediatric Pulseless Arrest

History

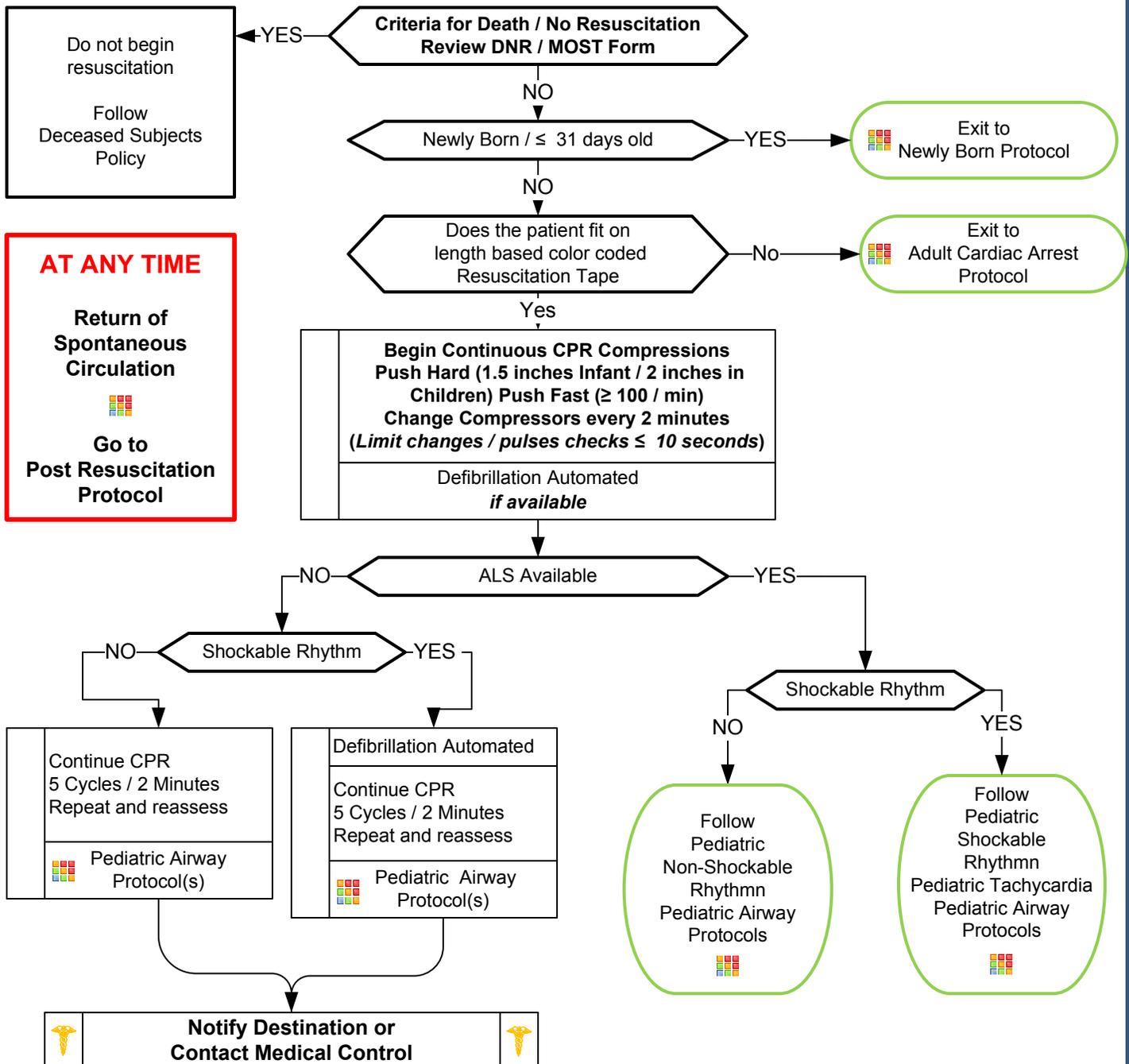
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Hypothermia

Signs and Symptoms

- Unresponsive
- Cardiac arrest

Differential

- Respiratory failure
Foreign body, Secretions, Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, K)
- Acidosis



Pediatric Pulseless Arrest

Pearls

- **Recommended Exam: Mental Status**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress \geq 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or supraglottic device. Patient survival is often dependent on proper ventilation and oxygenation / Airway Interventions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach assigning responders to predetermined tasks.
- Team Focused Approach / Pit-Crew Approach. Refer to optional protocol or development of local agency protocol.
- Reassess and document endotracheal tube placement and EtCO₂ frequently, after every move, and at transfer of care.
- Monophasic and Biphasic waveform defibrillators should use the same energy levels 2 joules / kg and increase to 4 joules / kg on subsequent shocks.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.



Pediatric Tachycardia



History

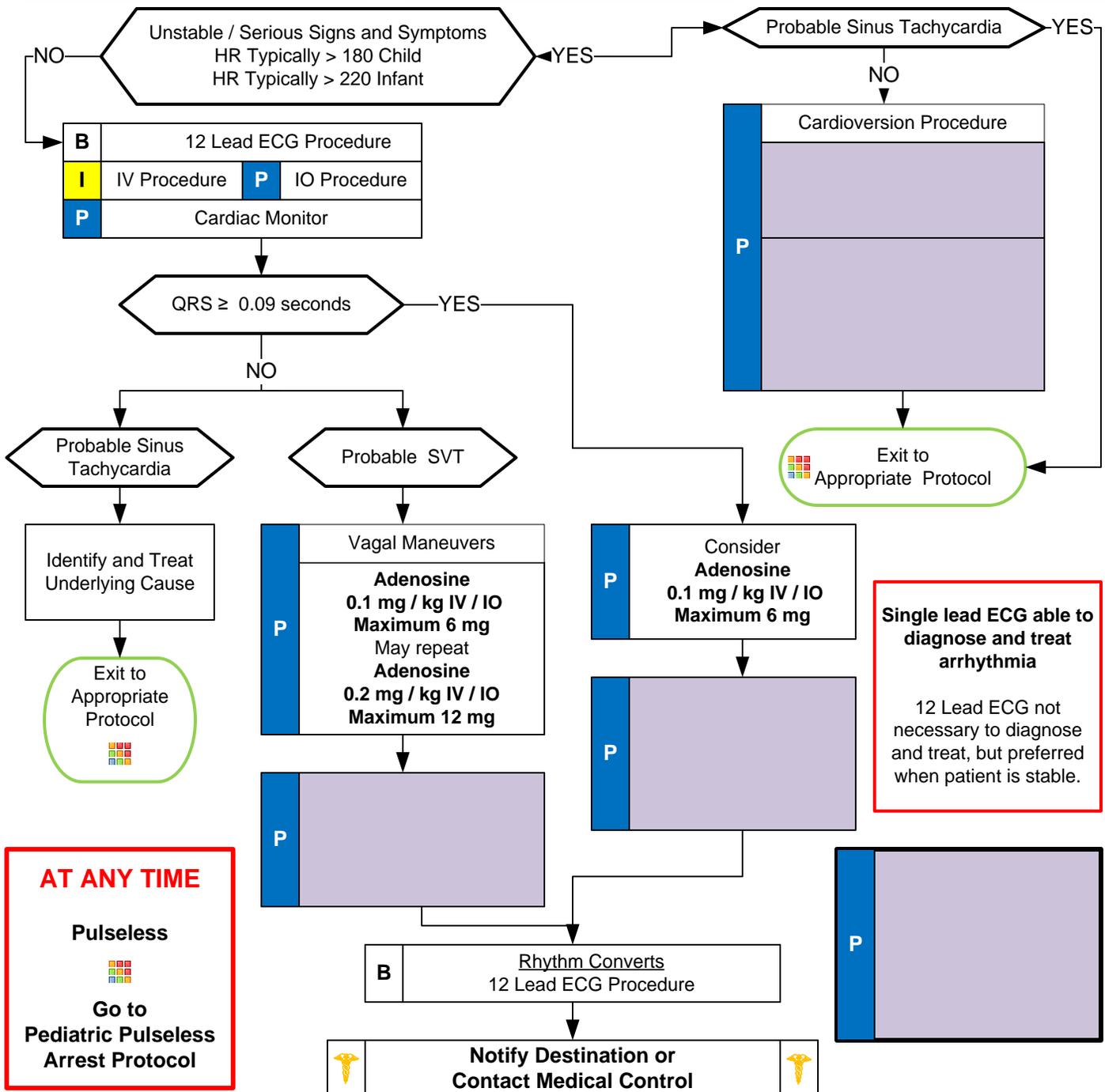
- Past medical history
- Medications or Toxic Ingestion (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Drugs (nicotine, cocaine)
- Congenital Heart Disease
- Respiratory Distress
- Syncope or Near Syncope

Signs and Symptoms

- Heart Rate: Child > 180/bpm
Infant > 220/bpm
- Pale or Cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered Level of Consciousness
- Pulmonary Congestion
- Syncope

Differential

- Heart disease (Congenital)
- Hypo / Hyperthermia
- Hypovolemia or Anemia
- Electrolyte imbalance
- Anxiety / Pain / Emotional stress
- Fever / Infection / Sepsis
- Hypoxia
- Hypoglycemia
- Medication / Toxin / Drugs (see HX)
- Pulmonary embolus
- Trauma
- Tension Pneumothorax





Pediatric Tachycardia



Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Serious Signs and Symptoms:**
 - Respiratory distress / failure.
 - Signs of shock / poor perfusion with or without hypotension.
 - AMS
 - Sudden collapse with rapid, weak pulse
- **Narrow Complex Tachycardia (≤ 0.09 seconds):**
 - Sinus tachycardia: P waves present. Variable R-R waves. Infants usually < 220 beats / minute. Children usually < 180 beats / minute.
 - SVT: $> 90\%$ of children with SVT will have a narrow QRS (≤ 0.09 seconds.) P waves absent or abnormal. R-R waves not variable. Usually abrupt onset. Infants usually > 220 beats / minute. Children usually > 180 beats / minute.
 - Atrial Flutter / Fibrillation
- **Wide Complex Tachycardia (≥ 0.09 seconds):**
 - SVT with aberrancy.
 - VT: Uncommon in children. Rates may vary from near normal to > 200 / minute. Most children with VT have underlying heart disease / cardiac surgery / long QT syndrome / cardiomyopathy.
- **Torsades de Pointes / Polymorphic (multiple shaped) Tachycardia:**
 - Rate is typically 150 to 250 beats / minute.
 - Associated with long QT syndrome, hypomagnesaemia, hypokalemia, many cardiac drugs.
 - May quickly deteriorate to VT.
- **Vagal Maneuvers:**
 - Breath holding. Blowing a glove into a balloon. Have child blow out "birthday candles" or through an obstructed straw. Infants: May put a bag of ice water over the upper half of the face careful not to occlude the airway.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric paddles should be used in children < 10 kg or Broselow-Luten color Purple if available.
- Monitor for respiratory depression and hypotension associated if Diazepam or Midazolam is used.
- Continuous pulse oximetry is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Generally, the maximum sinus tachycardia rate is 220 – the patient's age in years.

Pediatric Shockable Rhythm Arrest

History

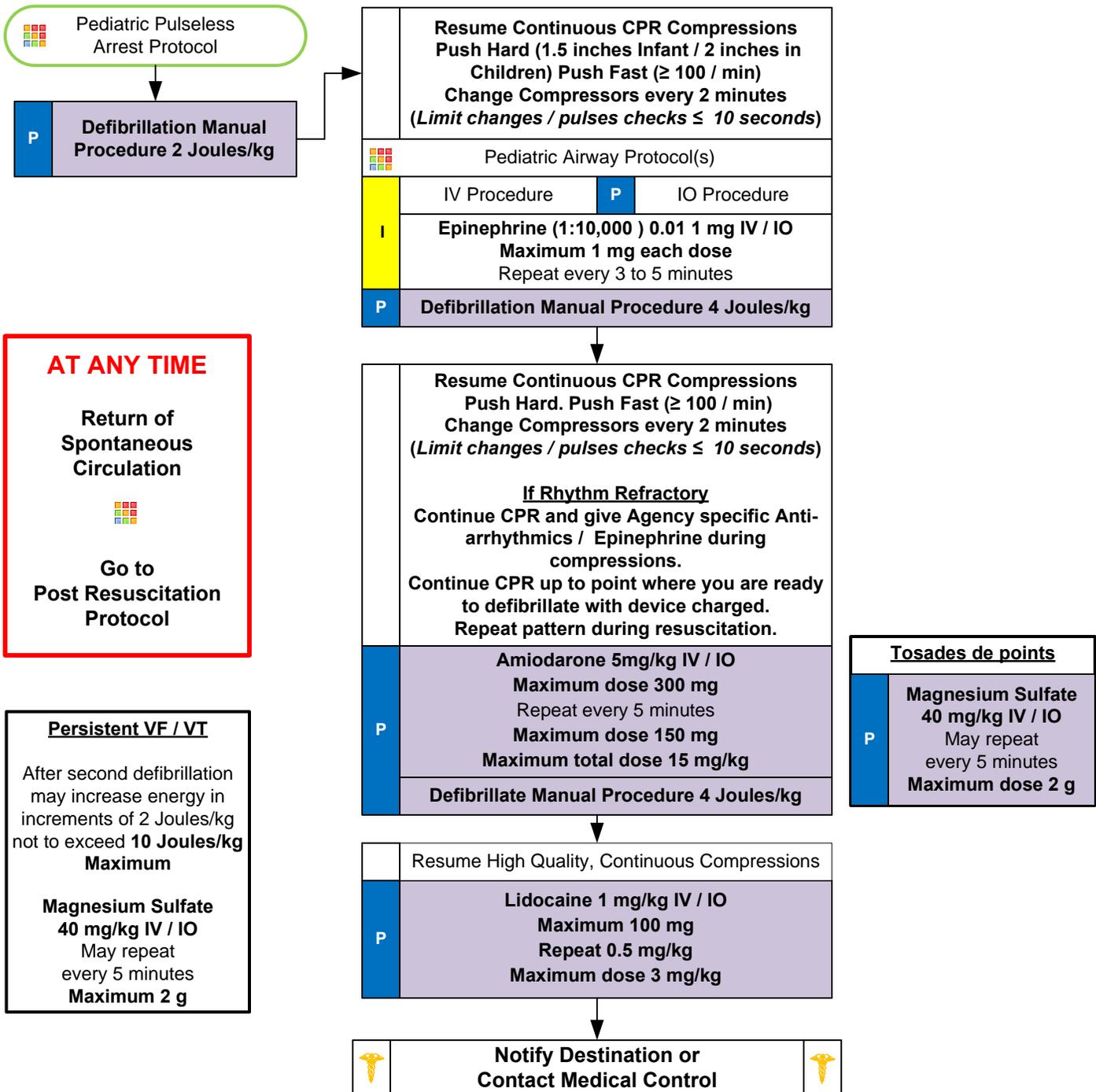
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

Signs and Symptoms

- Unresponsive
- Cardiac Arrest

Differential

- Respiratory failure / Airway obstruction
- Hyper / hypokalemia
- Hypovolemia
- Hypothermia
- Hypoglycemia
- Acidosis
- Tension pneumothorax
- Tamponade
- Toxin or medication
- Thrombosis: Coronary / Pulmonary Embolism
- Congenital heart disease



Pediatric Shockable Rhythm Arrest

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress \geq 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or supraglottic device. Patient survival is often dependent on proper ventilation and oxygenation / Airway Interventions
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults early ventilation intervention is critical.
- In most cases pediatric airways can be managed by basic interventions.
- Reassess and document endotracheal tube placement and EtCO₂ frequently, after every move, and at transfer of care.
- Monophasic and Biphasic waveform defibrillators should use the same energy levels 2 joules / kg and increase to 4 joules / kg on subsequent shocks.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.

Pediatric Post Resuscitation

History

- Respiratory arrest
- Cardiac arrest

Signs/Symptoms

- Return of pulse

Differential

- Continue to address specific differentials associated with the original dysrhythmia

Arrhythmias are common and usually self limiting after ROSC



If Arrhythmia Persists follow Rhythm Appropriate Protocol

Repeat Primary Assessment	
B	Optimize Ventilation and Oxygenation <ul style="list-style-type: none"> Maintain SpO2 ≥ 94 % Advanced airway if indicated ETCO2 ideally 35 – 45 mm Hg Respiratory Rate 8 – 10 Remove Impedence Threshold Device DO NOT HYPERVENTILATE
	Monitor Vital Signs / Reassess
B	12 Lead ECG Procedure
I	IV Procedure
P	IO Procedure
P	Cardiac Monitor

Hypotension Age Based

0 – 28 Days
< 60 mmHg

1 Month to 1 Year
< 70 mmHg

1 to 10 Years
< 70 + (2 x age) mmHg

11 Years and older
< 90 + (2 x age) mmHg

I	Normal Saline Bolus 10 mL/kg IV / IO May repeat to 60 mL/kg If lungs remain clear
P	Dopamine 2 – 20 mcg/kg/min IV / IO Titrate to Sys BP age appropriate

Pediatric Bradycardia Protocol

Hypotension Age based

Blood Glucose ≤ 69 or ≥ 250

Symptomatic Bradycardia

Symptomatic Tachycardia

ROSC After Defibrillation and NO Antiarrhythmic

Pediatric Diabetic Protocol

Pediatric Tachycardia Protocol

P	Amiodarone 5 mg/kg IV / IO Infuse over 10 minutes
---	---

P	Continue Antiarrhythmic Utilized Refer to Appropriate Pediatric Arrhythmia Protocol
---	--

P	Consider Sedation Use only with definitive airway in place Midazolam 0.1 – 0.2 mg/kg IV / IO May repeat in 3 – 5 minutes as needed
---	---

Notify Destination or Contact Medical Control

Pediatric Cardiac Section

Pediatric Post Resuscitation

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- Hyperventilation is a significant cause of hypotension / recurrence of cardiac arrest in post resuscitation phase and must be avoided.
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

Protocol 54

This protocol has been altered from the original 2012 NCCEP Protocol by the local EMS Medical Director

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This protocol is intentionally left blank for future expansion

Pediatric Allergic Reaction

History

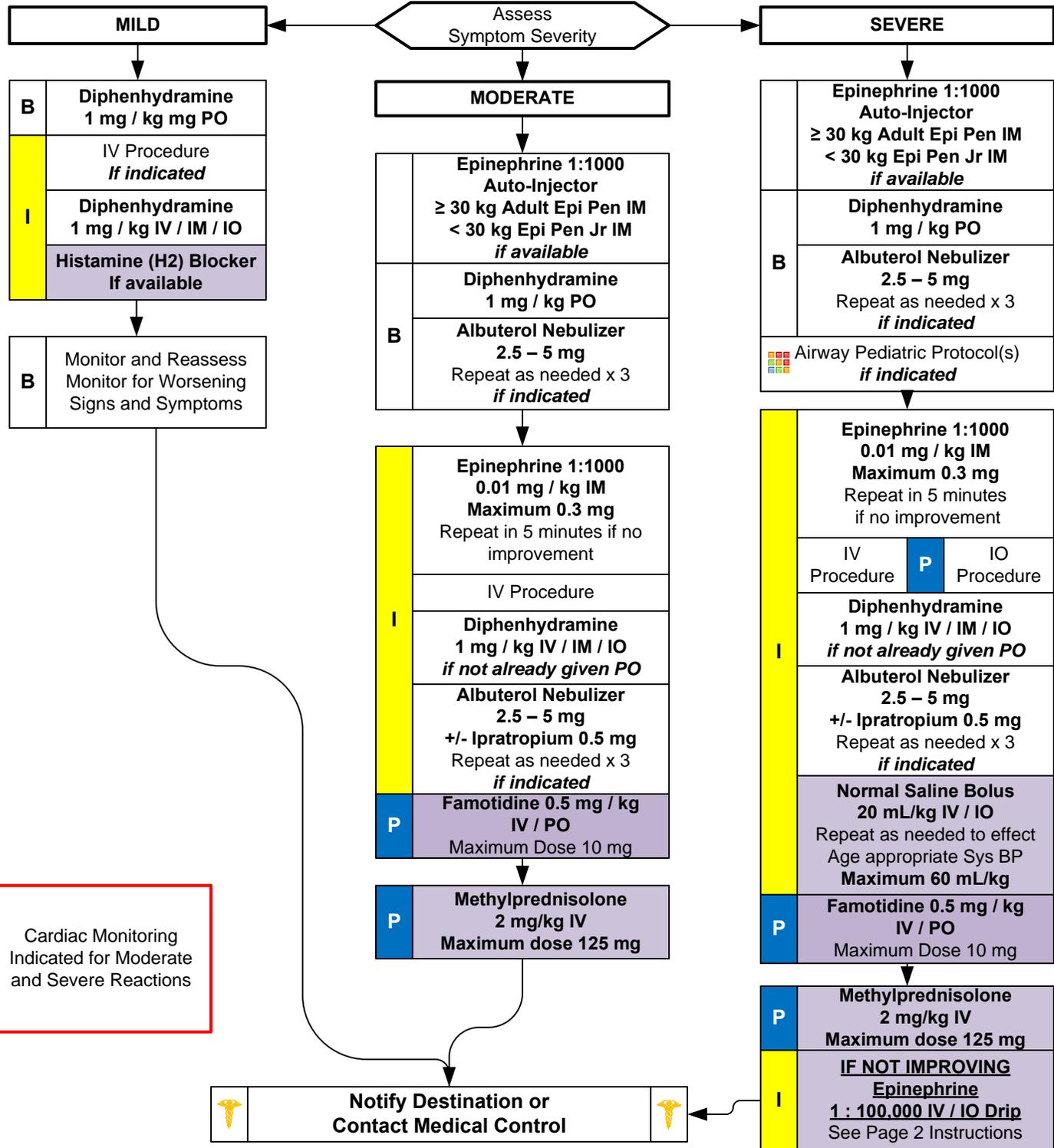
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past medical history / reactions
- Medication history

Signs and Symptoms

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

Differential

- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma / COPD / CHF



Pediatric Allergic Reaction

Epinephrine 1:100,000
Mix 1 mg of Epinephrine
Into 1000 mL of Normal Saline

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.)**
- **IV / IO Epinephrine 1:10,000 (0.01 mg/kg) IVP (max 1 mg) in the presence of Shock. Several dosing regimens exist and should be determined by local medical director.**
- **Symptom Severity Classification:**
 - Mild symptoms:**
Flushing, hives, itching, erythema with normal blood pressure and perfusion.
 - Moderate symptoms:**
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.
 - Severe symptoms:**
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.
- Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.
- Fluids and Medication titrated to maintain a SBP $>70 + (\text{age in years} \times 2)$ mmHg.
- MR / EMT-B may administer Epinephrine IM and may administer from EMS supply.
- EMT-B may administer diphenhydramine by oral route only and may administer from EMS supply.
- EMT-B may administer Albuterol / Ipratropium if patient already prescribed and may administer from EMS supply.
- Patients with moderate and severe reactions should receive a 12 lead ECG and should be continually monitored, but this should NOT delay administration of epinephrine.
- The shorter the onset from symptoms to contact, the more severe the reaction.
- The shorter the onset from exposure to symptoms the more severe the reaction.



Pediatric Altered Mental Status



History

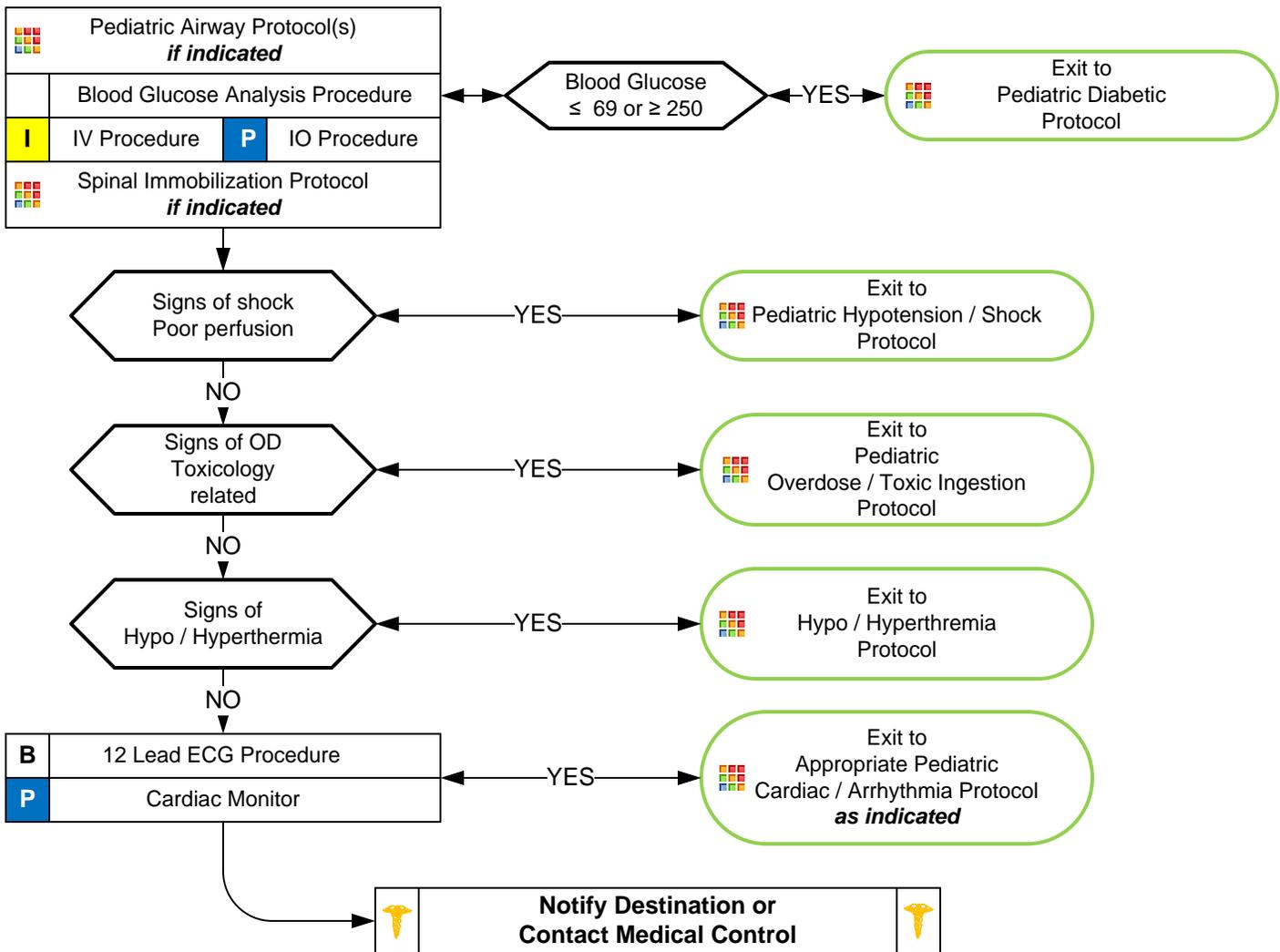
- Past medical history
- Medications
- Recent illness
- Irritability
- Lethargy
- Changes in feeding / sleeping
- Diabetes
- Potential ingestion
- Trauma

Signs and Symptoms

- Decrease in mentation
- Change in baseline mentation
- Decrease in Blood sugar
- Cool, diaphoretic skin
- Increase in Blood sugar
- Warm, dry, skin, fruity breath, kussmaul respirations, signs of dehydration

Differential

- Hypoxia
- CNS (trauma, stroke, seizure, infection)
- Thyroid (hyper / hypo)
- Shock (septic-infection, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological
- Acidosis / Alkalosis
- Environmental exposure
- Electrolyte abnormalities
- Psychiatric disorder



Pediatric Medical Section Protocols

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Pay careful attention to the head exam for signs of bruising or other injury.**
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon
- Consider alcohol, prescription drugs, illicit drugs and Over the Counter preparations as a potential etiology.
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.

Pediatric Diabetic

History

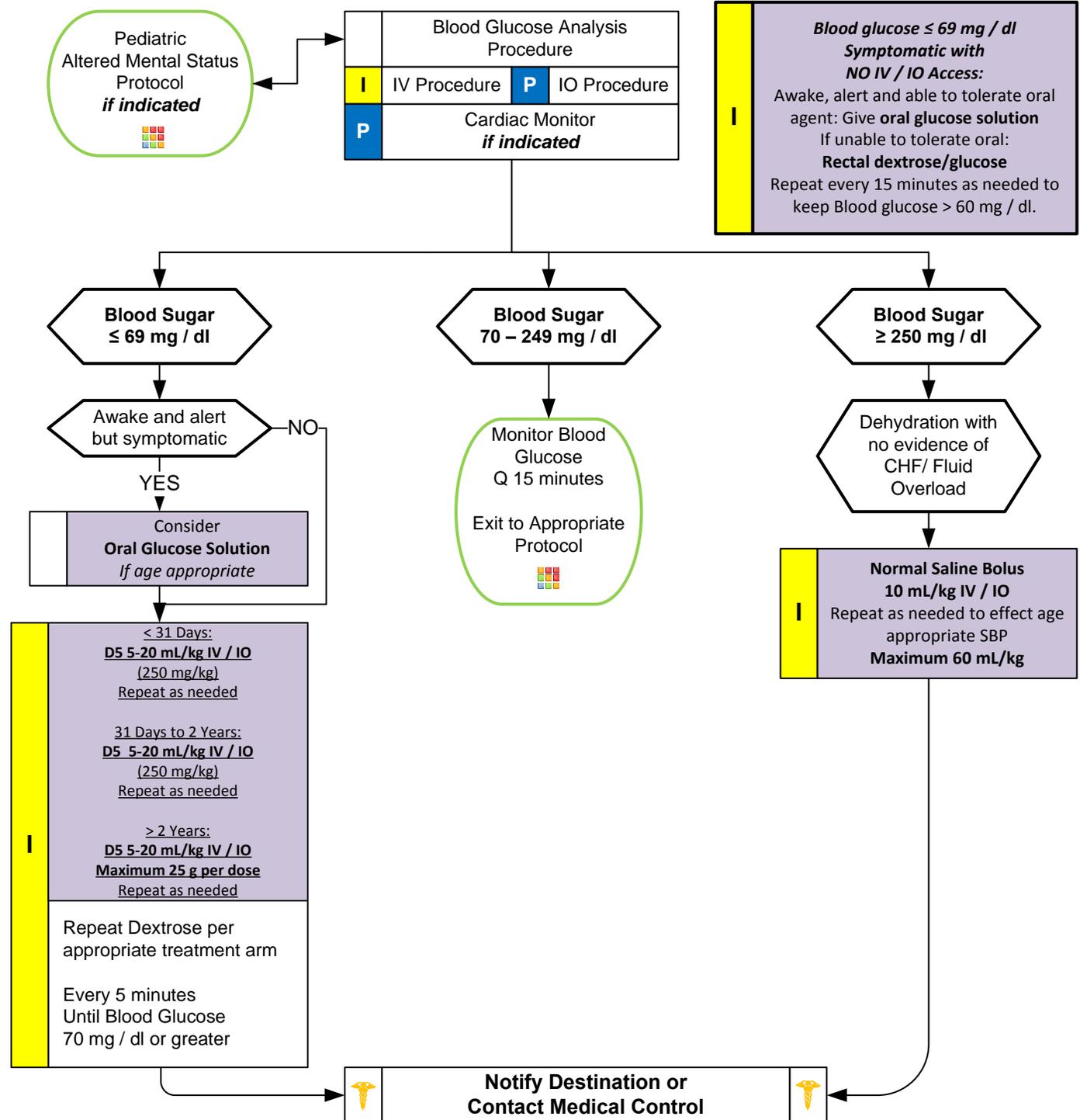
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms

- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential

- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.



Pediatric Diabetic



Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Patients with prolonged hypoglycemia may not respond to glucagon.
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- **Make D10 by removing 10 mL of D50 and dilute with 40 mL of NS. Make D25 by removing 25 mL of D50 and dilute with 25 mL of NS.**
- In extreme circumstances with no IV and no response to glucagon Dextrose 50 % can be administered rectally. Contact medical control for advice.
- Quality control checks should be maintained per manufacturers recommendation for all glucometers.
- **Patient Refusal:**
Adult caregiver must be present with pediatric patient. Blood sugar must be 100 or greater and patient has ability to eat and availability of food with responders on scene. Patient must have known history of diabetes and not be taking any oral diabetic agents. Otherwise contact medical control.



Pediatric Hypotension / Shock



History

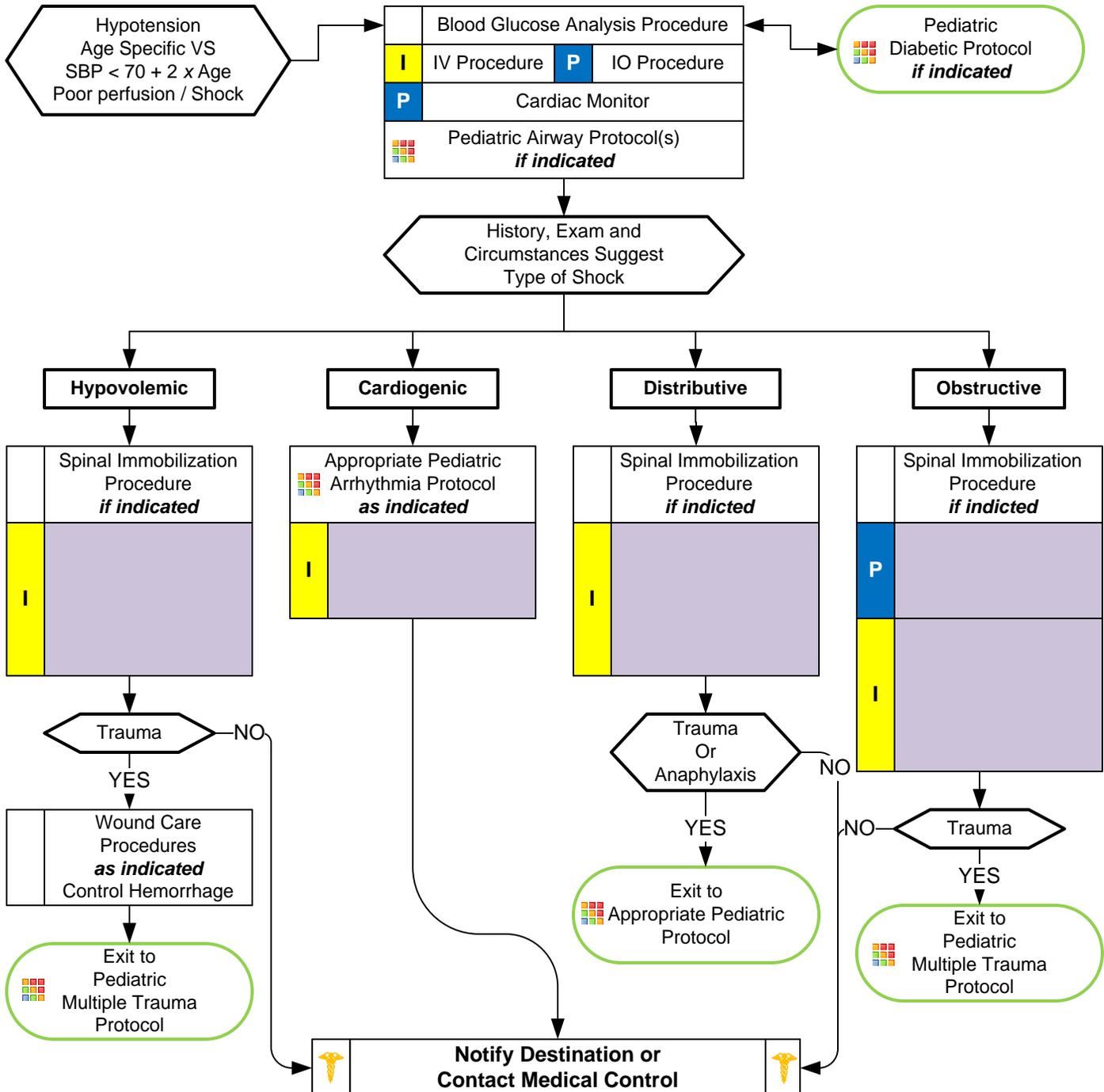
- Blood loss
- Fluid loss
- Vomiting
- Diarrhea
- Fever
- Infection

Signs and Symptoms

- Restlessness, confusion, weakness
- Dizziness
- Tachycardia
- Hypotension (Late sign)
- Pale, cool, clammy skin
- Delayed capillary refill
- Dark-tarry stools

Differential

- Shock
 - Hypovolemic
 - Cardiogenic
 - Septic
 - Neurogenic
 - Anaphylactic
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin





Hypotension / Shock



Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: $70 + 2 \times \text{age in years}$.**
- **Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.**
- **Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.**
- **Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Hypovolemic Shock:**
Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
- **Cardiogenic Shock:**
Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventricular / septum / valve / toxins.
- **Distributive Shock:**
Sepsis
Anaphylactic
Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
Toxins
- **Obstructive Shock:**
Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency:** State where body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary adrenal disease or more commonly have stopped a steroid like prednisone. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. If suspected EMT-P should give **Methylprednisolone 2 mg/kg IV / IO** or **Dexamethasone 0.3 mg/kg (Maximum 10 mg) IV / IO**. Use agency-specific steroid.

Pediatric Overdose / Toxic Ingestion

History

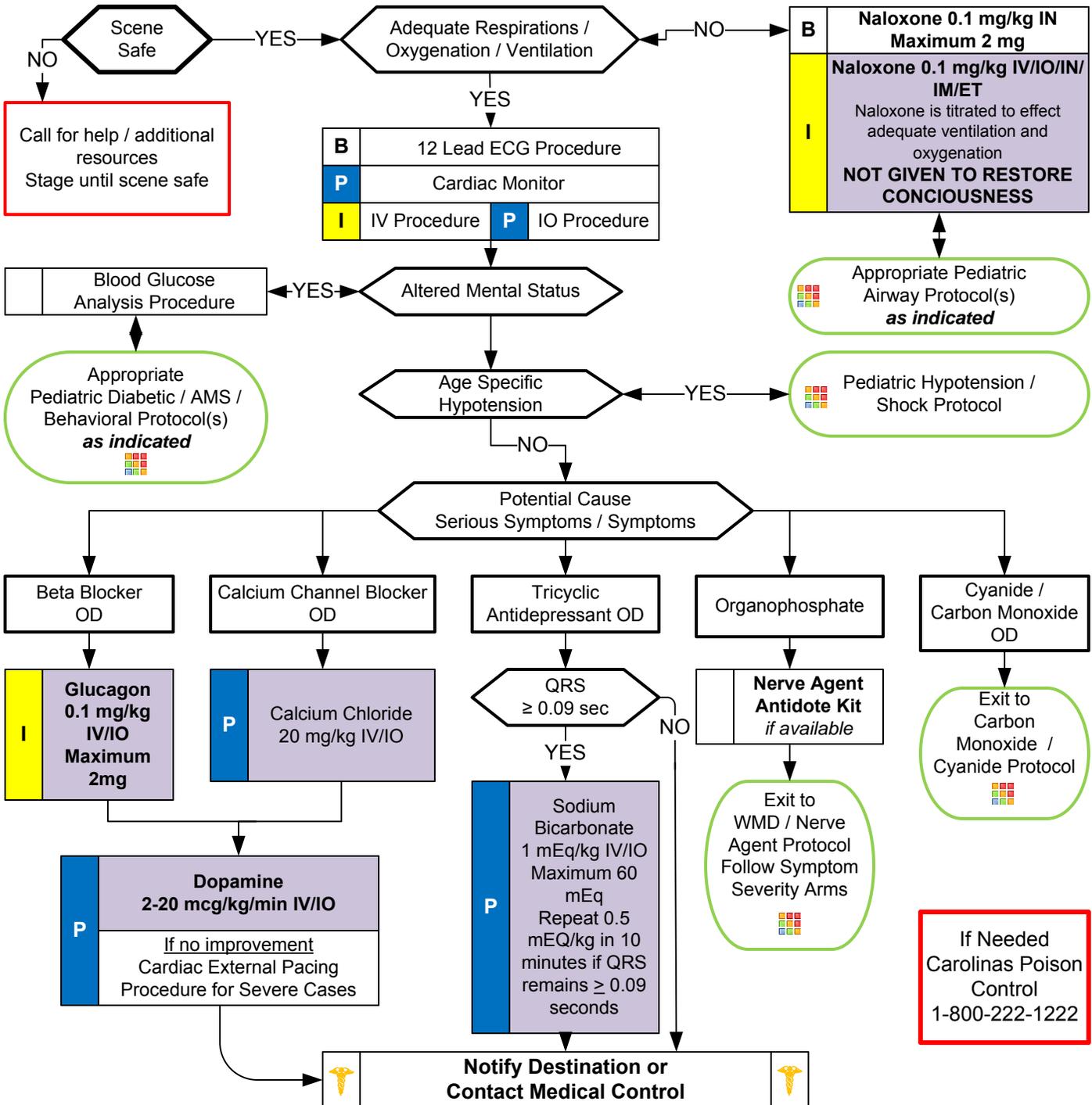
- Ingestion or suspected ingestion of potentially toxic substance
- Substance ingested, route, quantity
- Time of Ingestion is important
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications, past psychiatric history

Signs and Symptoms

- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- Salivation, Lacrimation, Urination; increased, loss of control, Defecation / Diarrhea, GI Upset; Abdominal pain / cramping, Emesis, Muscle Twitching

Differential

- Tricyclic antidepressants
- Acetaminophen
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)



Pediatric Overdose / Toxic Ingestion

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons. Bring bottles, contents, emesis to ED.**
- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.**
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin:** Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **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 changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- Consider contacting the North Carolina Poison Control Center for guidance.



Pediatric Respiratory Distress



History

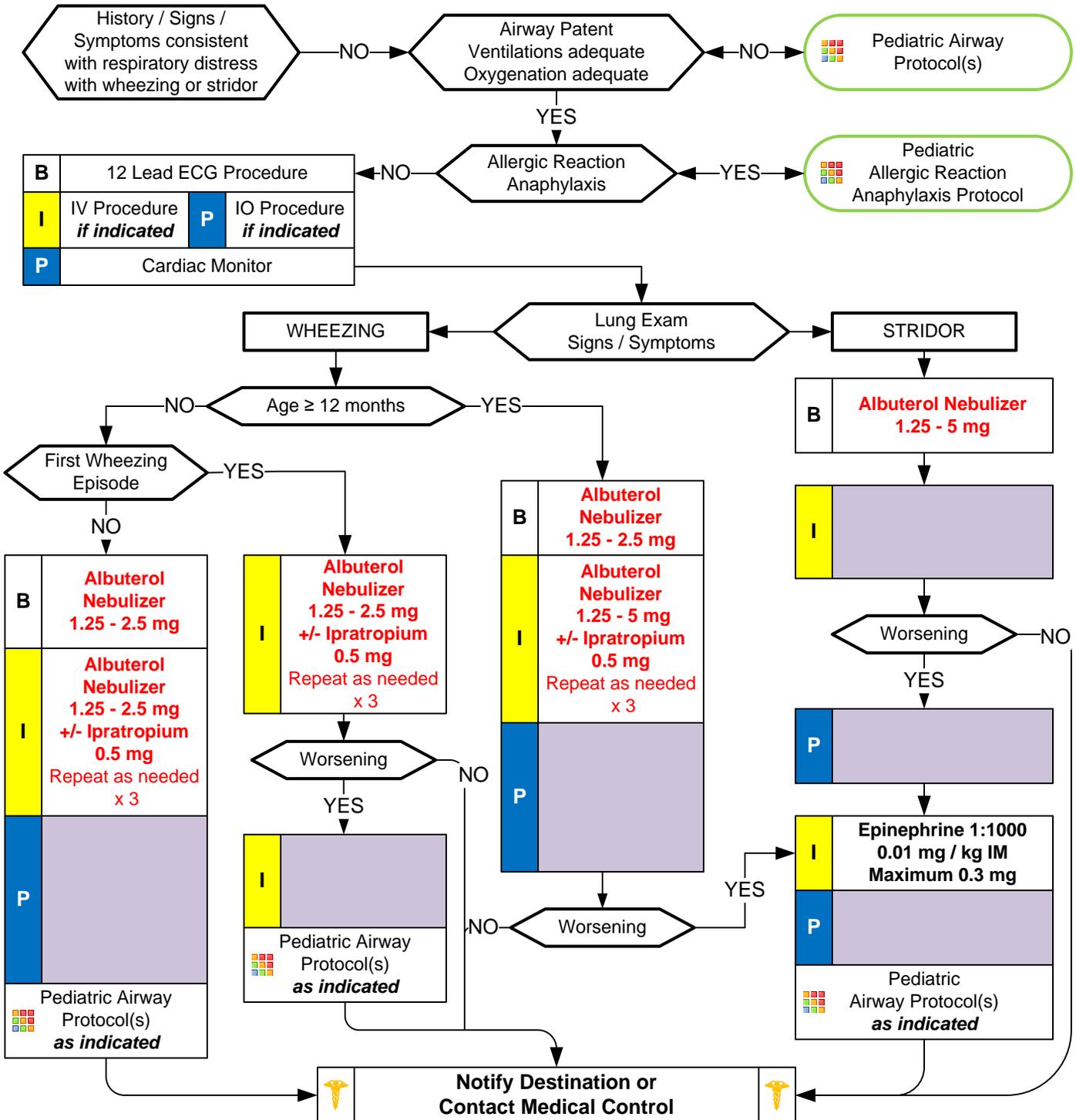
- Time of onset
- Possibility of foreign body
- Past Medical History
- Medications
- Fever / Illness
- Sick Contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

Signs and Symptoms

- Wheezing / Stridor / Crackles / Rales
- Nasal Flaring / Retractions / Grunting
- Increased Heart Rate
- AMS
- Anxiety
- Attentiveness / Distractability
- Cyanosis
- Poor feeding
- JVD / Frothy Sputum
- Hypotension

Differential

- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma



Pediatric Medical Section Protocols



Pediatric Respiratory Distress



Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **Pulse oximetry should be monitored continuously in the patient with respiratory distress.**
- **EMT-B may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.
- **Albuterol dosing: ≤ 1 year of age 1.25 mg; 1 – 6 years 1.25 – 2.5 mg; 6 – 14 years 2.5 mg; ≥ 15 years 2.5 – 5 mg.**
- **Consider IV access when Pulse oximetry remains $\leq 92\%$ after first beta agonist treatment.**
- Do not force a child into a position, allow them to assume position of comfort. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control.
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to beta-agonists. Consider Epinephrine nebulizer if patient < 18 months and not responding to initial beta-agonist treatment.
- Croup typically affects children < 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted.
- Epiglottitis typically affects children > 2 years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, drooling is common. Airway manipulation may worsen the condition.
- In patients using levalbuterol (Xopenex) you may use Albuterol for the first treatment then use the patient's supply for repeat nebulizers or agency's supply.



Pediatric Seizure



History

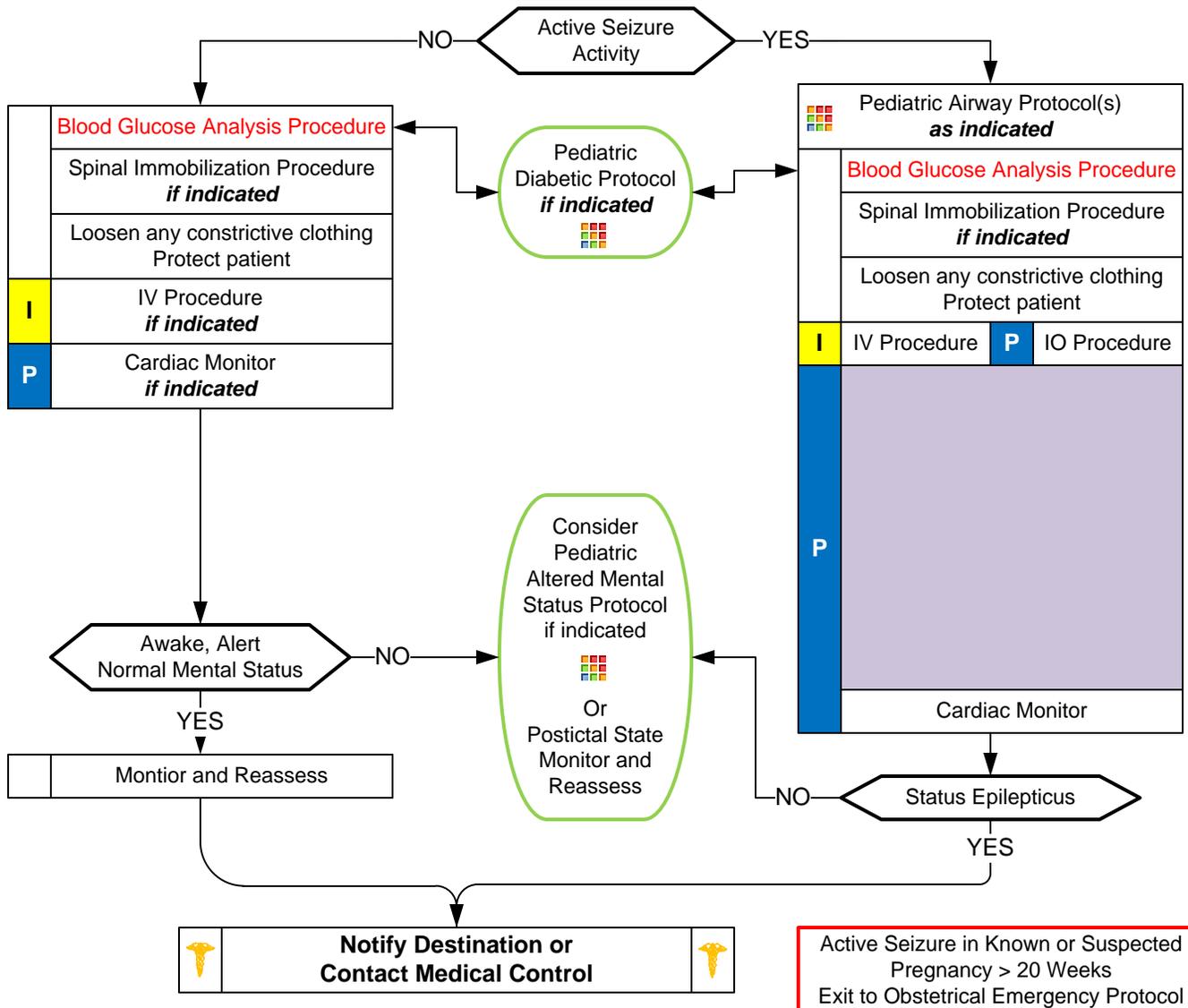
- Fever
- Sick contacts
- Prior history of seizures
- Medication compliance
- Recent head trauma
- Whole body vs unilateral seizure activity
- Duration, Single/multiple
- Congenital Abnormality

Signs and Symptoms

- Fever; hot, dry skin
- Seizure activity
- Incontinence
- Tongue trauma
- Rash
- Nuchal rigidity
- Altered mental status

Differential

- Febrile seizure
- Infection
- Head trauma
- Medication or Toxin
- Hypoxia or Respiratory failure
- Hypoglycemia
- Metabolic abnormality / acidosis
- Tumor



Pediatric Medical Section Protocols

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Midazolam 0.2 mg/kg (Maximum 10 mg) IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- Addressing the ABCs and verifying blood glucose is as important than stopping the seizure.
- Be prepared to assist ventilations especially if a benzodiazepine is used. Avoiding hypoxemia is extremely important.
- In an infant, a seizure may be the only evidence of a closed head injury.
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- Assess possibility of occult trauma and substance abuse, overdose or ingestion / toxins and fever.

Protocol 62

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS

2012



Pediatric Vomiting / Diarrhea



History

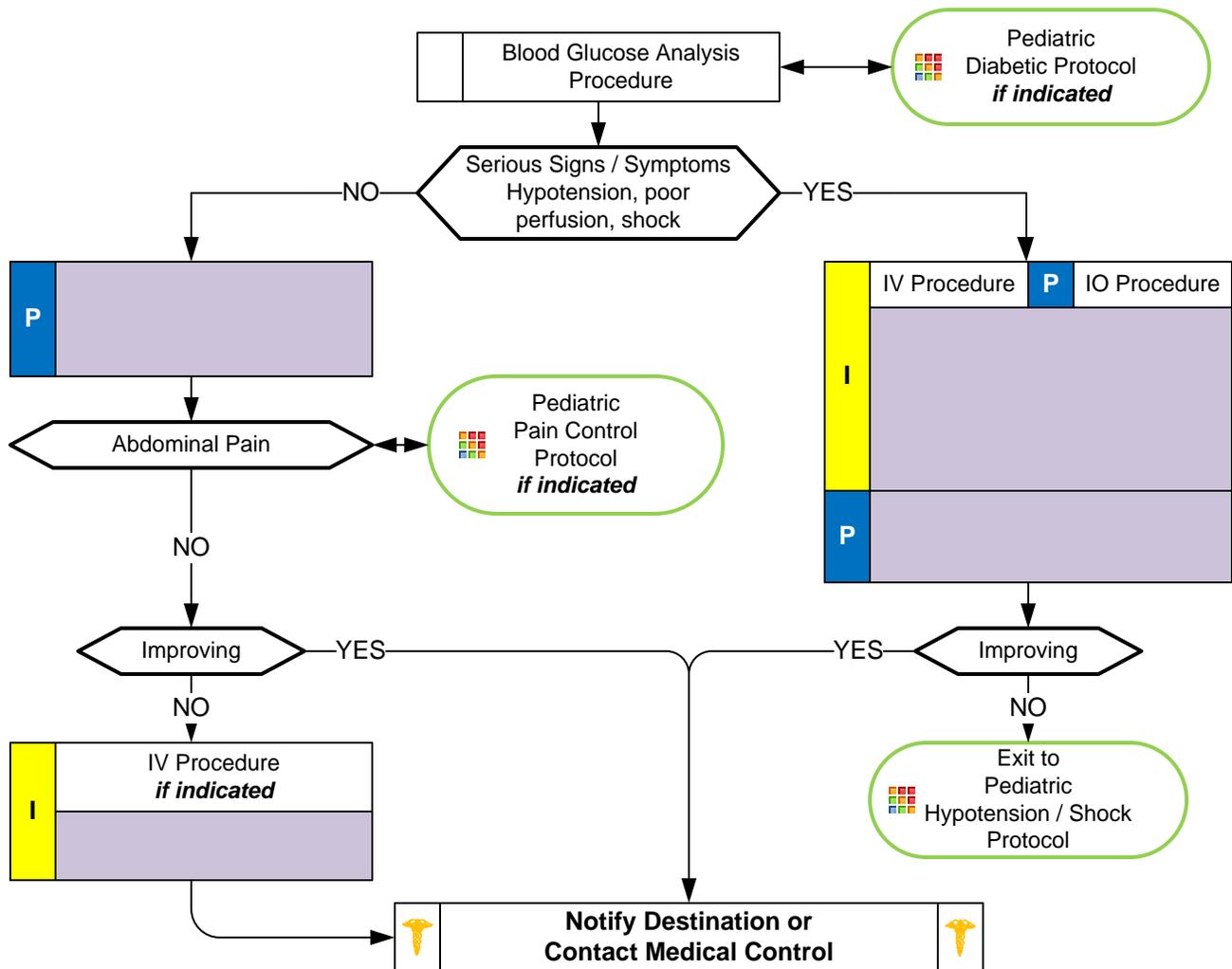
- Age
- Time of last meal
- Last bowel movement / emesis
- Improvement or worsening with food or activity
- Other sick contacts
- Past Medical History
- Past Surgical History
- Medications
- Travel history
- Bloody Emesis or diarrhea

Signs and Symptoms

- Pain
- Distension
- Constipation
- Diarrhea
- Anorexia
- Fever
- Cough,
- Dysuria

Differential

- CNS (Increased pressure, headache, tumor, trauma or hemorrhage)
- Drugs
- Appendicitis
- Gastroenteritis
- GI or Renal disorders
- Diabetic Ketoacidosis
- Infections (pneumonia, influenza)
- Electrolyte abnormalities



Pediatric Medical Section Protocols

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.**
- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.**
- Beware of vomiting only in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.

	<p>This protocol is intentionally left blank for future expansion</p>	
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Pediatric Head Trauma

History

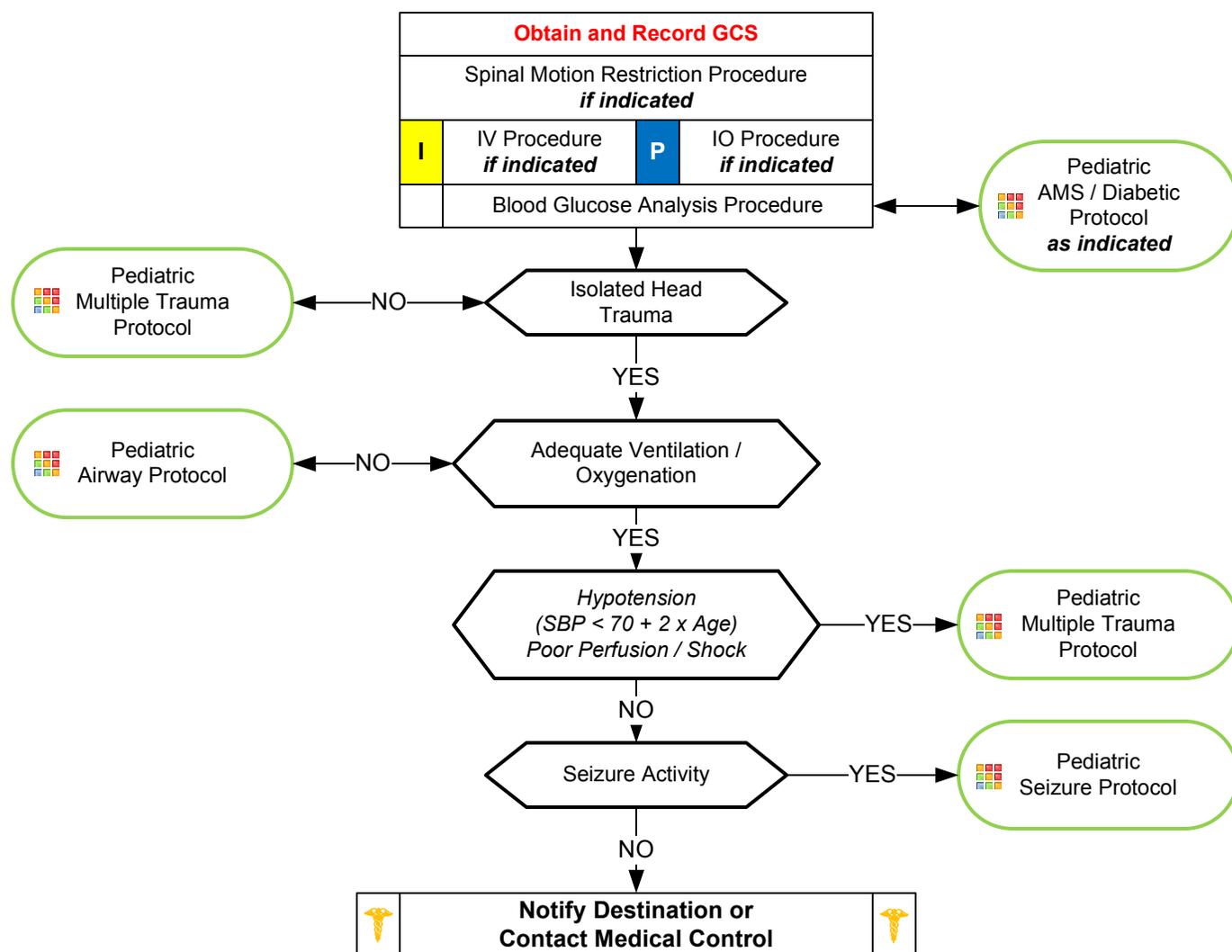
- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

Signs and Symptoms

- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

Differential

- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse



Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **GCS is a key performance measure used to evaluate protocol compliance and care**
- **If GCS < 12 consider air transport and reduce on scene time if GCS < 9 - intubation should be anticipated.**
- **Hyperventilate the patient only if evidence of herniation (blown pupil, decorticate / decerebrate posturing, bradycardia, decreasing GCS). If hyperventilation is needed (35 / minute for infants <1 year and 25 / minute for children >1 year) EtCO2 should be maintained between 30 - 35 mmHg.**
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively.
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Concussions are traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache. Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.
- Fluid resuscitation should be titrated to maintain at least a systolic BP of > 70 + 2 x the age in years.

Pediatric Multiple Trauma

History

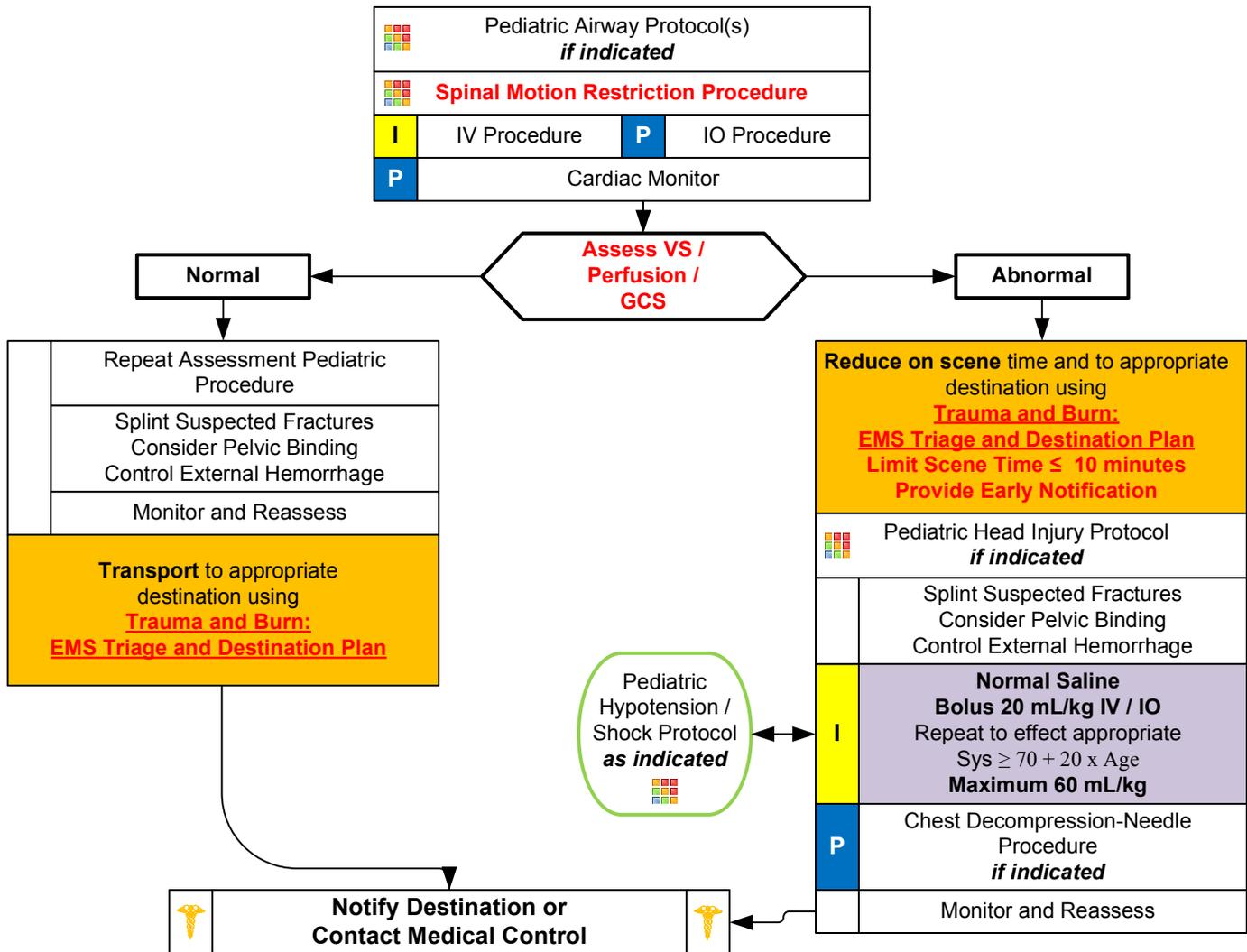
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

Signs and Symptoms

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential

- Chest: Tension pneumothorax
Flail chest, Hemothorax
Pericardial tamponade
Open chest wound
- Intra-abdominal bleeding
- Pelvis / Femur / Spine fracture, cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia



Pearls

- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained ≥ 90%**
- Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.
- Consider Chest Decompression with signs of shock and injury to torso and evidence of tension pneumothorax.
- See Regional Trauma Guidelines when declaring Trauma Activation.
- Severe bleeding from an extremity not rapidly controlled with direct pressure may necessitate the application of a tourniquet.
- Do not overlook the possibility of child abuse.

Pediatric Thermal Burn

History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal
- Chemical – Electrical

Assess Burn / Concomitant Injury Severity

Minor Burn

Serious Burn

Critical Burn

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated,
Normotensive
GCS 14 or Greater

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring
intubation for airway stabilization
Hypotension or GCS 13 or Less
(When reasonably accessible,
transport to a Burn Center)

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway
compromise
(When reasonably accessible,
transport to a Burn Center)

Remove Rings, Bracelets /
Constricting Items
Dry Clean Sheet or Dressings

Pediatric Multiple Trauma Protocol
if indicated

Pediatric Airway Protocol(s)
as indicated

IV Procedure
if indicated

Normal Saline
0.25 mL / kg (x % TBSA) / hr
for up to the first 8 hours.
(More info below)
Lactated Ringers
if available

Pediatric Pain Control Protocol
if indicated

Remove Rings, Bracelets / Constricting Items
Dry Clean Sheet or Dressings

Pediatric Multiple Trauma Protocol
if indicated

Pediatric Airway Protocol(s)
as indicated

IV Procedure
Consider 2 IV sites if greater than 15 % TBSA

Normal Saline
0.25 mL / kg (x % TBSA) / hr
for up to the first 8 hours.
(More info below)
Lactated Ringers
if available

IO Procedure *if indicated*

Pediatric Pain Control Protocol
if indicated

Carbon Monoxide /
Cyanide Exposure

NO

Transport Facility of Choice

Carbon
Monoxide /
Cyanide
Protocol

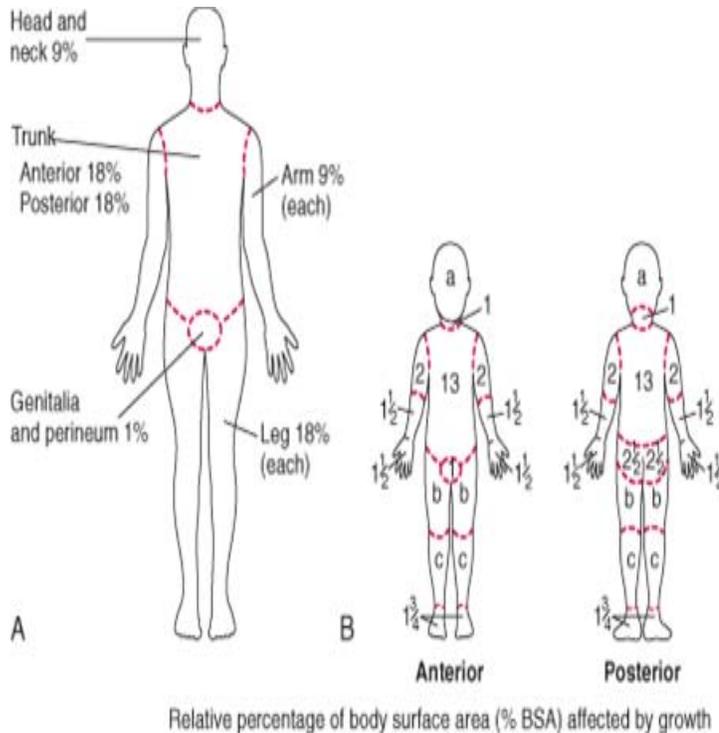
Carbon Monoxide /
Cyanide Exposure

NO

Reduce on scene time
And transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or
Contact Medical Control

1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.
2. Formula example: an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.



Body Part	Age				
	0 yr	1 yr	5 yr	10 yr	15 yr
a = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b = 1/2 of 1 thigh	2 3/4	3 1/4	4	4 1/4	4 1/2
c = 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burn from those of partial (2nd) or full (3rd) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1st degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th 5th and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns.
- Other burn classifications in general include:
 - 4th referring to a burn that destroys the dermis and involves muscle tissue.
 - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
 - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Estimate spotty areas of burn by using the size of the patient's palm as 1 %

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**

Critical or Serious Burns:

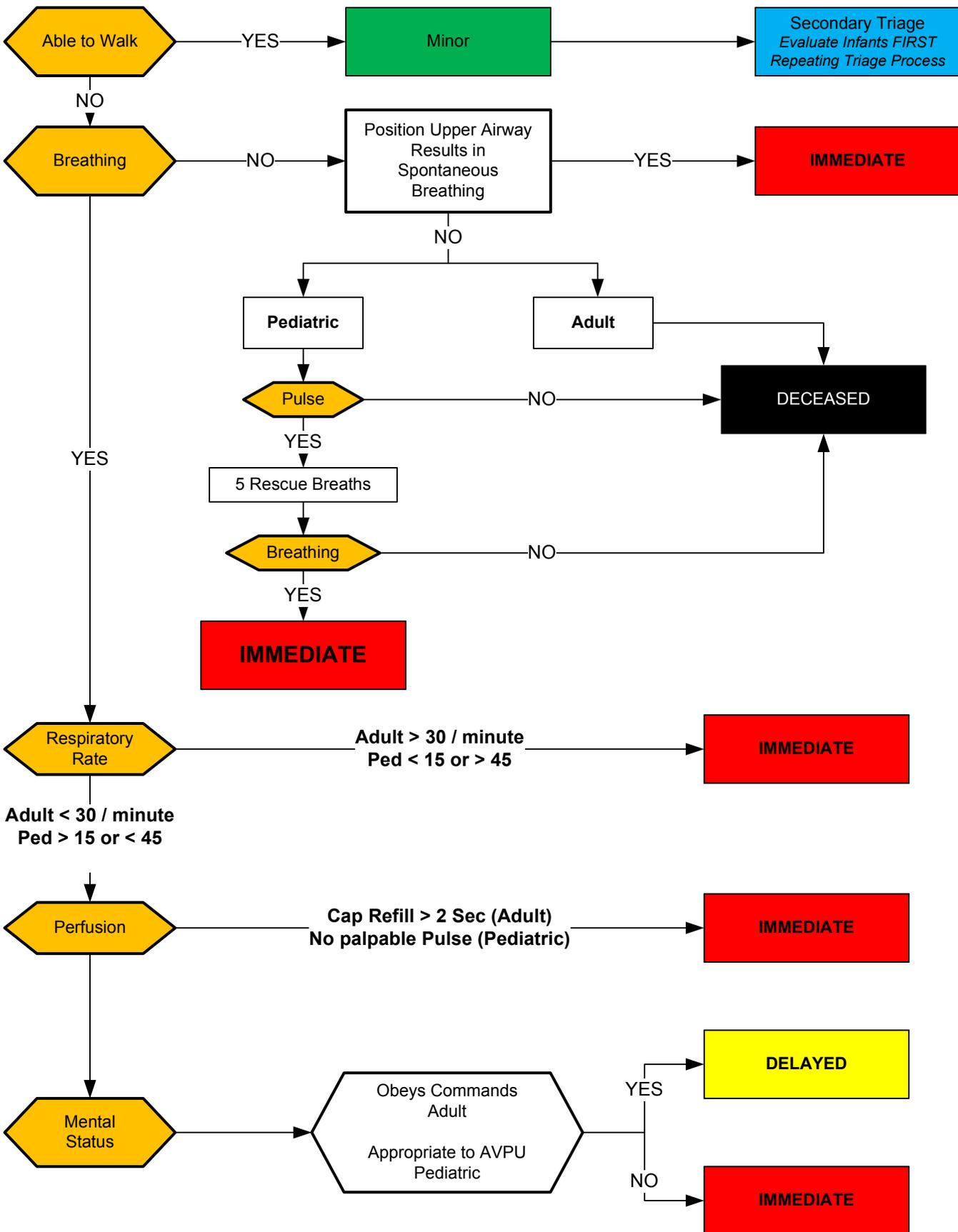
- **> 5-15% total body surface area (TBSA) 2nd or 3rd degree burns, or**
- **3rd degree burns > 5% TBSA for any age group, or**
- **circumferential burns of extremities, or**
- **electrical or lightning injuries, or**
- **suspicion of abuse or neglect, or**
- **inhalation injury, or**
- **chemical burns, or**
- **burns of face, hands, perineum, or feet, or**
- **any burn requiring hospitalization.**
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.
- Never administer IM pain injections to a burn patient.

Blank

This protocol is intentionally left blank for future expansion

Triage

Multiple Casualty Incident / Multiple Patient Incident



Triage

Multiple Casualty Incident / Multiple Patient Incident

Pearls

- First evaluate all children who did not walk under their own power where possible and safety allows.
- Capillary refill can be altered by many factors including skin temperature. Age-appropriate heart rate may also be used in triage decisions.



Dental Problems



History

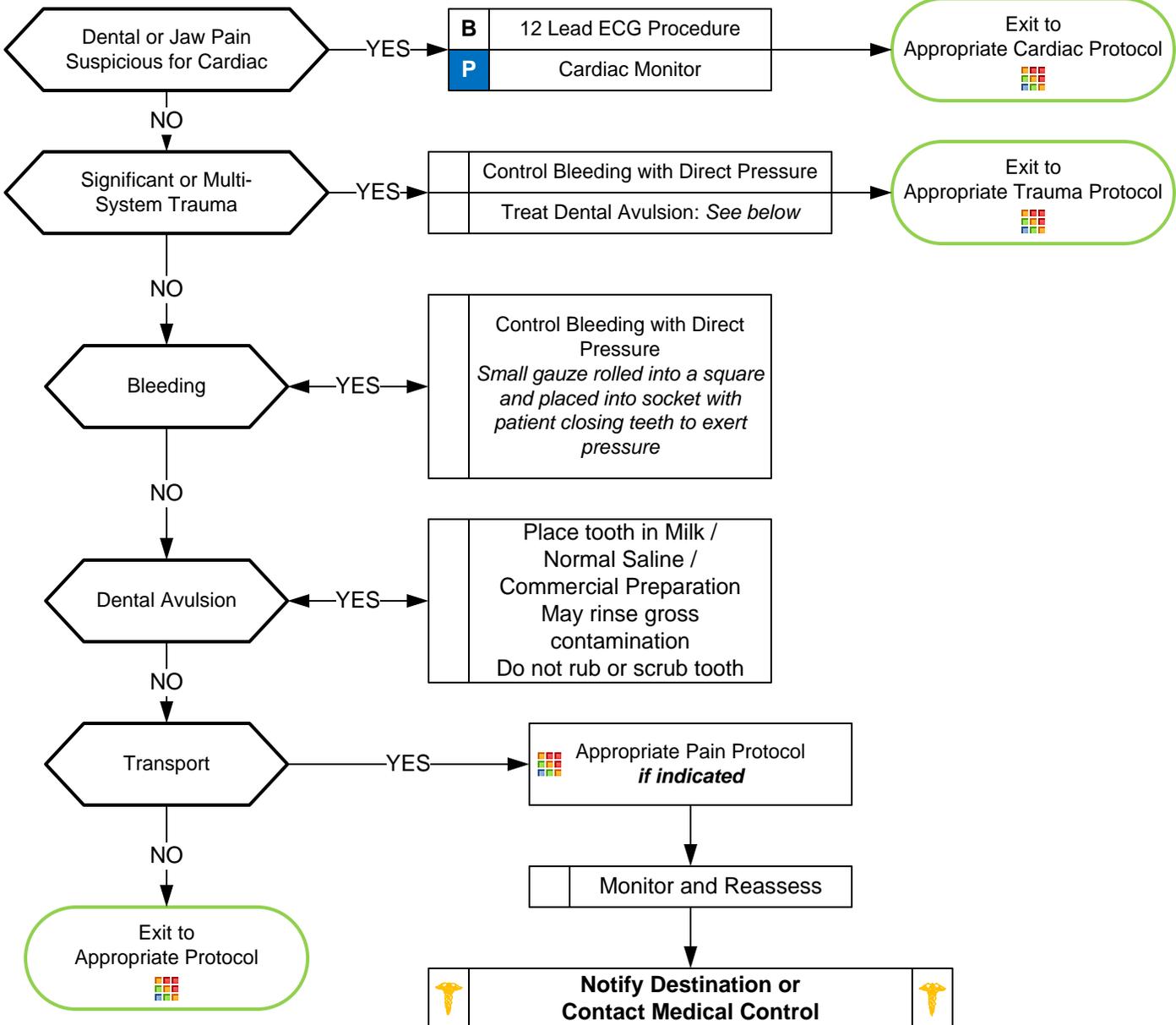
- Age
- Past medical history
- Medications
- Onset of pain / injury
- Trauma with "knocked out" tooth
- Location of tooth
- Whole vs. partial tooth injury

Signs and Symptoms

- Bleeding
- Pain
- Fever
- Swelling
- Tooth missing or fractured

Differential

- Decay
- Infection
- Fracture
- Avulsion
- Abscess
- Facial cellulitis
- Impacted tooth (wisdom)
- TMJ syndrome
- Myocardial infarction



Adult / Pediatric General Section Protocols

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Neuro**
- Significant soft tissue swelling to the face or oral cavity can represent a cellulitis or abscess.
- Scene and transport times should be minimized in complete tooth avulsions. Reimplantation is possible within 4 hours if the tooth is properly cared for.
- Occasionally cardiac chest pain can radiate to the jaw.
- All pain associated with teeth should be associated with a tooth which is tender to tapping or touch (or sensitivity to cold or hot).



Epistaxis



History

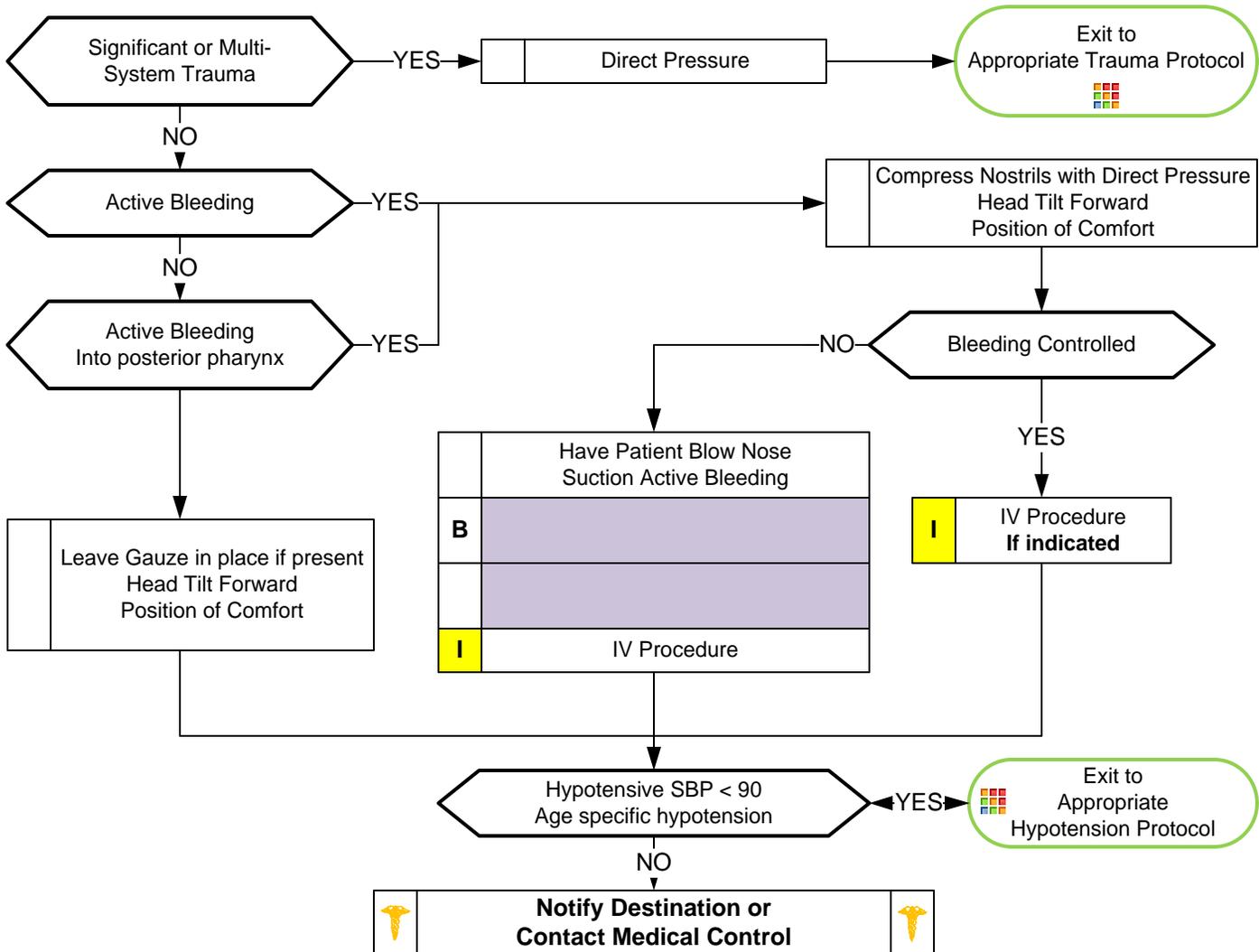
- Age
- Past medical history
- Medications (HTN, anticoagulants, aspirin, NSAIDs)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

Signs and Symptoms

- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

Differential

- Trauma
- Infection (viral URI or Sinusitis)
- Allergic rhinitis
- Lesions (polyps, ulcers)
- Hypertension



Adult / Pediatric General Section Protocols

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Avoid Afrin in patients who have a blood pressure of greater than 110 diastolic or known coronary artery disease.**
- Age specific hypotension: 0 – 28 days < 60 mmHg, 1 month – 1 year < 70 mmHg, 1 year – 10 years < 70 + (2 x age)mmHg, 11 years and greater < 90 mmHg.
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharynx.
- Anticoagulants include warfarin (Coumadin), heparin, enoxaparin (Lovenox), dabigatran (Pradaxa), rivaroxaban (Xarelto), and many over the counter headache relief powders.
- Anti-platelet agents like aspirin, clopidogrel (Plavix), aspirin/dipyridamole (Aggrenox), and ticlopidine (Ticlid) can contribute to bleeding.



Fever / Infection Control



History

- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Last acetaminophen or ibuprofen

Signs and Symptoms

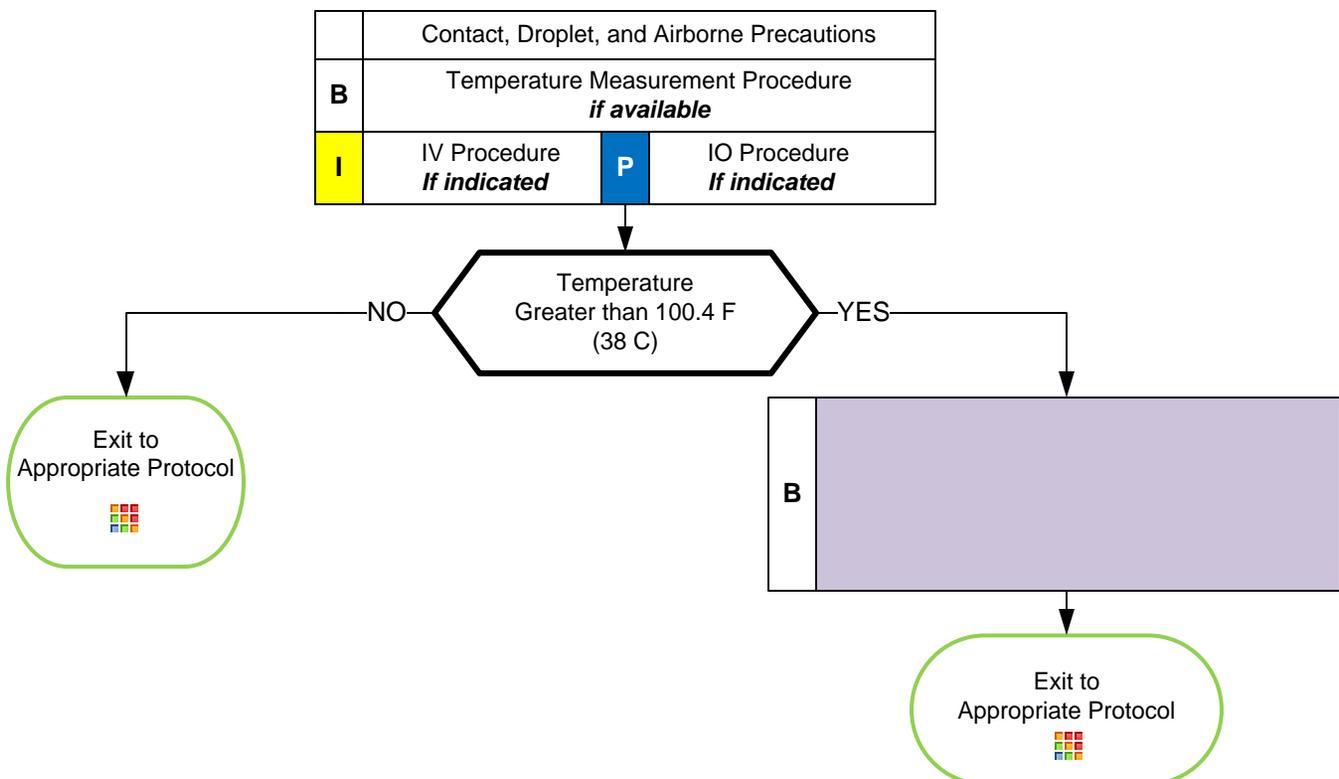
- Warm
- Flushed
- Sweaty
- Chills/Rigors

Associated Symptoms (Helpful to localize source)

- myalgias, cough, chest pain, headache, dysuria, abdominal pain, mental status changes, rash

Differential

- Infections / Sepsis
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease
 - Arthritis
 - Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis



Adult / Pediatric General Section Protocols

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions** include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions** include standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- Rehydration with fluids increased the patients ability to sweat and improves heat loss.
- All patients should have drug allergies documented prior to administering pain medications.
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen.
- NSAIDs should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child.
- Agency Medical Director may require contact of medical control prior to EMT-B / MR administering any medication.



Police Custody



History

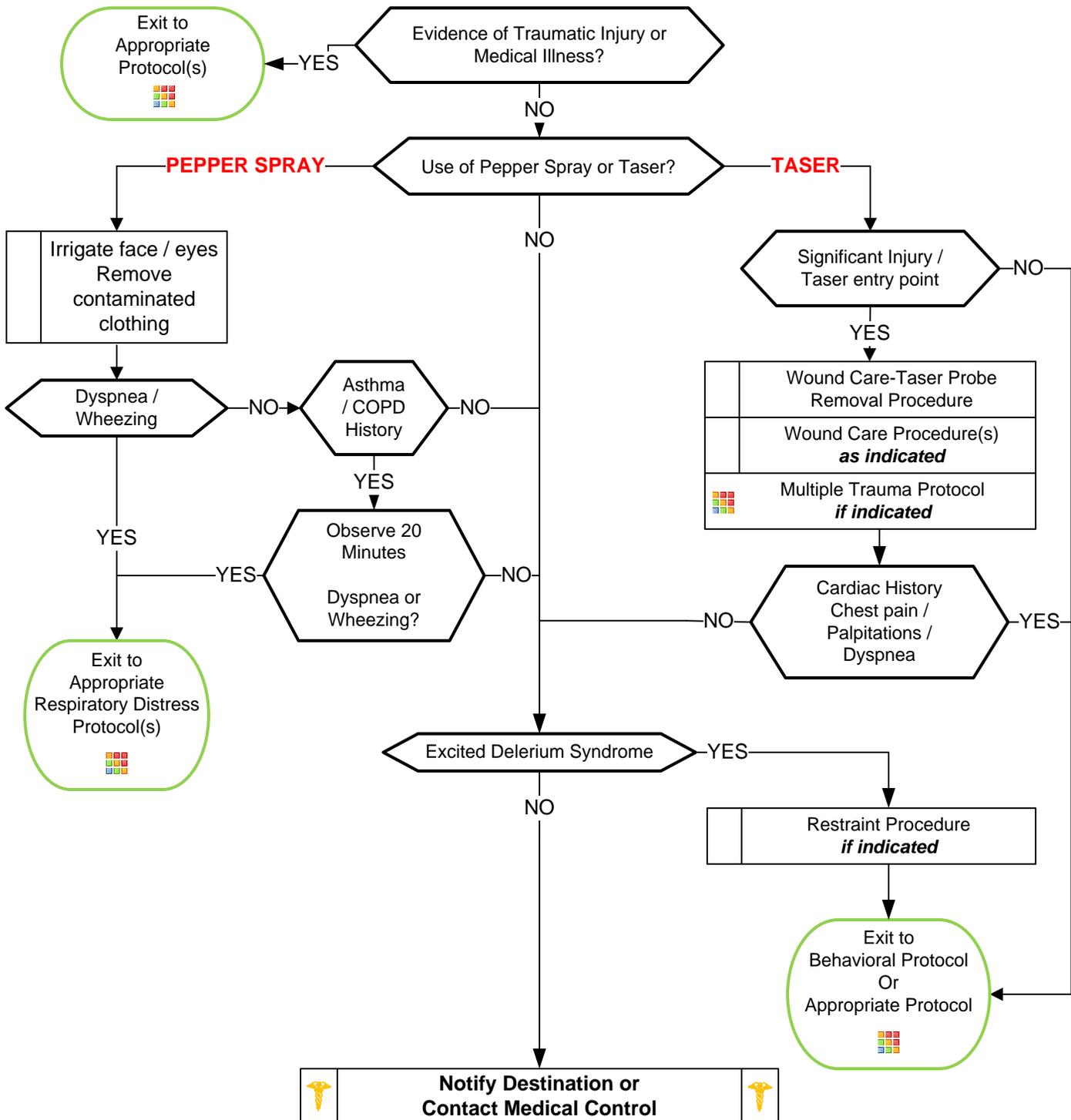
- Traumatic Injury
- Drug Abuse
- Cardiac History
- History of Asthma
- Psychiatric History

Signs and Symptoms

- External signs of trauma
- Palpitations
- Shortness of breath
- Wheezing
- Altered Mental Status
- Intoxication/Substance Abuse

Differential

- Agitated Delirium Secondary to Psychiatric Illness
- Agitated Delirium Secondary to Substance Abuse
- Traumatic Injury
- Closed Head Injury
- Asthma Exacerbation
- Cardiac Dysrhythmia



Adult / Pediatric General Section Protocols



Police Custody



Pearls

- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- Local EMS agencies should formulate a policy with local law enforcement agencies concerning patients requiring EMS and Law Enforcement simultaneously. Agencies should work together to formulate a disposition in the best interest of the patient.
- **Patients restrained by law enforcement devices must be transported accompanied by a law enforcement officer in the patient compartment who is capable of removing the devices. However when rescuers have utilized restraints in accordance with Restraint Procedure, the law enforcement agent may follow behind the ambulance during transport.**
- The responsibility for patient care rests with the highest authorized medical provider on scene per North Carolina law.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- All patients in police custody retain the right to participate in decision making regarding their care and may request care of EMS.
- If extremity / chemical / law enforcement restraints are applied, follow Restraint Procedure.
- **Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- **Excited Delirium Syndrome:**
 - Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers.
 - Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents.
 - Alcohol withdrawal or head trauma may also contribute to the condition.
- If patient is suspected of excited delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status.



Emergencies Involving Indwelling Central Lines



History

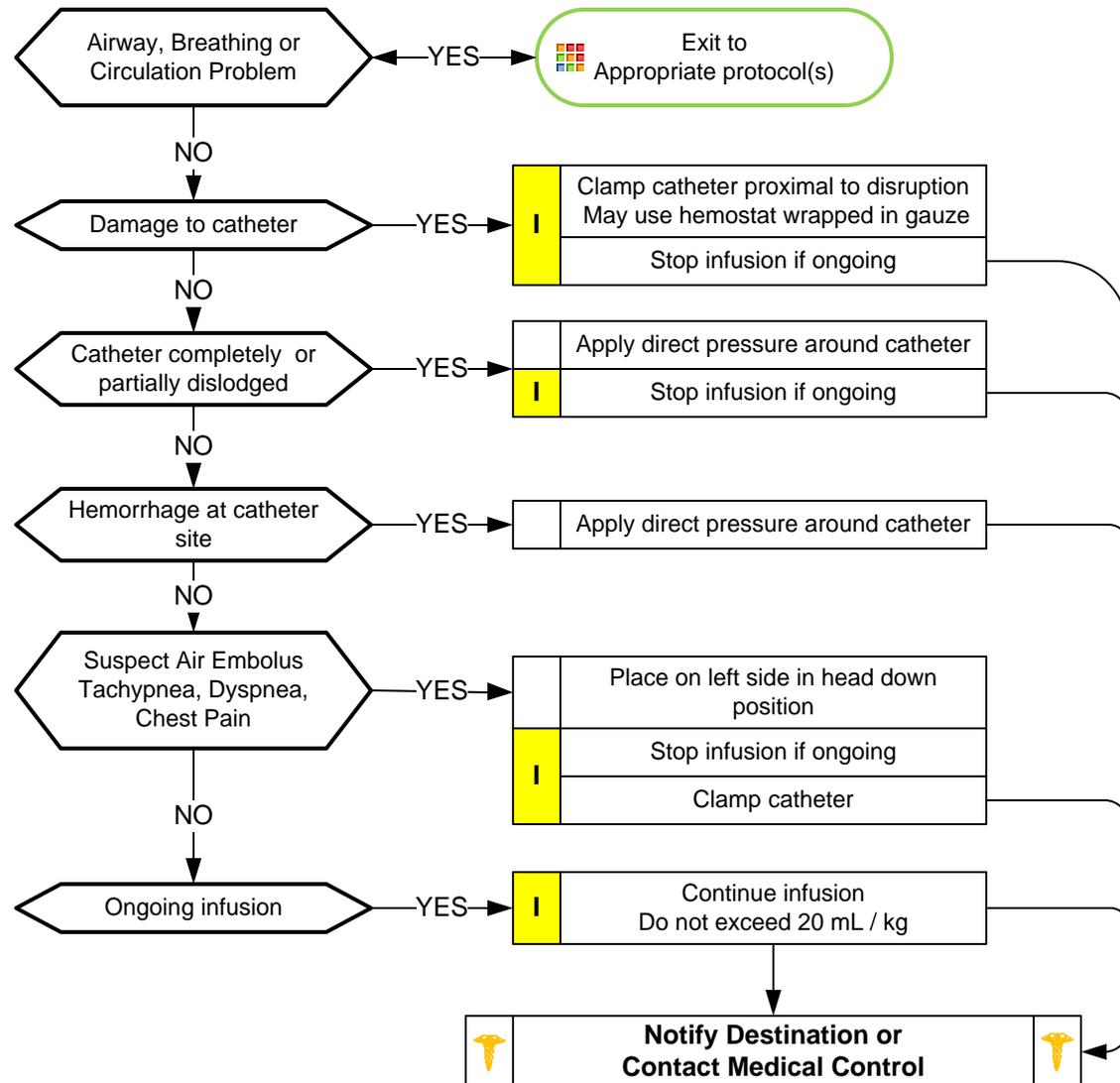
- Central Venous Catheter Type
Tunneled Catheter (Broviac / Hickman)
- PICC (peripherally inserted central catheter)
- Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

Signs and Symptoms

- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter site
- Internal bleeding
- Blood clot
- Air embolus
- Erythema, warmth or drainage about catheter site indicating infection

Differential

- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock



Adult / Pediatric General Section Protocols

Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Use strict sterile technique when accessing / manipulating an indwelling catheter.
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Cardiac arrest: Access central catheter and utilize if functioning properly.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.



Respiratory Distress With a Tracheostomy Tube



History

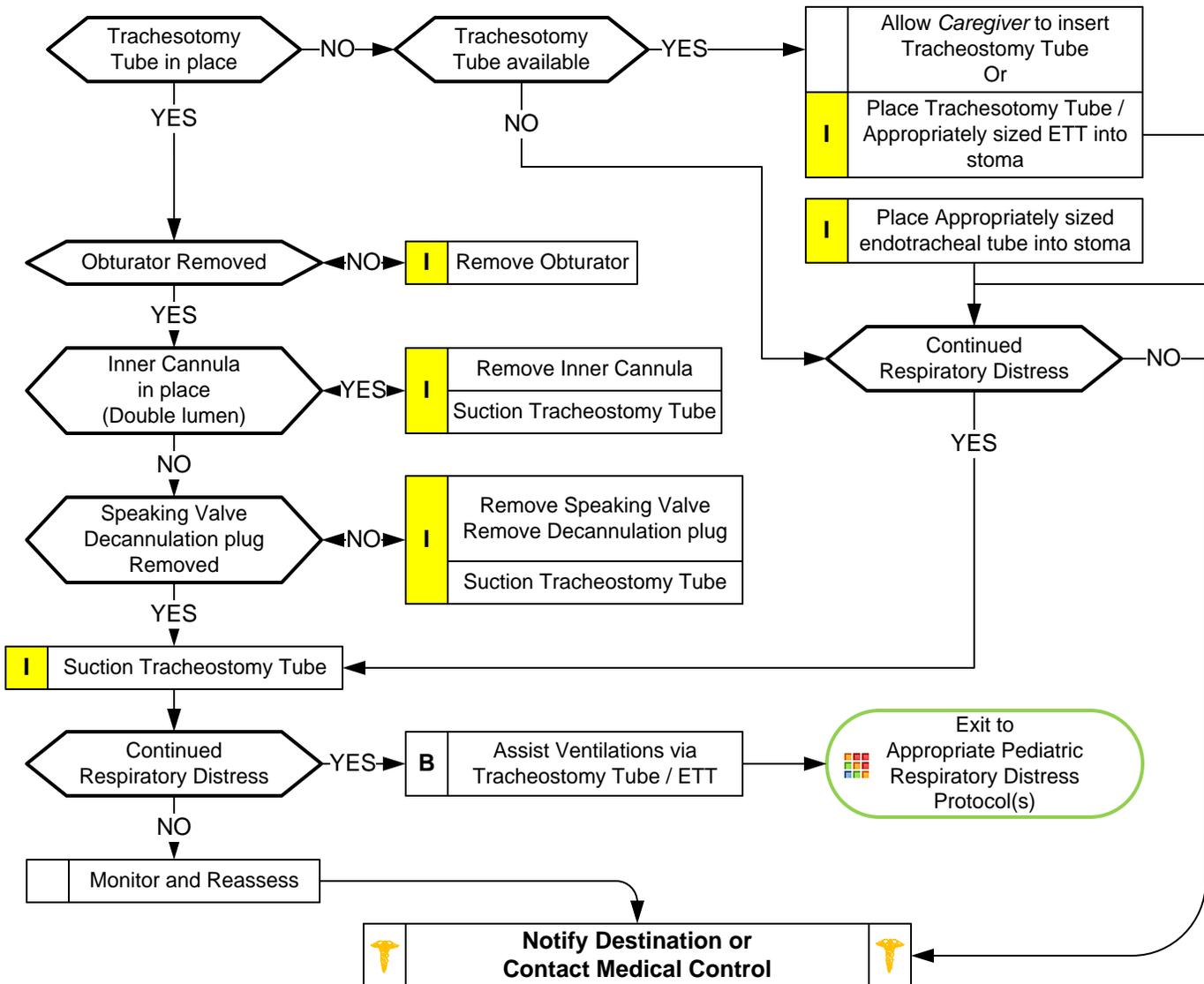
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (accidental damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchial or pulmonary dysplasia, muscular dystrophy)

Signs and Symptoms

- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions noted coming out of the tube
- Faint breath sounds on both sides of chest despite significant respiratory effort
- AMS
- Cyanosis

Differential

- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma



Adult / Pediatric General Section Protocols

Pearls

- Always talk to family / caregivers as they have specific knowledge and skills.
- Use patients equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family / caregiver. No more than 3 to 6 cm typically. Instill 2 – 3 mL of NS before suctioning.
- Do not suction more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Continual pulse oximetry and EtCO₂ monitoring if available.
- **DOPE:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.



Emergencies Involving Ventilators



History

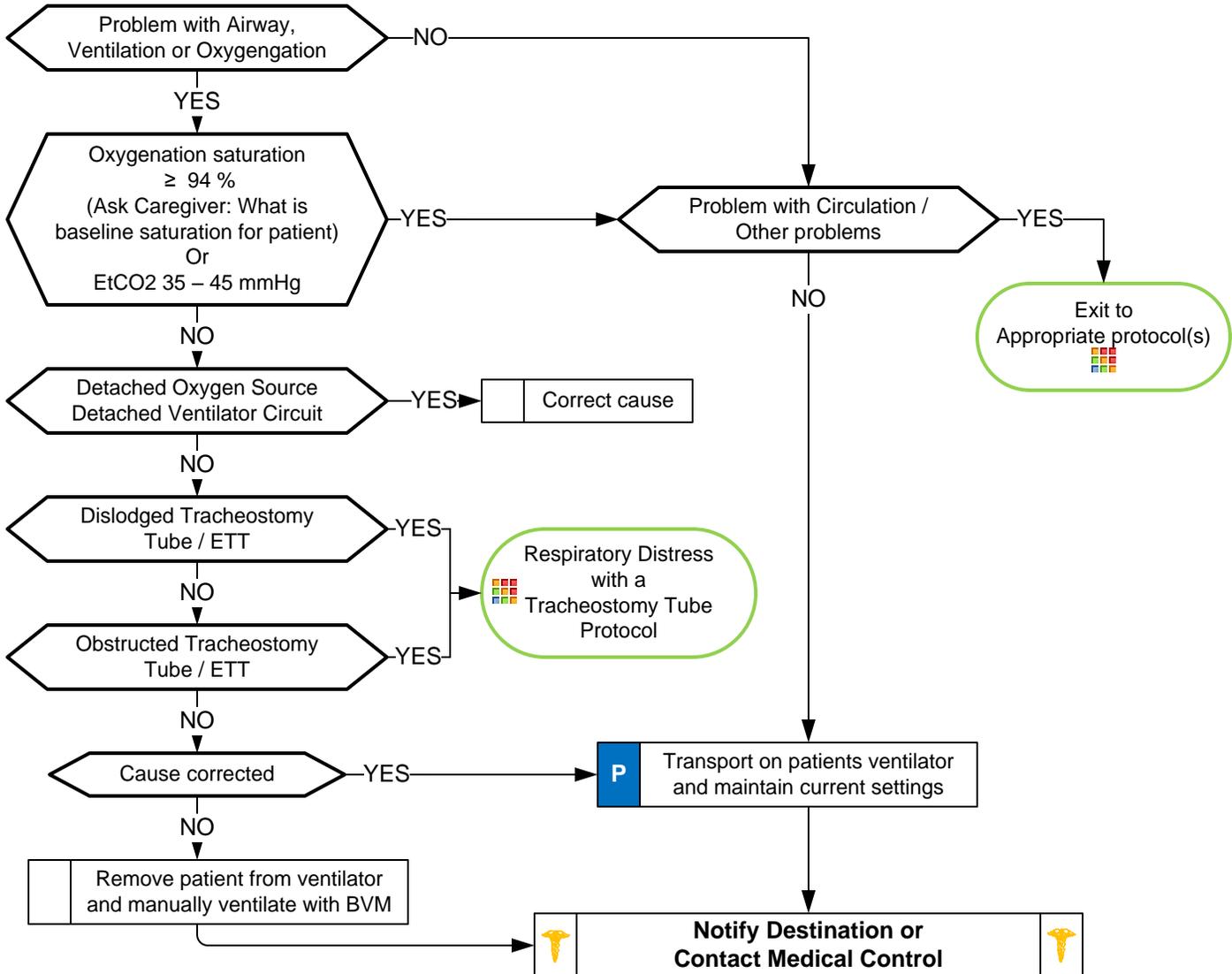
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchopulmonary dysplasia, muscular dystrophy)

Signs and Symptoms

- Transport requiring maintenance of a mechanical ventilator
- Power or equipment failure at residence

Differential

- Disruption of oxygen source
- Dislodged or obstructed tracheostomy tube
- Detached or disrupted ventilator circuit
- Cardiac arrest
- Increased oxygen requirement / demand
- Ventilator failure



Adult / Pediatric General Section Protocols

Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Always use patient's equipment if available and functioning properly.
- Continuous pulse oximetry and end tidal CO2 monitoring must be utilized during assessment and transport.
- **DOPE: Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.**
- Unable to correct ventilator problem: Remove patient from ventilator and manually ventilate using BVM. Take patient's ventilator to hospital even if not functioning properly.
- Typical alarms:
 - Low Pressure / Apnea: Loose or disconnected circuit, leak in circuit or around tracheostomy site.
 - Low Power: Internal battery depleted.
 - High Pressure: Plugged / obstructed airway or circuit.

This protocol is intentionally left blank for future expansion



Bites and Envenomations



History

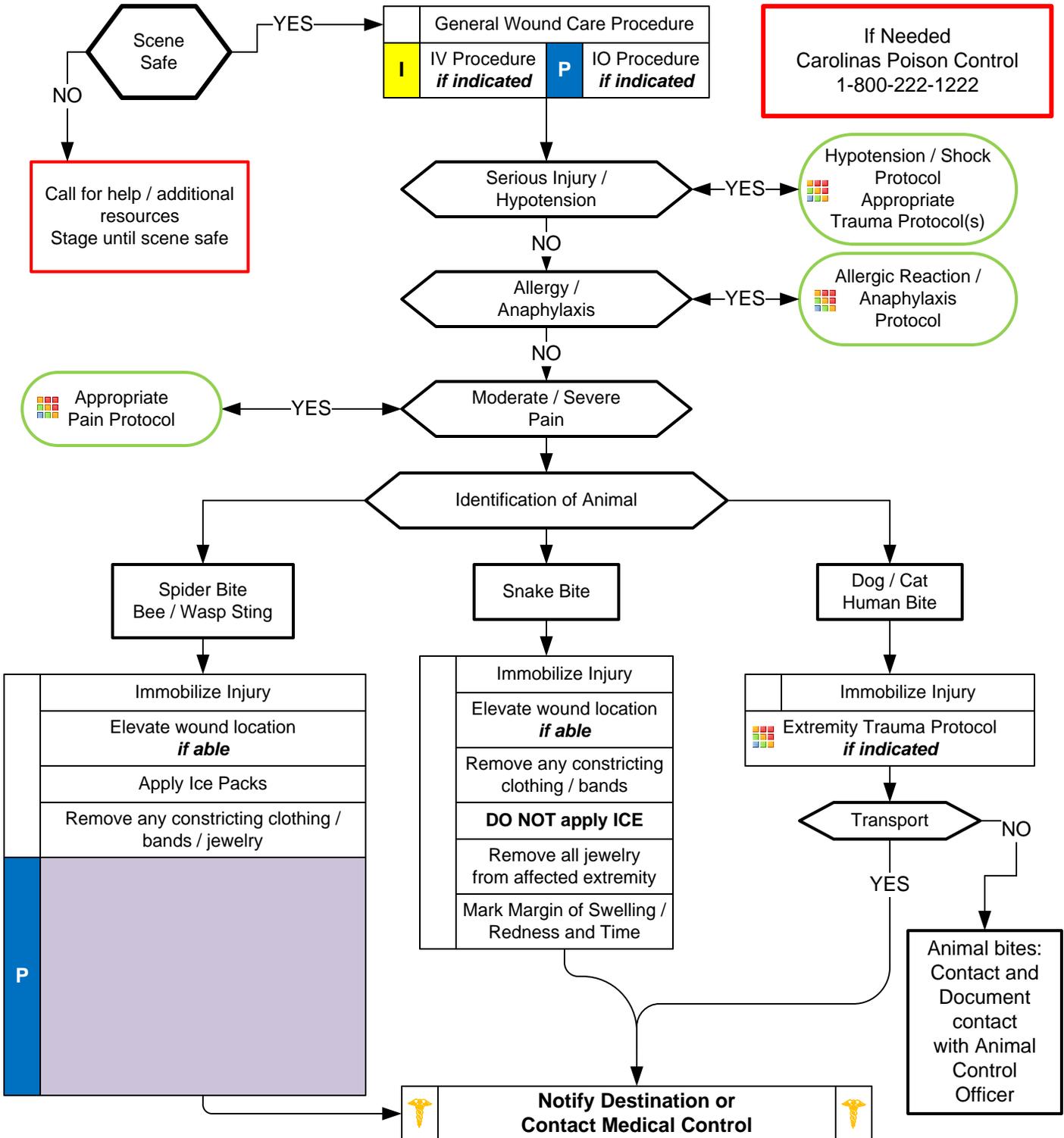
- Type of bite / sting
- Description or bring creature / photo with patient for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

Signs and Symptoms

- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

Differential

- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk



Adult / Pediatric Environmental Section Protocols



Bites and Envenomations



Pearls

- **Recommended Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neuro exam if systemic effects are noted**
- Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria (*Pasteurella multocoda*).
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead.
- Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
- Amount of envenomation is variable, generally worse with larger snakes and early in spring.
- If no pain or swelling, envenomation is unlikely. About 25 % of snake bites are "dry" bites.
- Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplant patients.
- Consider contacting the North Carolina Poison Control Center for guidance (1-800-84-TOXIN).



Carbon Monoxide / Cyanide



History

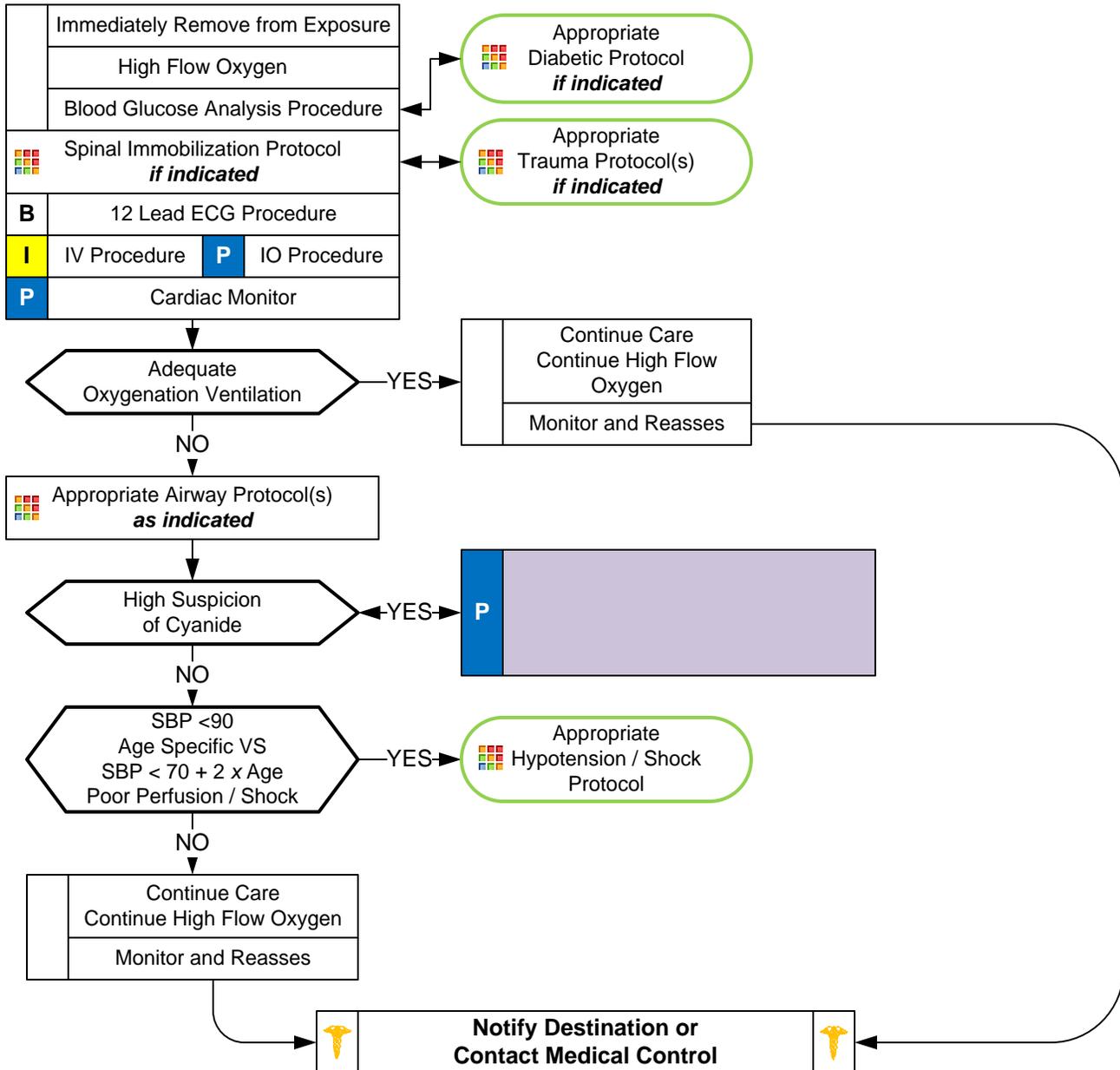
- Smoke inhalation
- Ingestion of cyanide
- Eating large quantity of fruit pits
- Industrial exposure
- Trauma
- Reason: Suicide, criminal, accidental
- Past Medical History
- Time / Duration of exposure

Signs and Symptoms

- AMS
- Malaise, weakness, flu like illness
- Dyspnea
- GI Symptoms; N/V; cramping
- Dizziness
- Seizures
- Syncope
- Reddened skin
- Chest pain

Differential

- Diabetic related
- Infection
- MI
- Anaphylaxis
- Renal failure / dialysis problem
- Head injury / trauma
- Co-ingestant or exposures



Adult / Pediatric Environmental Section Protocols

Pearls

- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority.**
- Consider CO and Cyanide with any product of combustion
- Normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse ox readings.



Drowning



History

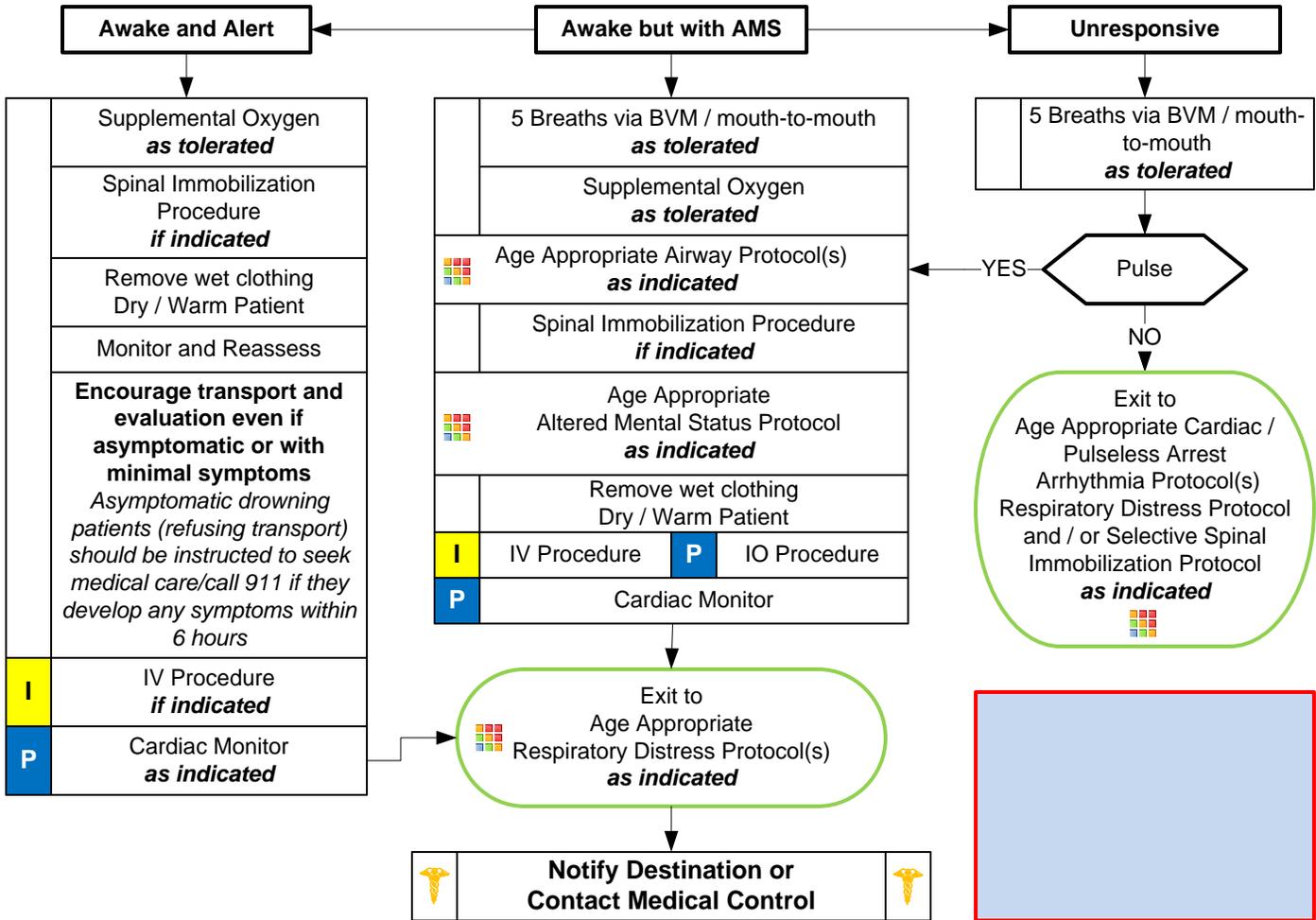
- Submersion in water regardless of depth
- Possible history of trauma
Slammed into shore wave break
- Duration of submersion / immersion
- Temperature of water or possibility of hypothermia

Signs and Symptoms

- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Foaming / Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor
- Apnea

Differential

- Trauma
- Pre-existing medical problem
Hypoglycemia
Cardiac Dysrhythmia
- Pressure injury (SCUBA diving)
Barotrauma
Decompression sickness
- Post-immersion syndrome



Adult / Pediatric Environmental Section Protocols

Pearls

- **Recommended Exam: Respiratory, Mental status, Trauma Survey, Skin, Neuro**
- **Drowning is the process of experiencing respiratory impairment (any respiratory symptom) from submersion / immersion in a liquid.**
- **Begin with BVM ventilations, if patient does not tolerate then apply appropriate mode of supplemental oxygen.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **When feasible, only appropriately trained and certified rescuers should remove patients from areas of danger.**
- **Regardless of water temperature – resuscitate all patients with known submersion time of ≤ 25 minutes.**
- **Regardless of water temperature – If submersion time ≥ 1 hour consider moving to recovery phase instead of rescue.**
- **Foam is usually present in airway and may be copious, DO NOT waste time attempting to suction. Ventilate with BVM through foam (suction water and vomit only when present.)**
- **Cardiac arrest in drowning is caused by hypoxia, airway and ventilation are equally important to high-quality CPR.**
- **Encourage transport of all symptomatic patients (cough, foam, dyspnea, abnormal lung sounds, hypoxia) due to potential worsening over the next 6 hours.**
- Predicting prognosis in prehospital setting is difficult and does not correlate with mental status. Unless obvious death, transport.
- Hypothermia is often associated with drowning and submersion injuries even with warm ambient conditions.
- Drowning patient typically has <1 – 3 mL/kg of water in lungs (does not require suction.) Primary treatment is reversal of hypoxia.
- Spinal immobilization is usually unnecessary. When indicated it should not interrupt ventilation, oxygenation and / or CPR.

Hyperthermia

History

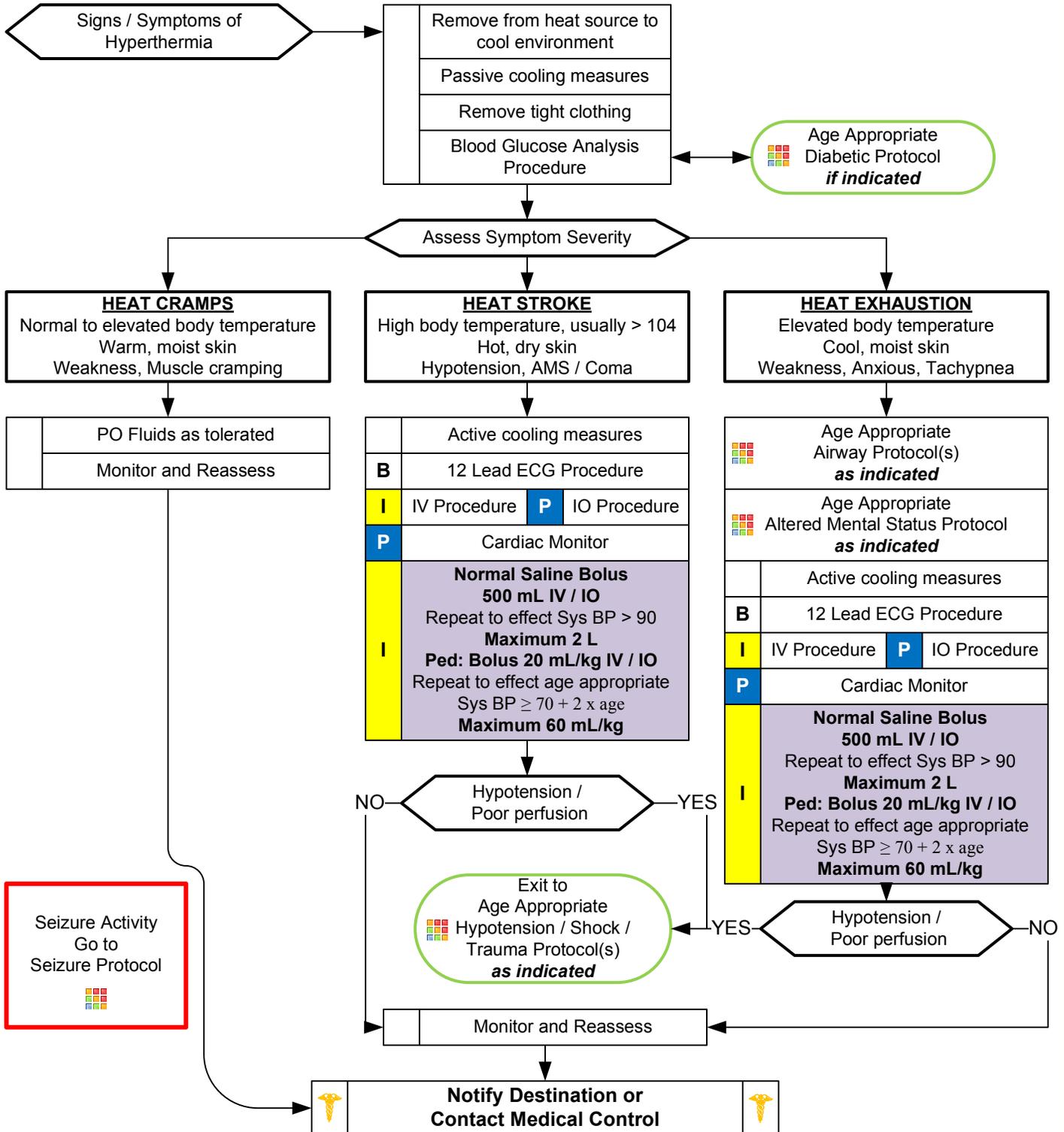
- Age, very young and old
- Exposure to increased temperatures and / or humidity
- Past medical history / Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

Signs and Symptoms

- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential

- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism (Storm)
- Delirium tremens (DT's)
- Heat cramps, exhaustion, stroke
- CNS lesions or tumors



Hyperthermia

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.
- Obtain core temperature via rectal probe in suspected extreme hyperthermia emergencies
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Sweating generally disappears as body temperature rises above 104° F (40° C).
- Intense shivering may occur as patient is cooled.
- **Heat Cramps** consists of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion** consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of dehydration, tachycardia, hypotension, temperature >104° F (40° C), and an altered mental status.



Hypothermia / Frostbite



History

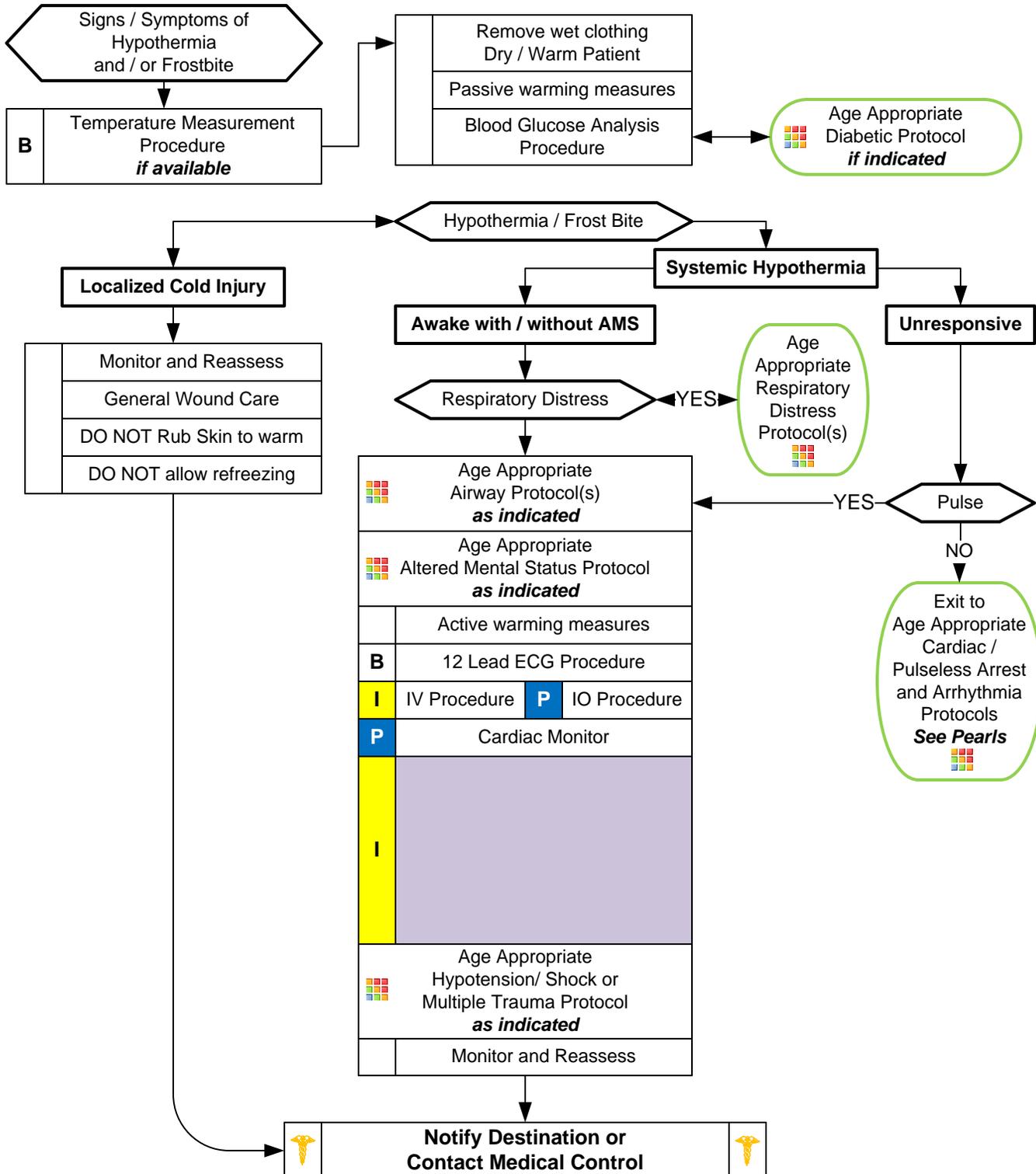
- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections / Sepsis
- Length of exposure / Wetness / Wind chill

Signs and Symptoms

- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential

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



Adult / Pediatric Environmental Section Protocols



Hypothermia / Frostbite



Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature \geq 93.2 degrees F, 32 degrees C.)**
- **Hypothermia categories:**
 - Mild 90 – 95 degrees F (32 – 35 degrees C)
 - Moderate 82 – 90 degrees F (28 – 32 degrees C)
 - Severe < 82 degrees F (< 28 degrees C)
- **Mechanisms of hypothermia:**
 - Radiation: Heat loss to surrounding objects via infrared energy (60 % of most heat loss.)
 - Convection: Direct transfer of heat to the surrounding air.
 - Conduction: Direct transfer of heat to direct contact with cooler objects (important in submersion.)
 - Evaporation: Vaporization of water from sweat or other body water losses.
- Contributing factors of hypothermia: Extremes of age, malnutrition, alcohol or other drug use.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- **CPR:**
 - Severe hypothermia may cause cardiac instability and rough handling of the patient theoretically can cause ventricular fibrillation. This has not been demonstrated or confirmed by current evidence. Intubation and CPR techniques should not be with-held due to this concern.**
 - Intubation can cause ventricular fibrillation so it should be done gently by most experienced person.**
 - Below 86 degrees F (30 degrees C) antiarrhythmics may not work and if given should be given at reduced intervals. Contact medical control for direction. Epinephrine / Vasopressin can be administered. Below 86 degrees F (30 degrees) pacing should not be done**
 - Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.**
 - If the patient is below 86 degrees F (30 degree C) then defibrillate 1 time if defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact medical control for direction.**
 - Hypothermia may produce severe bradycardia so take at least 45 second to palpate a pulse.**
- Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.



Marine Envenomations / Injury



History

- Type of bite / sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

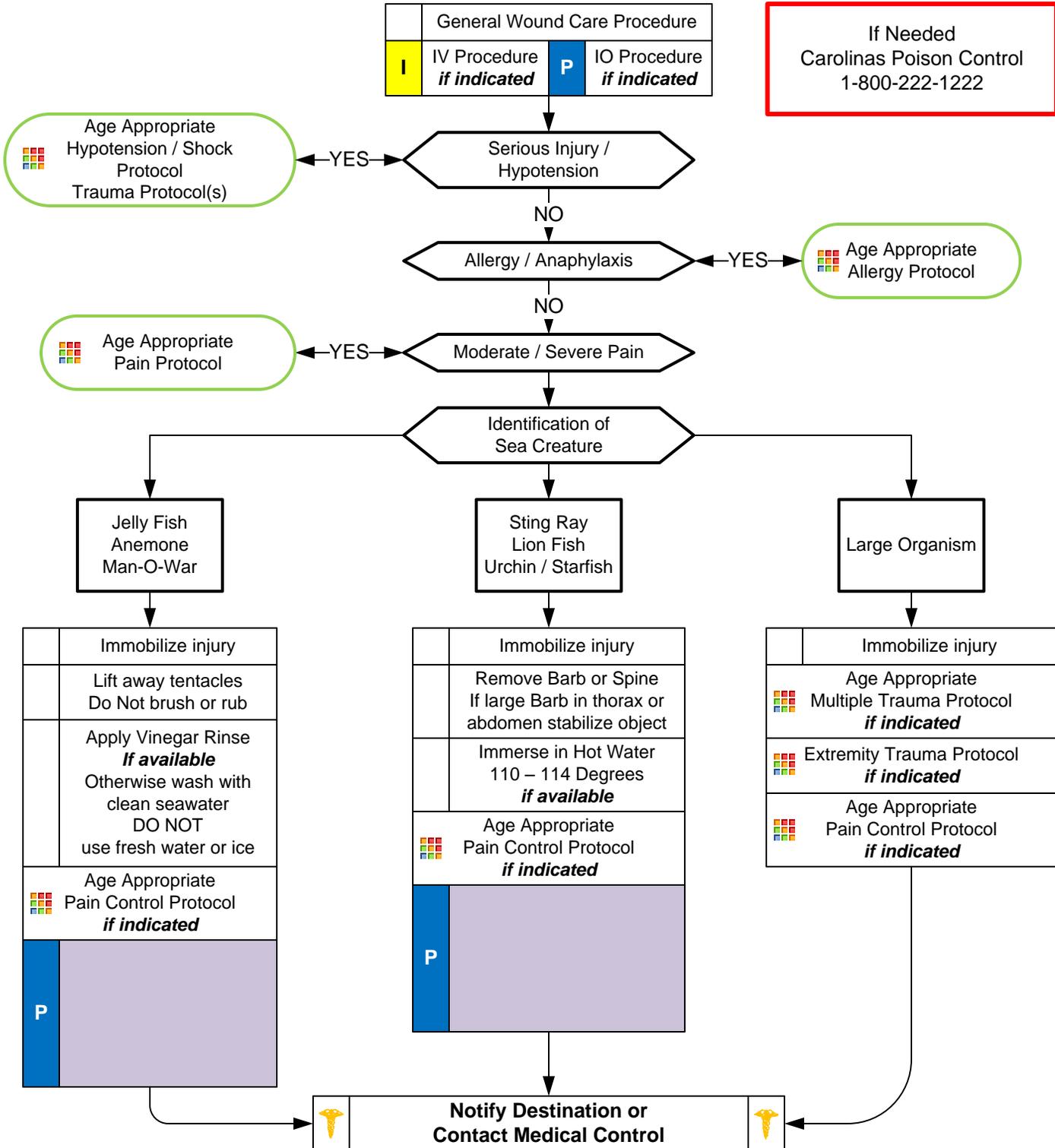
Signs and Symptoms

- Intense localized pain
- Increased oral secretions
- Nausea / vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

Differential

- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting

If Needed
Carolinas Poison Control
1-800-222-1222



Adult / Pediatric Environmental Section Protocols

Protocol 83



Marine Envenomations / Injury



Pearls

- Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting / injury.
- Patients can suffer cardiovascular collapse from both the venom and / or anaphylaxis even in seemingly minor envenomations.
- Sea creature stings and bites impart moderate to severe pain.
- Arrest the envenomation by inactivation of the venom as appropriate.
- Ensure good wound care, immobilization and pain control.



WMD-Nerve Agent Protocol



History

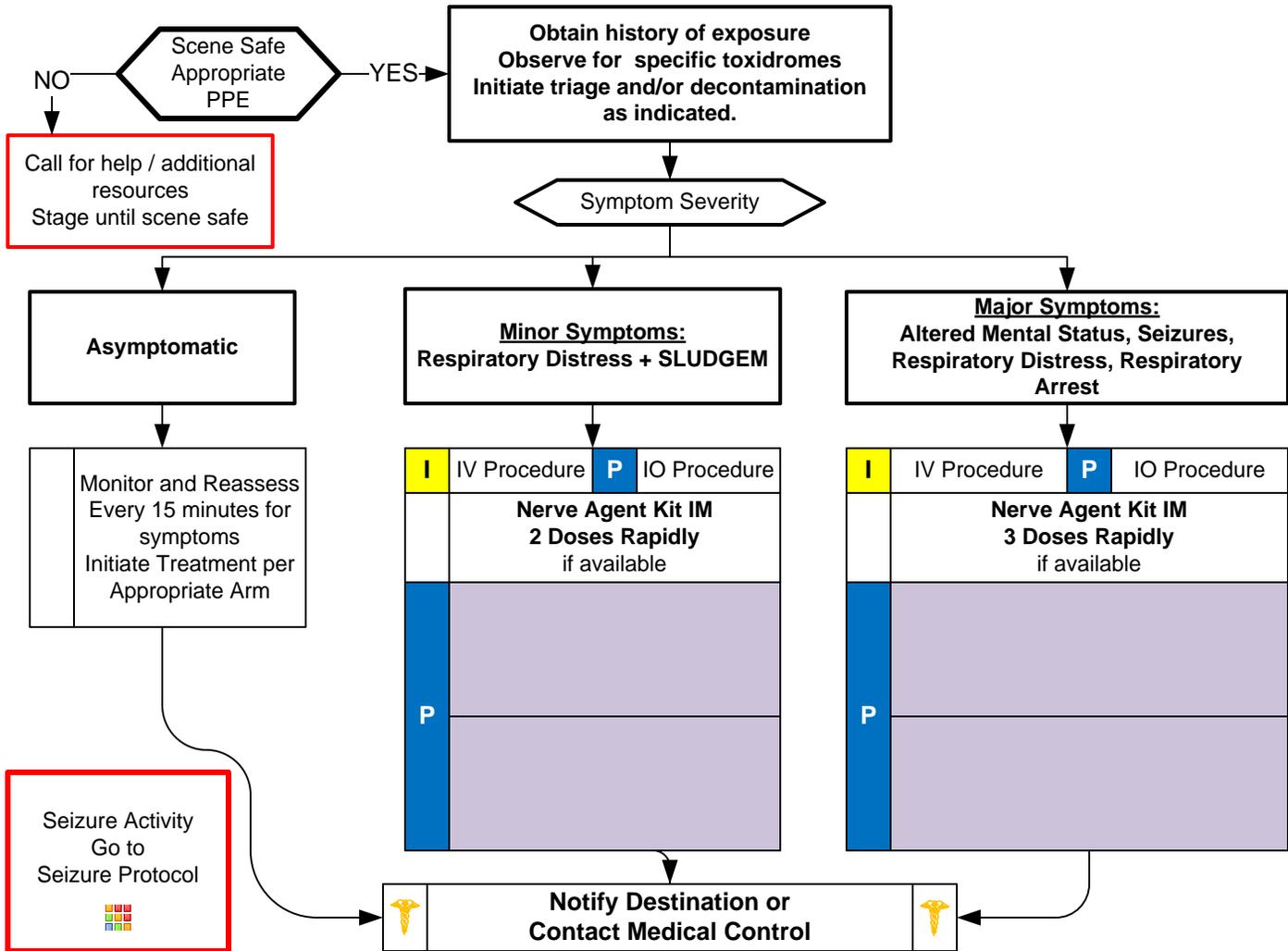
- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard

Signs and Symptoms

- **S**alivation
- **L**acrimation
- **U**rination; increased, loss of control
- **D**efecation / Diarrhea
- **G**I Upset; Abdominal pain / cramping
- **E**mesis
- **M**uscle Twitching
- Seizure Activity
- Respiratory Arrest

Differential

- Nerve agent exposure (e.g., VX, Sarin, Soman, etc.)
- Organophosphate exposure (pesticide)
- Vesicant exposure (e.g., Mustard Gas, etc.)
- Respiratory Irritant Exposure (e.g., Hydrogen Sulfide, Ammonia, Chlorine, etc.)



Adult / Pediatric Environmental Section Protocols

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Gastrointestinal, Neuro**
- **Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
- **In the face of a bona fide attack, begin with 1 Nerve Agent Kit for patients less than 7 years of age, 2 Nerve Agent Kits from 8 to 14 years of age, and 3 Nerve Agent Kits for patients 15 years of age and over.**
- **If Triage/MCI issues exhaust supply of Nerve Agent Kits, use pediatric atropines (if available). Use the 0.5 mg dose if patient is less than 40 pounds (18 kg), 1 mg dose if patient weighs between 40 to 90 pounds (18 to 40 kg), and 2 mg dose for patients greater than 90 pounds (>40 kg).**
- **Each Nerve Agent Kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine.**
- **Seizure Activity: Any benzodiazepine by any route is acceptable.**
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they not from exposure to another agent (e.g., narcotics, vesicants, etc.)
- The main symptom that the atropine addresses is excessive secretions so atropine should be given until salivation improves.
- EMS personnel, public safety officers and Medical Responders / EMT-B may carry, self-administer or administer to a patient atropine / pralidoxime by protocol. Agency medical director may require Contact of Medical Control prior to administration.

Blank

This protocol is intentionally left blank for future expansion

Blast Injury / Incident

History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Nature of Device: Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.

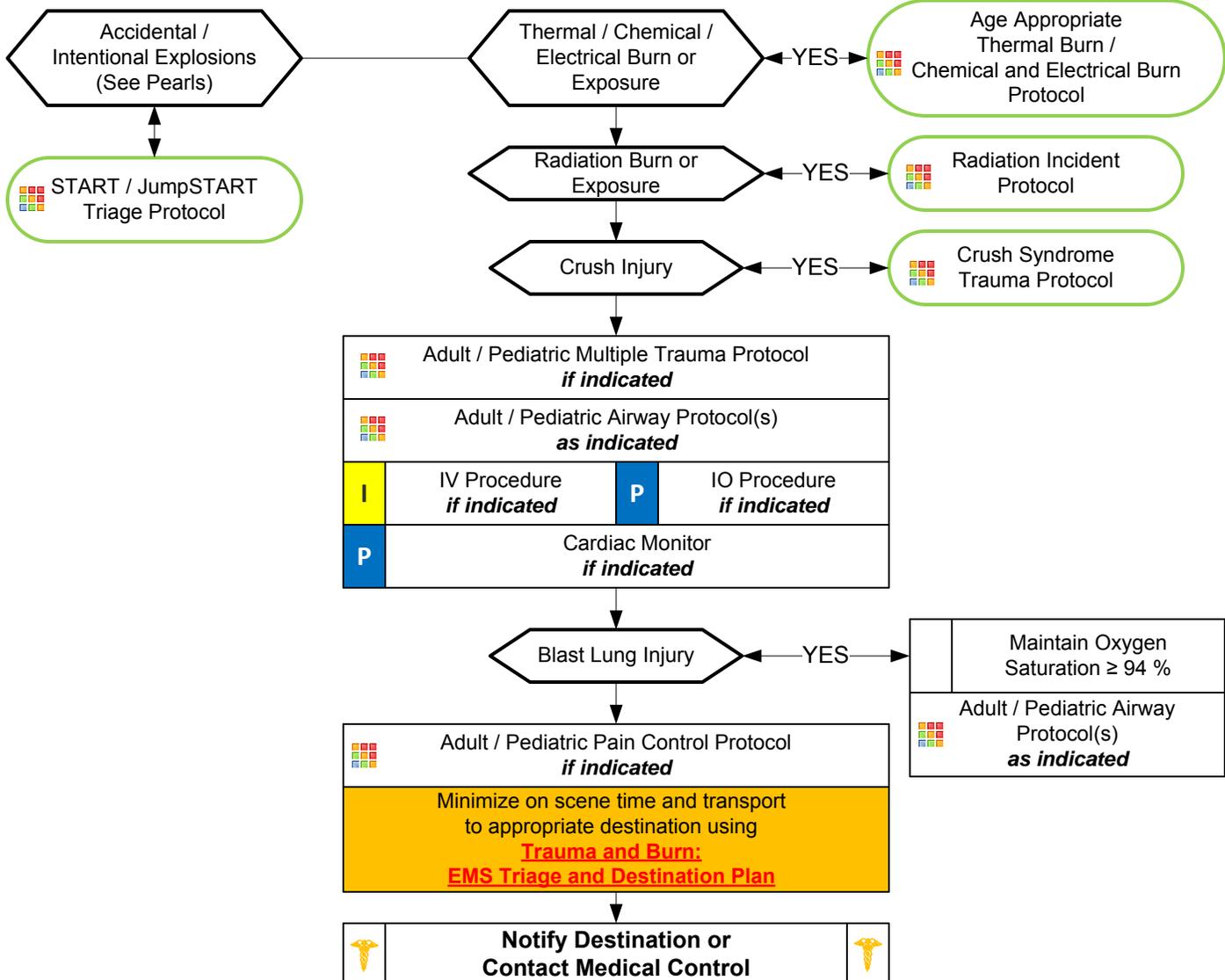
Method of Delivery: Incendiary / Explosive

Nature of Environment: Open / Closed.

Distance from Device: Intervening protective barrier. Other environmental hazards,

Evaluate for: Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute



Blast Injury / Incident

Pearls

- **Types of Blast Injury:**
 - Primary Blast Injury: From pressure wave.
 - Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel.
 - Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.
 - Most Common Cause of Death: Secondary Blast Injuries.
- **Triage of Blast Injury patients:**
 - Blast Injury Patients with Burn Injuries Must be Triageed using the Thermal / Chemical / Electrical Burn Destination Guidelines for Critical / Serious / Minor Trauma and Burns
- **Care of Blast Injury Patients:**
 - Blast Injury Patients with Burn Injuries Must be cared for using the Thermal / Chemical / Electrical Burn Protocols.
 - Use Lactated Ringers (if available) for all Critical or Serious Burns.
- **Blast Lung Injury:**
 - Blast Lung Injury is characterized by respiratory difficulty and hypoxia. Can occur (rarely) in patients without external thoracic trauma. More likely in enclosed space or in close proximity to explosion.
 - Symptoms: Dyspnea, hemoptysis cough, chest pain, wheezing and hemodynamic instability.
 - Signs: Apnea, tachypnea, hypopnea, hypoxia, cyanosis and diminished breath sounds.
 - Air embolism should be considered and patient transported prone and in slight left-lateral decubitus position.
 - Blast Lung Injury patients may require early intubation but positive pressure ventilation may exacerbate the injury, avoid hyperventilation.
 - Air transport may worsen lung injury as well and close observation is mandated. Tension pneumothorax may occur requiring chest decompression. Be judicious with fluids as volume overload may worsen lung injury.
- **Accident Explosions:**
 - Attempt to determine source of the blast to include any potential threat for partialization of hazardous materials.
 - Evaluate scene safety to include the source of the blast that may continue to spill explosive liquids or gases.
 - Consider structural collapse / Environmental hazards / Fire.
 - Conditions that led to the initial explosion may be returning and lead to a second explosion.
 - Patients who can, typically will attempt to move as far away from the explosive source as they safely can.
- **Intentional Explosions:**
 - Attempt to determine source of the blast to include any potential threat for partialization of hazardous materials.
 - Greatest concern is potential threat for a secondary device.
 - Evaluate surroundings for suspicious items; unattended back packs or packages, or unattended vehicles.
 - If patient is unconscious or there is(are) fatality(fatalities) and you are evaluating patient(s) for signs of life: Before moving note if there are wires coming from the patient(s), or it appears the patient(s) is(are) lying on a package/pack, or bulky item, do not move the patient(s), quickly back away and immediately notify a law enforcement officer.** If no indications the patient is connected to a triggering mechanism for a secondary device, expeditiously remove the patient(s) from the scene and begin transport to the hospital.
 - Protect the airway and cervical spine, however, beyond the primary survey, care and a more detailed assessment should be deferred until the patient is in the ambulance.
 - If there are signs the patient was carrying the source of the blast, notify law enforcement immediately and most likely, a law enforcement officer will accompany your patient to the hospital.
 - Consider the threat of structural collapse, contaminated particles and / or fire hazards.



Chemical and Electrical Burn



History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

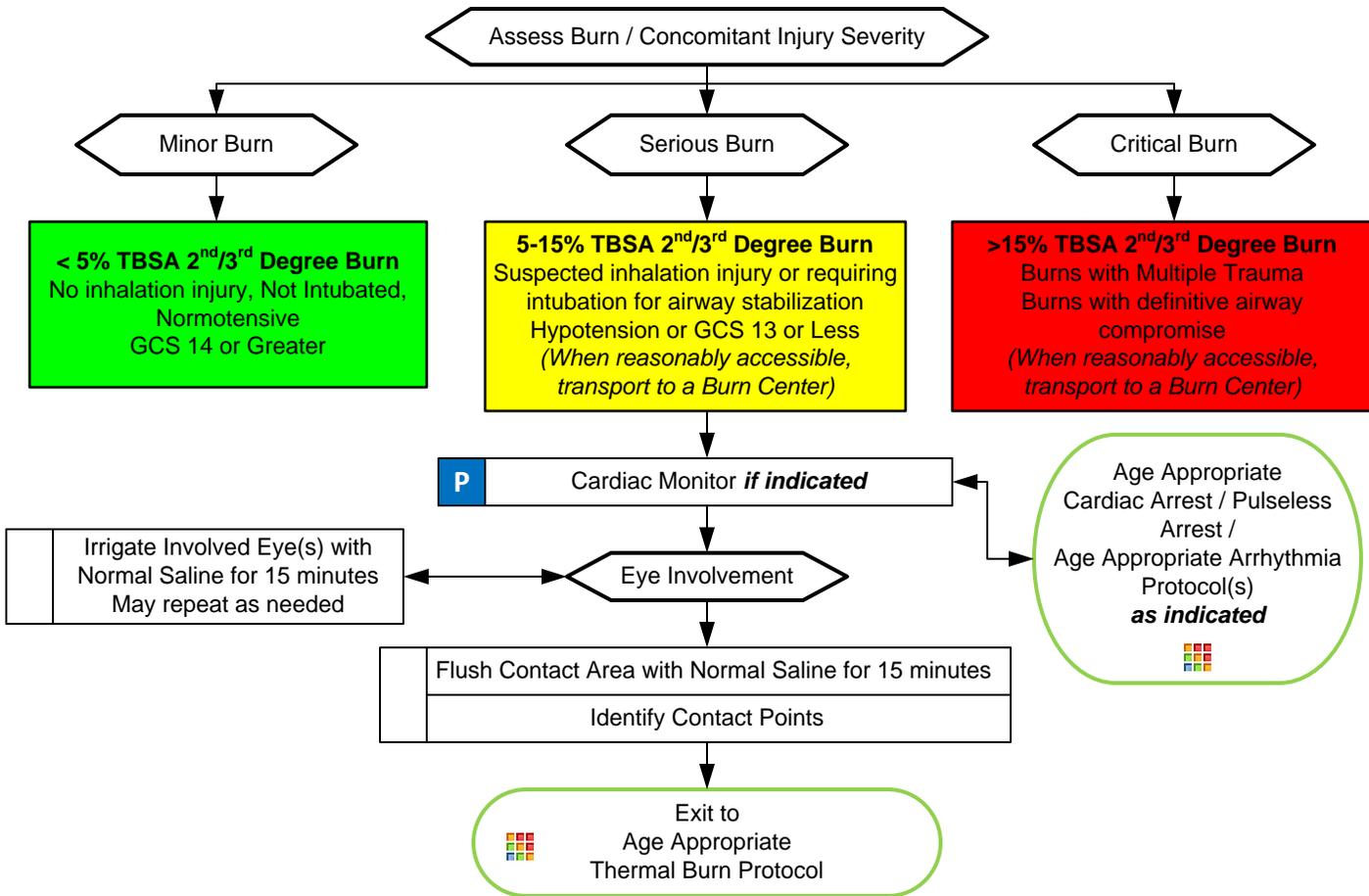
Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assure Chemical Source is NOT Hazardous to Responders.
Assure Electrical Source is NO longer in contact with patient before touching patient.



Adult / Pediatric Trauma and Burn Section Protocols

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source, does not always reflect more extensive internal damage not seen.**
- **Chemical Burns:**
Refer to Decontamination Procedure.
Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Electrical Burns:**
DO NOT contact patient until you are certain the source of the electrical shock is disconnected.
Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded. Sites will generally be full thickness. **Do not refer to as entry and exit sites or wounds.**
Cardiac Monitor: Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation and / or heart blocks.
Attempt to identify then nature of the electrical source (AC / DC), the amount of voltage and the amperage the patient may have been exposed to during the electrical shock.

Crush Syndrome Trauma

History

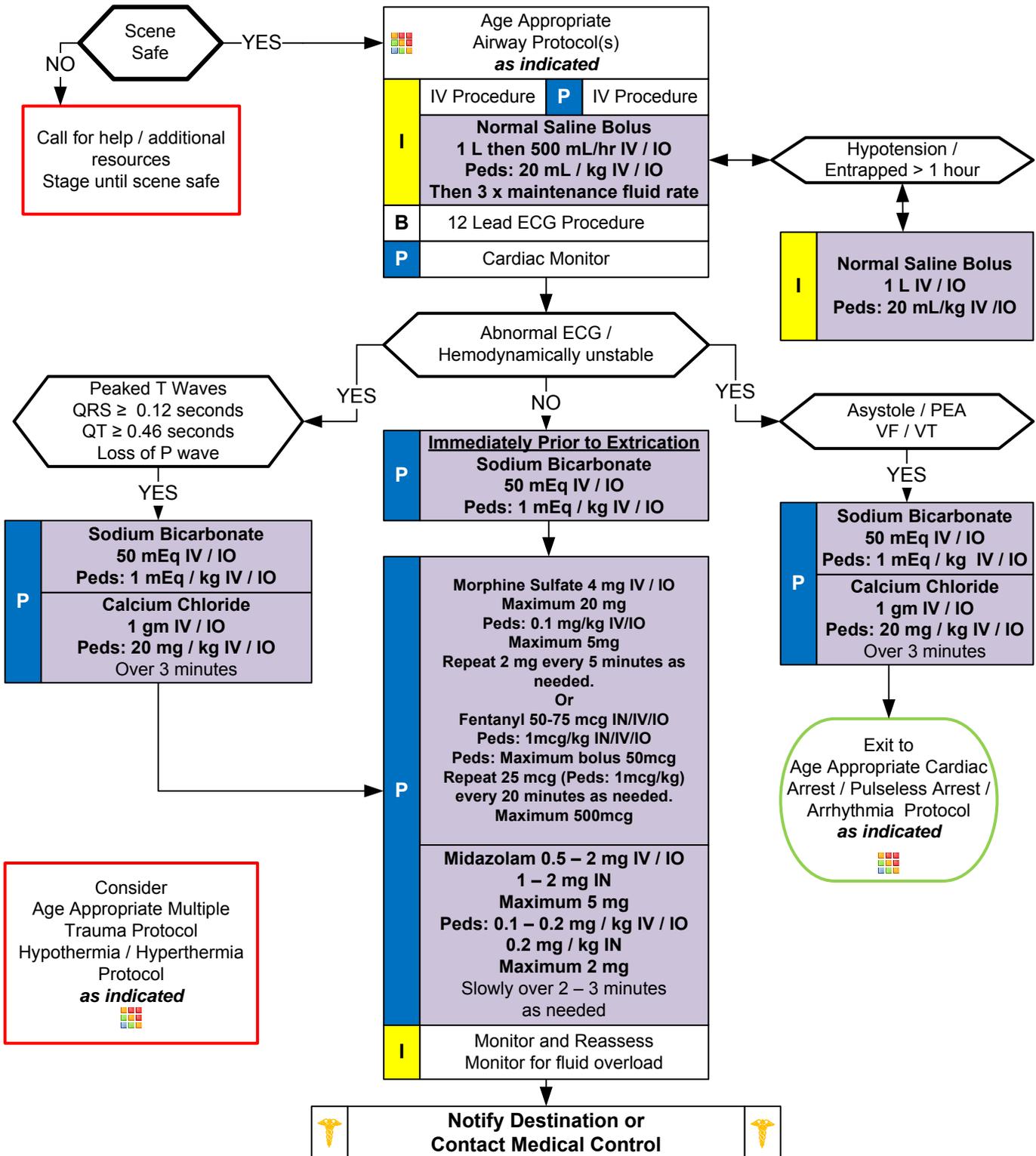
- Entrapped and crushed under heavy load > 30 minutes
- Extremity / body crushed
- Building collapse, trench collapse, industrial accident, pinned under heavy equipment

Signs and Symptoms

- Hypotension
- Hypothermia
- Abnormal ECG findings
- Pain
- Anxiety

Differential

- Entrapment without crush syndrome
- Entrapment without significant crush
- Altered mental status



Consider
Age Appropriate Multiple
Trauma Protocol
Hypothermia / Hyperthermia
Protocol
as indicated

Adult / Pediatric Trauma and Burn Section Protocols

Crush Syndrome Trauma



Hydromorphone 1-2mg may be given in place of Morphine.

Pearls

- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.**
- Avoid Ringers Lactate IV Solution due to potassium and potential worsening hyperkalemia
- Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also be a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the VF/Pulseless VT Protocol.
- Patients may become hypothermic even in warm environments.
- Pediatric IV Fluid maintenance rate: 4 mL per first 10 kg of weight + 2 mL per second 10 kg of weight + 1 mL for every additional kg in weight.



Extremity Trauma



History

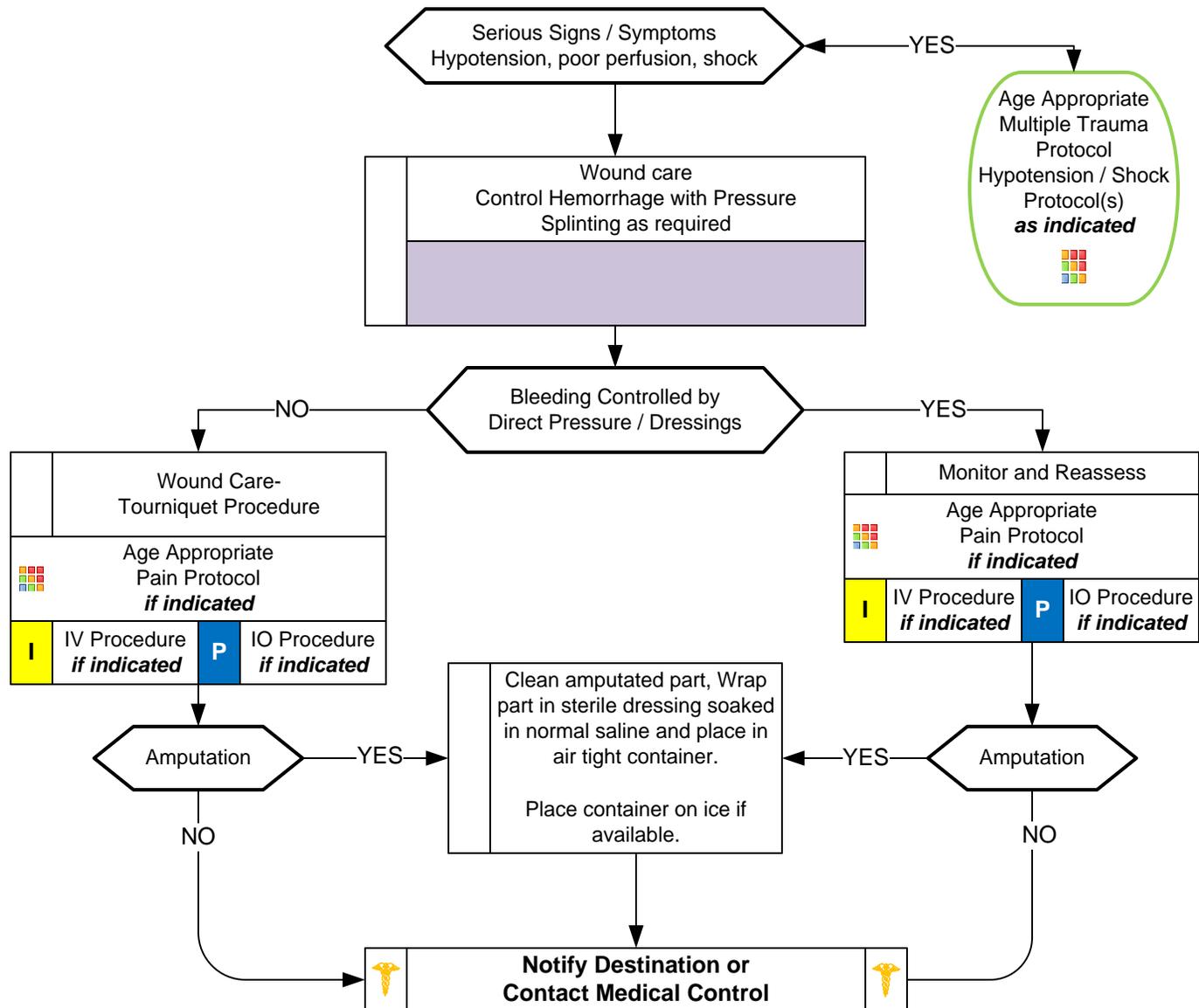
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open vs. closed wound / fracture
- Wound contamination
- Medical history
- Medications

Signs and Symptoms

- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

Differential

- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation

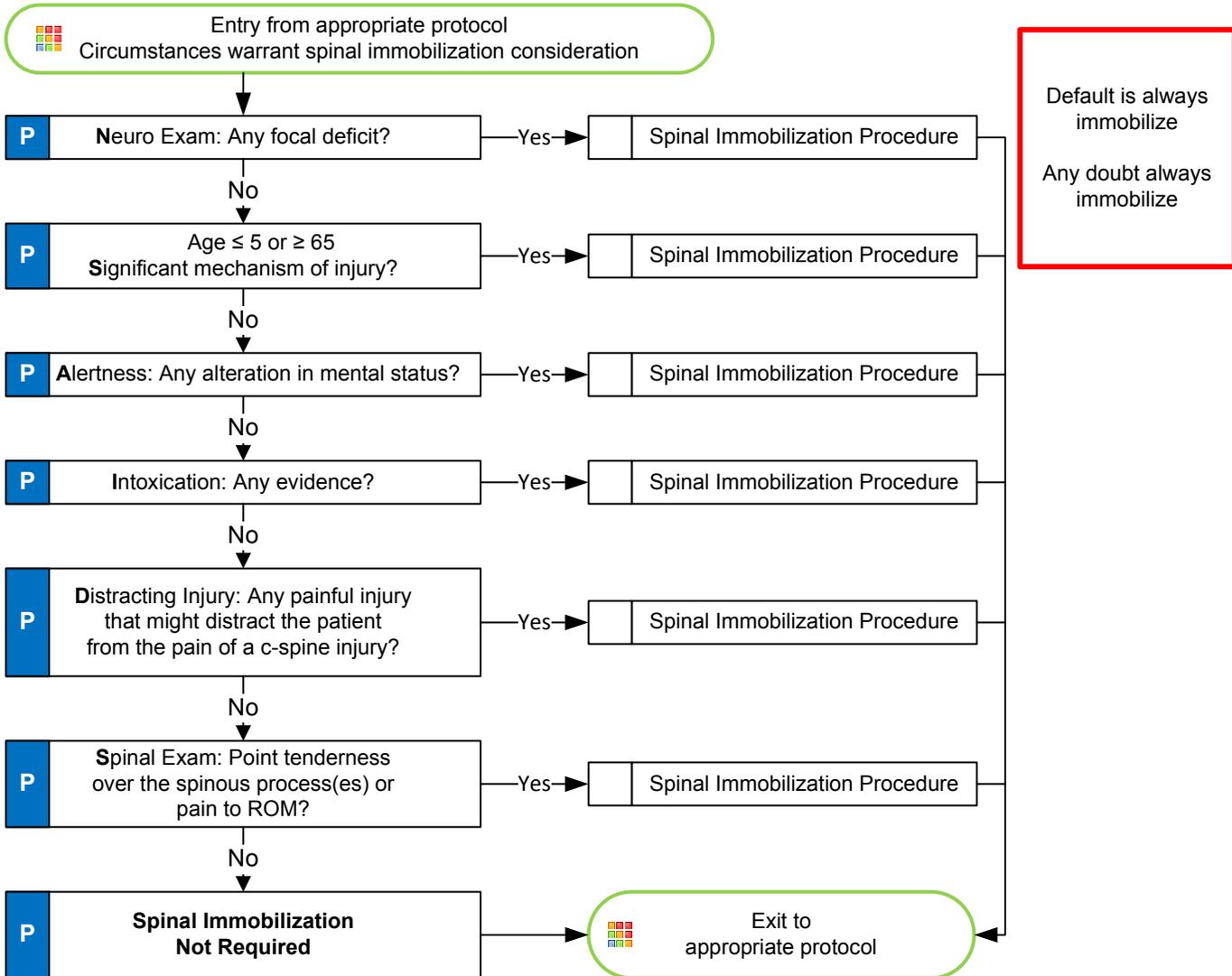


Adult / Pediatric Trauma and Burn Section Protocols

Pearls

- **Recommended Exam: Mental Status, Extremity, Neuro**
- Peripheral neurovascular status is important
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations 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.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- Multiple casualty incident: Tourniquet Procedure may be considered first instead of direct pressure.

Selective Spinal Motion Restriction



Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients meeting all above criteria may be “cleared” from spinal immobilization. However, patients who fail one or more criteria above require spinal stabilization but do NOT always require use of the long spine board (see below).**
- Appropriate use of cervical collar and long spine board includes blunt trauma and AMS, spinal pain or tenderness, neurological signs / symptoms, spine deformity, high-energy mechanism of injury, drug / alcohol use, inability to communicate and / or distracting injury. Use mnemonic “NSAIDS.” Fill all voids with padding during immobilization.
- Consider immobilization in patients with arthritis, cancer, dialysis, underlying spine (spinal surgery) or bone disease.
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for spinal immobilization in the absence of symptoms.
- Range of motion (ROM) is tested by touching chin to chest (look down), extending neck (look up), and turning head from side to side (shoulder to shoulder) without spinal process pain. ROM should NOT be assessed if patient has midline spinal tenderness. Patients range of motion should not be assisted. This is the responsibility of the EMT-Paramedic
- **Immobilization on a long spine board is not necessary where:**
 - Patient has normal LOC with no spine tenderness / deformity, no neurological signs / symptoms, no distracting injury and no intoxication with drugs and / or alcohol.
 - Penetrating trauma to the head, neck or torso with no signs / symptoms of spinal injury.
- **Immobilization may be maintained by cervical collar and securing to EMS stretcher ONLY where:**
 - Patients are found to be ambulatory at the scene.
 - Transport for a protracted time (> 45 minutes) or during an inter-facility transfer
 - Patient where a long spine board is not otherwise indicated.
- When long spine board is not utilized spinal precautions in at-risk patients is paramount. These include cervical collar, securing to stretcher, minimal movement / transfers and maintenance of in-line spine stabilization during any necessary movements / transfers. This includes the elderly or others with body or spine habitus preventing them from lying flat.



Radiation Incident



History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

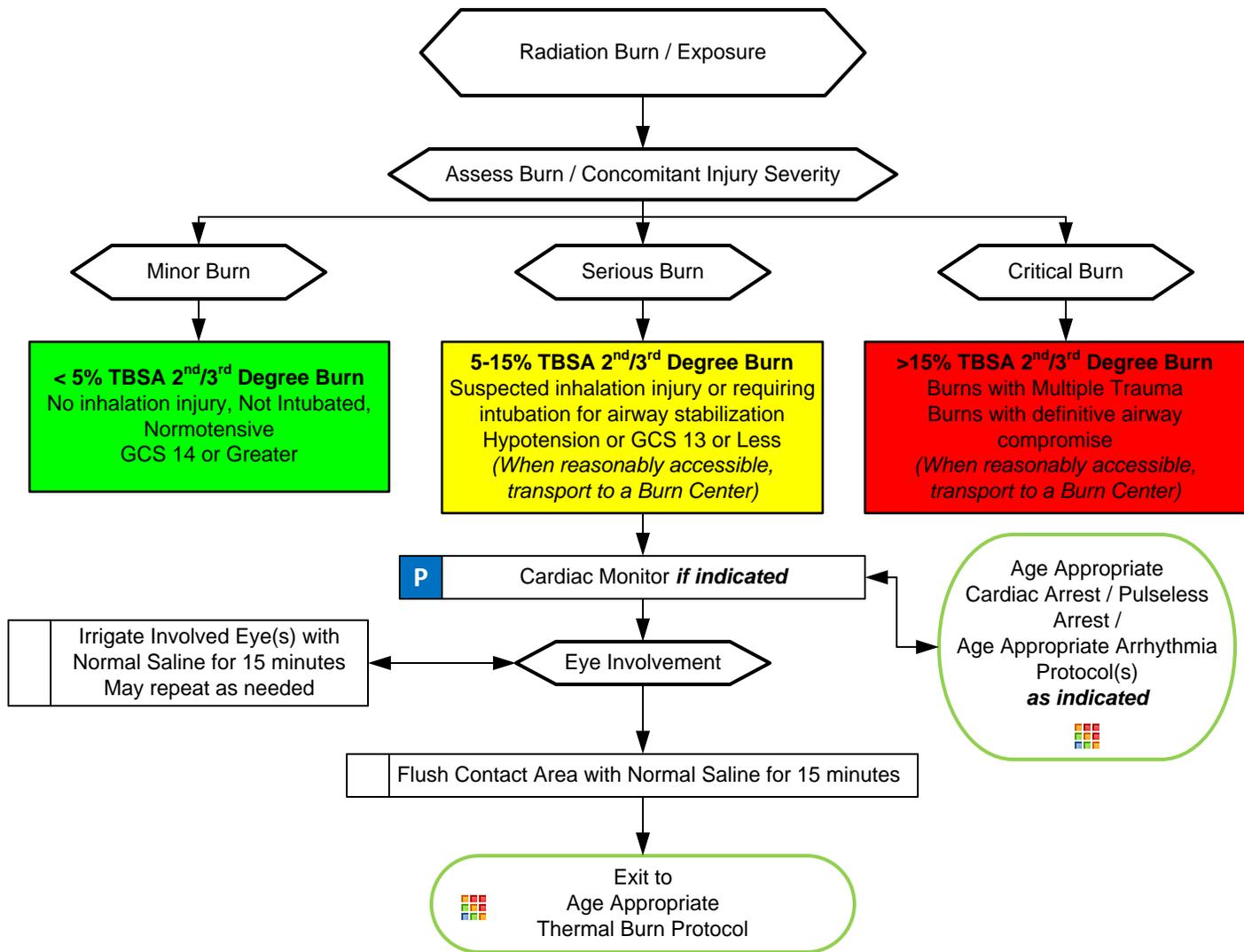
Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute

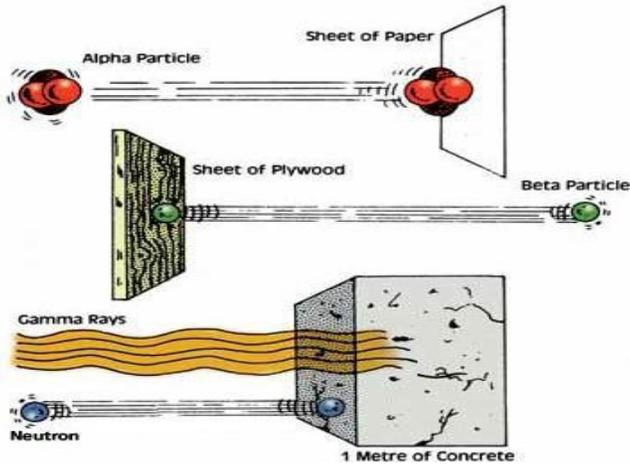


Adult / Pediatric Trauma and Burn Section Protocols

Collateral Injury: Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.

Qualify: Determine exposure type; external irradiation, external contamination with radioactive material, internal contamination with radioactive material.

Quantify: Determine exposure (generally measured in Grays/Gy). Information may be available from those on site who have monitoring equipment, do not delay transport to acquire this information.



Time Phases of Radiation Injury
(Exposure Dose vs Clinical Outcome)

Exposure Dose (Gy)	Prodrome Severity	Manifest Illness - Symptom Severity			Prognosis
		Hematologic	Gastrointestinal	Neurologic	
0.5 to 1.0	+	+	0	0	Survival almost certain
1.0 to 2.0	+ / ++	+	0	0	Survival >90 percent
2.0 to 3.5	++	++	0	0	Probable survival
3.5 to 5.5	+++	+++	+	0	Death in 50% at 3.5 to 6 wks
5.5 to 7.5	+++	+++	++	0	Death probable in 2-3 wks
7.5 to 10	+++	+++	+++	0*	Death probable in 1-2.5 wks
10 to 20	+++	+++	+++	+++	Death certain in 5-12 days
> 20	+++	+++	+++	+++**	Death certain in 2-5 days

Abbreviations: Gy: dose in Grey;
0: no effects; +: mild; ++: moderate; +++: severe or marked

* Hypotension

** Also cardiovascular collapse, fever, shock

Modified from: Waselenko, JK, MacVittie, TJ, Blakely, WF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039.

Pearls

- Dealing with a patient with a radiation exposure can be a frightening experience. Do not ignore the ABC's, a dead but decontaminated patient is not a good outcome. Refer to the Decontamination Procedure for more information.
- Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Three methods of exposure:**
 - External irradiation
 - External contamination
 - Internal contamination
- **Two classes of radiation:**
 - Ionizing radiation (greater energy) is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays.
 - Non-ionizing (lower energy) examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem).
- Patients experiencing radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination.
- Typical ionizing radiation sources in the civilian setting include soil density probes used with roadway builders and medical uses such as x-ray sources as well as radiation therapy. Sources used in the production of nuclear energy and spent fuel are rarely exposure threats as is military sources used in weaponry. Nevertheless, these sources are generally highly radioactive and in the unlikely event they are the source, consequences could be significant and the patient's outcome could be grave.
- **The three primary methods of protection from radiation sources:**
 - Limiting time of exposure
 - Distance from
 - Shielding from the source
- Dirty bombs ingredients generally include previously used radioactive material and combined with a conventional explosive device to spread and distribute the contaminated material.
- Refer to Decontamination Procedure / WMD / Nerve Agent Protocol for dirty contamination events.
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes: Nausea/ Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.
- This event may require an activation of the National Radiation Injury Treatment Network, RITN. UNC Hospitals, Wake Forest-Baptist and Duke are the NC hospitals, with burns managed at UNC and Wake Forest.

General Medical EMS Triage and Destination Plan

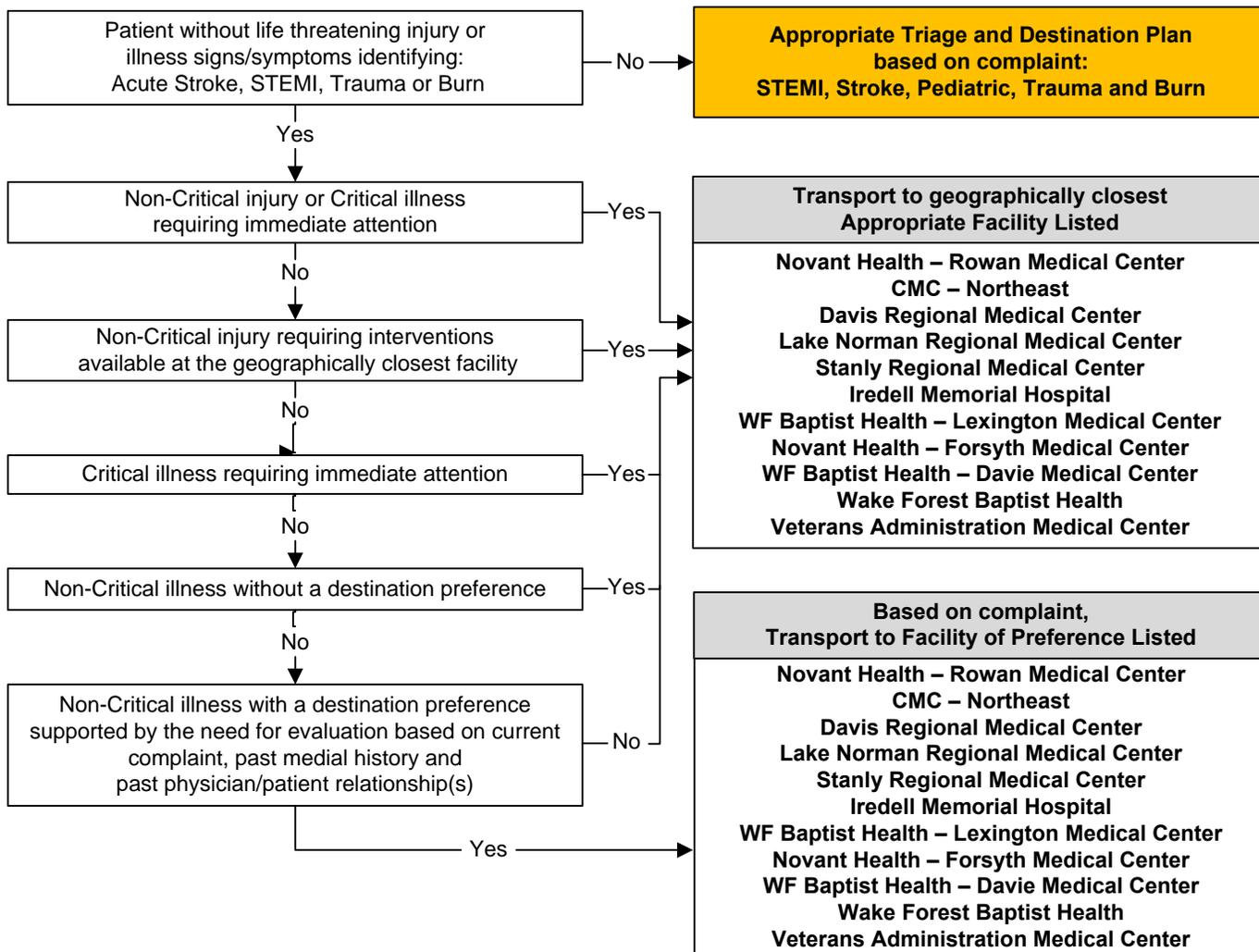


General Medical Patient

- ❖ A patient with signs and/or symptoms that cannot be categorized into STEMI, Stroke, Pediatric or Trauma and Burn Triage and Destination Plans.

The purpose of this plan is to:

- ❖ Identify general medical patients who call 911 or present to EMS
- ❖ Minimize field decision making on transport destinations
- ❖ Identify those patients that should be transported to the geographically closest facility based on complaint and facility capabilities
- ❖ Identify those patients that may be transported to a geographically distant facility based on complaint and facility capabilities
- ❖ Maximize EMS system resource utilization
- ❖ Provide quality EMS service and patient care to the EMS Systems citizens
- ❖ Continuously evaluate the EMS System based on North Carolinas EMS performance measures.



General Medical EMS Triage and Destination Plan

Pearls and Definitions

- ❖ **All General Medical patients should be triaged and transported using this plan. This plan is in effect 24/7/365**
- ❖ **Appropriate Facility** = a hospital which provides emergency care 24/7/365 that is determined, based on complaint, to be capable of addressing the primary patient condition.
- ❖ **Non-Critical Injury** = Injuries that may be considered time sensitive but not life threatening, i.e. fracture with loss of PMS
- ❖ **Critical Illness** = Any potentially life-threatening complaint that does not meet the criteria for STEMI, Stroke, Pediatric or Trauma and Burn Triage and Destination Plans.
- ❖ **Non-Critical Illness** = Any non life-threatening complaint (illness) that meets the guidelines for medical necessity of ambulance transport.
- ❖ Individual insurance plan requirements should not be a factor in determining the appropriate facility. Consideration of insurance plan requirements may be construed as treatment based on the ability to pay and such practices are prohibited.

Pediatric EMS Triage and Destination Plan

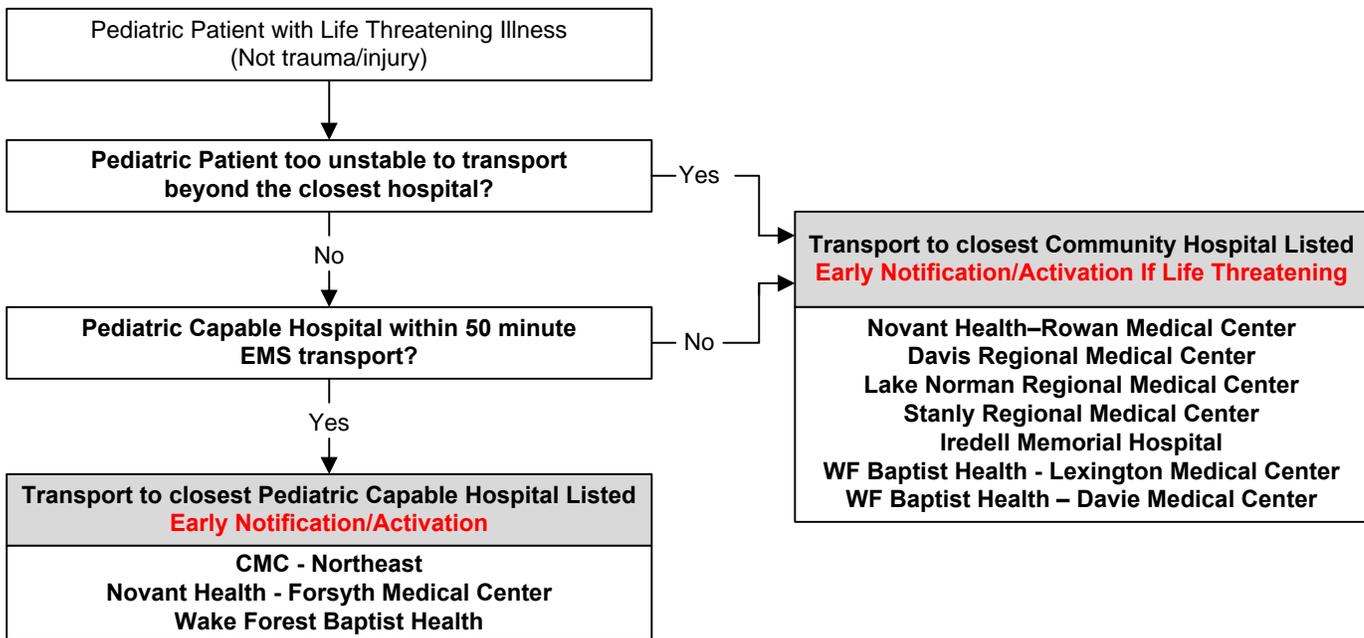


Pediatric Patient

- ❖ Any patient less than 16 years of age with a life-threatening illness (Not Trauma)
- Life Threatening Illness**
- ❖ Decreased mental Status (GCS<13)
- ❖ Non-responsive respiratory Distress
- ❖ Intubation
- ❖ Post Cardiac Arrest
- ❖ Non-responsive Hypotension (shock)
- ❖ Severe Hypothermia or Hyperthermia
- ❖ Status Epilepticus
- ❖ Potential Dangerous Envenomation
- ❖ Life Threatening Ingestion/Chemical Exposure
- ❖ Children with Special Healthcare Needs (and destination choice based on parental request)

The purpose of this plan is to:

- ❖ Rapidly identify acute Pediatric patients who call 911 or present to EMS with a life-threatening illness
- ❖ Minimize the time from EMS contact to definitive care
- ❖ Quickly diagnose patients with pediatric life-threatening illness for EMS treatment and stabilization
- ❖ Rapidly identify the best hospital destination based on symptom onset time, vital signs, response to treatment and predicted transport time
- ❖ Early activation/notification to the hospital prior to the patient arrival.
- ❖ Minimize scene time with a 'load and go' approach
- ❖ Provide quality EMS service and patient care to the EMS Community
- ❖ Continuously evaluate the EMS System based on North Carolinas EMS performance measures



Pediatric EMS Triage and Destination Plan

Pearls and Definitions

- ❖ **All Pediatric patients with a life threatening illness must be triaged and transported using this plan. This plan is in effect 24/7/365**
- ❖ **The Trauma and Burn Triage and Destination Plan should be used for all injured patients regardless of age**
- ❖ **All patient care is based on EMS Suspected Stroke Protocol**
- ❖ **Pediatric Capable Hospital** = a hospital which provides emergency and pediatric intensive care capability including but not limited to:
 - ❖ Emergency Department staffed 24 hours per day with board certified Emergency Physicians.
 - ❖ An inpatient Pediatric Intensive Care Unit (with a physician pediatric intensivist available in-house or on call 24/7/365)
 - ❖ Accepts all patients regardless of bed availability
 - ❖ Provides outcome and performance measure feedback to the EMS including case review
- ❖ **Community Hospital** = a local hospital within the EMS Systems service area which provides emergency care but does not meet the criteria of a Pediatric Capable Hospital
- ❖ **Pediatric Specialty Care Transport Program** = an air or ground based specialty care transport program that has specific pediatric training and equipment addressing the needs of a pediatric patient that can assume care of a pediatric patient from EMS or a Community hospital and transport to a Pediatric Capable Hospital.

Updated:
09/25/2014

Rowan County EMS System

This plan has been altered from the original NCEP Protocol by the local EMS Medical Director

2014

STEMI

EMS Triage and Destination Plan



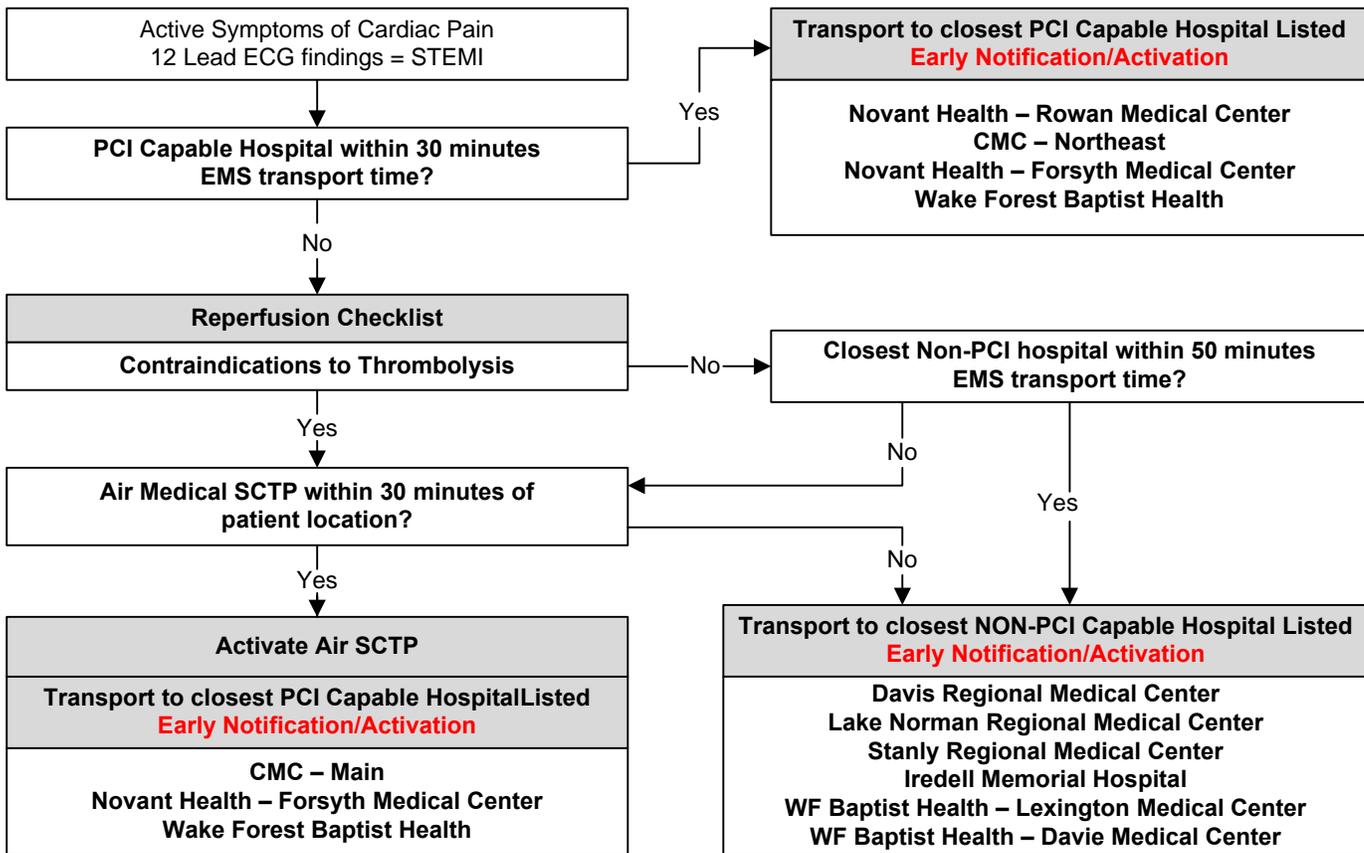
STEMI Patient

(ST Elevation Myocardial Infarction)

- ❖ Cardiac Symptoms greater than 15 minutes and less than 12 hours
- And**
- ❖ 12 lead ECG criteria of 1mm ST elevation in 2 or more contiguous leads.
- or**
- ❖ Left Bundle Branch Block
NOT KNOWN to be present in the past

The purpose of this plan is to:

- ❖ Rapidly identify STEMI patients who call 911 or present to EMS
- ❖ Minimize the time from onset of STEMI symptoms to coronary reperfusion
- ❖ Quickly diagnose a STEMI by 12 lead ECG
- ❖ Complete a reperfusion checklist (unless being transported directly to a PCI hospital) to determine thrombolytic eligibility
- ❖ Rapidly identify the best hospital destination based on a symptom onset time, reperfusion checklist and predicted transport time
- ❖ Early activation/notification to the hospital prior to the patient arrival
- ❖ Minimize scene time to 15 minutes or less (including a 12 lead ECG)
- ❖ Provide quality EMS service and patient care to the EMS Systems citizens.
- ❖ Continuously evaluate the EMS System based on North Carolinas EMS performance measures



STEMI EMS Triage and Destination Plan

Pearls and Definitions

- ❖ **All STEMI patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- ❖ **All patient care is based on EMS Chest Pain and STEMI Protocol**
- ❖ Consider implementing a prehospital thrombolytic program if a STEMI patient cannot reach a hospital within 90 minutes using air or ground EMS transport
- ❖ **PCI (Percutaneous Coronary Intervention) Capable Hospital** = a hospital with an emergency interventional cardiac catheterization laboratory capable of providing the following services to acute STEMI patients. Free standing emergency departments and satellite facilities are not considered part of the PCI hospital.
 - ❖ 24/7 PCI capability within 30 minutes of notification (interventional cardiologist present at the start of the case)
 - ❖ Single Call Activation number for use by EMS
 - ❖ Accepts all patients regardless of bed availability
 - ❖ Provides outcome and performance measure feedback to the EMS including case review
- ❖ **Non-PCI Hospital** = a local hospital within the EMS Systems service area which provides emergency care including thrombolytic administration to an Acute STEMI patient but does not provide PCI services
- ❖ **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute STEMI patient from EMS or a Non-PCI hospital and transport the patient to a PCI capable hospital

Updated:
09/25/2014

Rowan County EMS System

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2014

Stroke

EMS Triage and Destination Plan



Stroke Patient

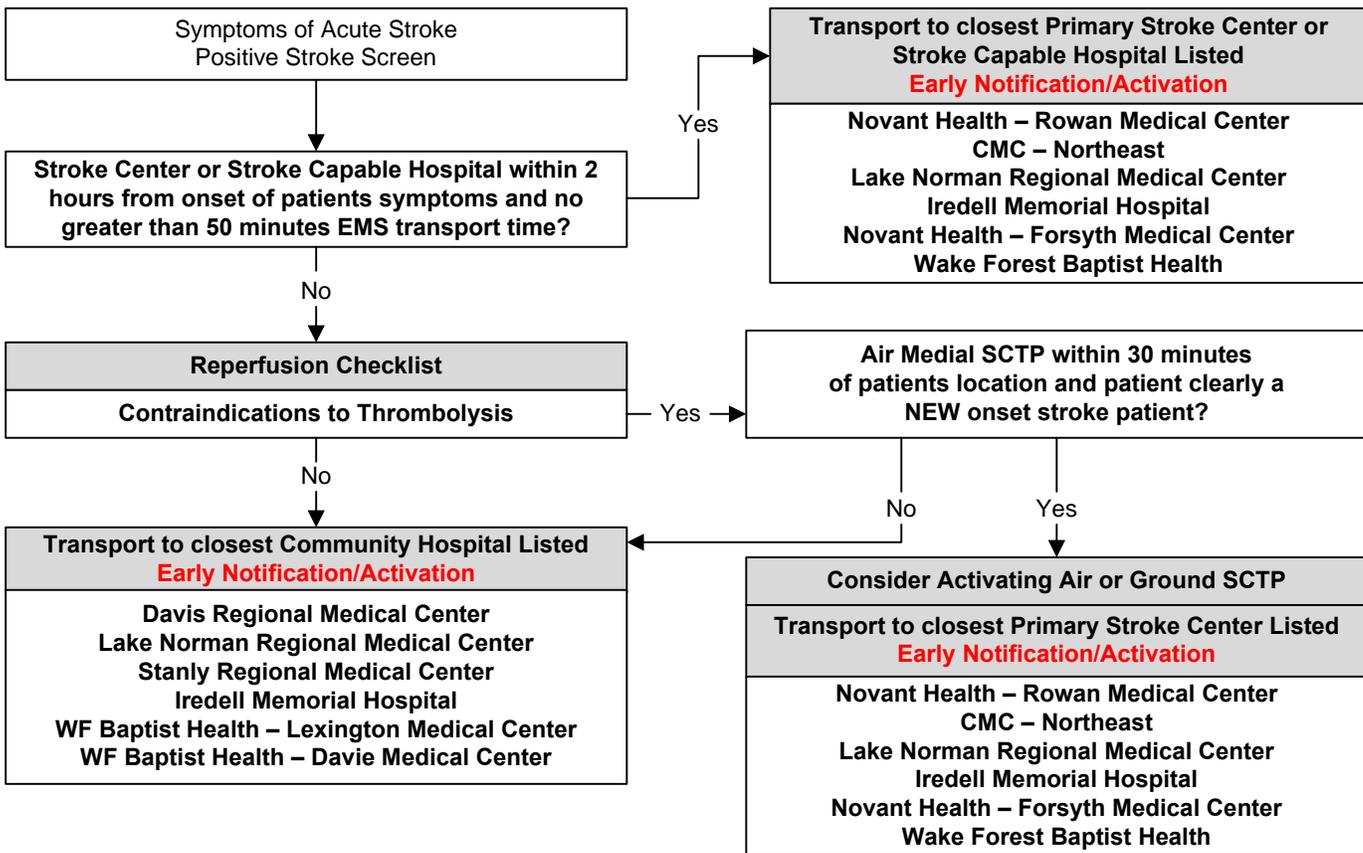
- ❖ A patient with symptoms of an acute stroke as identified by the EMS Stroke Screen

Time of Symptom Onset

- ❖ Defined as the last witnessed time the patient was symptom free (i.e. the time of onset for a patient awakening with stroke symptoms would be the last time he/she was known to be symptom free before the sleep period)

The purpose of this plan is to:

- ❖ Rapidly identify acute Stroke patients who call 911 or present to EMS
- ❖ Minimize the time from onset of Stroke symptoms to definitive care
- ❖ Quickly diagnose a Stroke using validated EMS Stroke Screen
- ❖ Complete a reperfusion checklist (unless being transported directly to a Stroke Capable Hospital) to determine thrombolytic eligibility
- ❖ Rapidly identify the best hospital destination based on symptom onset time, reperfusion checklist, and predicted transport time
- ❖ Early activation/notification to the hospital prior to the patient arrival
- ❖ Minimize scene time to 10 minutes or less
- ❖ Provide quality EMS service and patient care to the EMS Systems citizens
- ❖ Continuously evaluate the EMS System based on North Carolinas Stroke EMS performance measures.



Stroke EMS Triage and Destination Plan

Pearls and Definitions

- ❖ **All Stroke patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- ❖ All patient care is based on EMS Suspected Stroke Protocol
- ❖ **Primary Stroke Center** = a hospital that is currently accredited by the Joint Commission as a Primary Stroke Center. Free standing emergency departments and satellite facilities are not considered part of the Primary Stroke Center.
- ❖ **Stroke Capable Hospital** = a hospital which provides emergency care with a commitment to Stroke and the following capabilities:
 - ❖ CT availability with in-house technician availability 24/7/365
 - ❖ Ability to rapidly evaluate an acute stroke patient to identify patients who would benefit from thrombolytic administration
 - ❖ Ability and willingness to administer thrombolytic agents to eligible acute Stroke patients.
 - ❖ Accepts all patients regardless of bed availability
 - ❖ Provides outcome and performance measure feedback to the EMS including case review
- ❖ **Community Hospital** = a local hospital within the EMS Systems service area which provides emergency care but does not meet the criteria for a Primary Stroke Center or Stroke Capable Hospital
- ❖ **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute stroke patient from EMS or a hospital and transport the patient to a Primary Stroke Center.

Updated:
09/25/2014

Rowan County EMS System

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2014

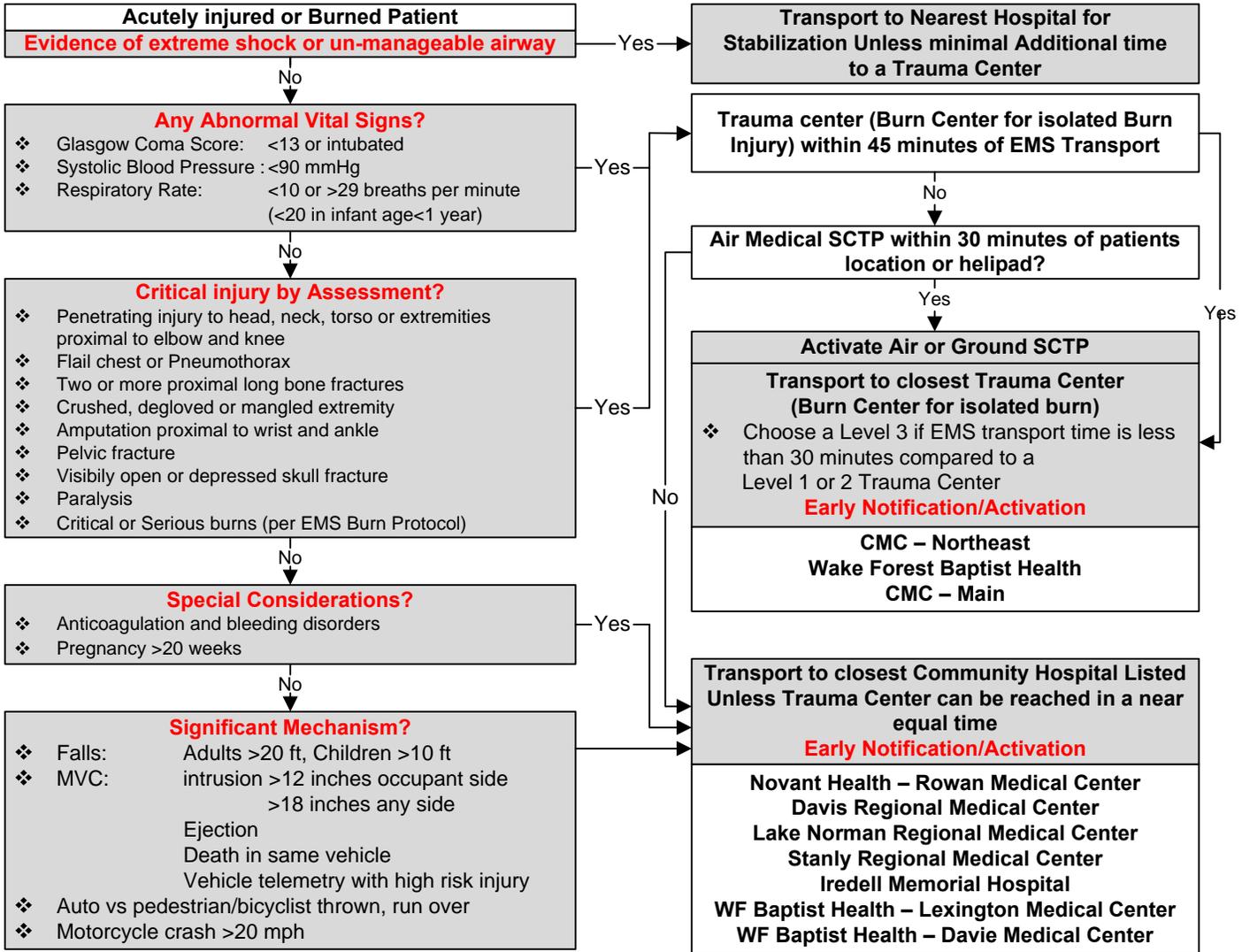
Trauma and Burn EMS Triage and Destination Plan



Trauma or Burn Patient = Any patient (regardless of age) with significant injury or burn

The purpose of this plan is to:

- ❖ Rapidly identify injured or burned patients who call 911 or present to EMS
- ❖ Minimize the time from injury to definitive care for critical injuries or burns
- ❖ Quickly identify life or limb threatening injuries for EMS treatment and stabilization
- ❖ Rapidly identify the best hospital destination based on time of injury and predicted transport time
- ❖ Early activation/notification to the hospital of a critically injured or burned patient prior to patient arrival
- ❖ Minimize scene time to 10 minutes or less from patient extrication with a 'load and go' approach
- ❖ Provide quality EMS service and patient care to the EMS Systems citizens.
- ❖ Continuously evaluate the EMS System based on North Carolinas EMS performance measures.



Trauma and Burn EMS Triage and Destination Plan

Pearls and Definitions

- ❖ **All Injury and Burn patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- ❖ **All patient care is based on EMS Trauma Protocols**
- ❖ **Designated Trauma Center** = a hospital that is currently designated as a Trauma Center by the North Carolina Office of Emergency Medical Services. Trauma Centers are designated as Level 1, 2, or 3 with Level 1 being the highest possible designation. Free standing emergency departments and satellite facilities are not considered part of the Trauma Center
- ❖ **Burn Center** = an ABA verified burn Center co-located with a designated Trauma Center
- ❖ **Community Hospital** = a local hospital within the EMS Systems service area which provides emergency care but has not been designated as a Trauma Center
- ❖ **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acutely injured patient from EMS or a Community Hospital and transport the patient to a Designated Trauma Center

Updated:
09/25/2014

Rowan County EMS System

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2014

Drug List

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Drug	Adult	Pediatric
<p><u>Acetaminophen</u> (Tylenol)</p> <p>NCCEP Protocol: * 7- Pain Control-Adult * 46-Pain Control-Pediatric * 72-Fever</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Indicated for pain and fever control Avoid in patients with severe liver disease 	<ul style="list-style-type: none"> 1000 mg po 	<ul style="list-style-type: none"> See Color Coded List 15 mg/kg po
<p><u>Adenosine</u> (Adenocard)</p> <p>NCCEP Protocol: * 16-Adult Tachycardia Narrow Complex * 17-Adult Tachycardia Wide Complex * 52-Pediatric Tachycardia</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Specifically for treatment or diagnosis of Supraventricular Tachycardia 	<ul style="list-style-type: none"> 6 mg IV push over 1-3 seconds. If no effect after 1-2 minutes, Repeat with 12 mg IV push over 1-3 seconds. Repeat once if necessary (use stopcock and 20 ml Normal Saline flush with each dose) 	<ul style="list-style-type: none"> 0.1 mg/kg IV (Max 6 mg) push over 1-3 seconds. If no effect after 1-2 minutes, Repeat with 0.2 mg/kg IV (Max 12 mg) push over 1-3 seconds. Repeat once if necessary (use stopcock and Normal Saline flush with each dose)
<p><u>Albuterol</u> Beta-Agonist</p> <p>NCCEP Protocol: * 24- Allergic Reaction Anaphylaxis * 26-COPD Asthma * 56-Pediatric Allergic Reaction * 61-Pediatric Respiratory Distress</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Beta-Agonist nebulized treatment for use in respiratory distress with bronchospasm 	<ul style="list-style-type: none"> 2.5-5.0 mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate \leq 150. 	<ul style="list-style-type: none"> See Color Coded List 2.5mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate < 200.

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Drug	Adult	Pediatric
<p><u>Amiodarone</u> (Cordarone)</p> <p>NCCEP Protocol:</p> <ul style="list-style-type: none"> * 17-Adult Tachycardia Wide Complex * 18-Adult Shockable * 52-Pediatric Tachycardia * 53-Pediatric Shockable * 54-Pediatric Post Resuscitation <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> • Antiarrhythmic used mainly in wide complex tachycardia and ventricular fibrillation. • Avoid in patients with heart block or profound bradycardia. • Contraindicated in patients with iodine hypersensitivity 	<p style="text-align: center;"><u>V-fib / pulseless V-tach</u></p> <ul style="list-style-type: none"> • 300 mg IV push • Repeat dose of 150 mg IV push for recurrent episodes <p style="text-align: center;"><u>V-tach with a pulse</u></p> <ul style="list-style-type: none"> • 150 mg in 100cc D5W over 10 min 	<p style="text-align: center;"><u>V-fib / pulseless V-tach</u></p> <ul style="list-style-type: none"> • 5 mg/kg IV push over 5 minutes • May repeat up to 15 mg/kg IV <p style="text-align: center;"><u>V-tach with a pulse</u></p> <ul style="list-style-type: none"> • 5 mg/kg IV push over 5 minutes • May repeat up to 15 mg/kg IV • Avoid in Length Tape Color Pink
<p><u>Aspirin</u></p> <p>NCCEP Protocol:</p> <ul style="list-style-type: none"> * 7-Pain Control Adult * 14-Chest Pain and STEMI <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> • An antiplatelet drug for use in cardiac chest pain 	<ul style="list-style-type: none"> • 81 mg chewable (baby) Aspirin Give 4 tablets to equal usual adult dose. 	
<p><u>Atropine</u></p> <p>NCCEP Protocol:</p> <ul style="list-style-type: none"> * 12-Bradycardia Pulse Present * 49-Pediatric Bradycardia * 84-WMD Nerve Agent <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> • Anticholinergic drug used in bradycardias. • In Organophosphate toxicity, large doses may be required (>10 mg) 	<p style="text-align: center;"><u>Bradycardia</u></p> <ul style="list-style-type: none"> • 0.5 - 1.0 mg IV every 3 – 5 minutes up to 3 mg. <p style="text-align: center;"><u>Organophosphate</u></p> <ul style="list-style-type: none"> • 1-2 mg IM or IV otherwise as per medical control 	<ul style="list-style-type: none"> • See Color Coded List <p style="text-align: center;"><u>Bradycardia</u></p> <ul style="list-style-type: none"> • 0.02 mg/kg IV, IO (Max 0.5 mg per dose, max total dose 1 mg IV) • (Min 0.1 mg) per dose • May repeat in 3 - 5 minutes <p style="text-align: center;"><u>Organophosphate</u></p> <ul style="list-style-type: none"> • 0.02 mg/kg IV or IO otherwise as per medical control

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Drug	Adult	Pediatric
<p><u>Atropine and Pralidoxime Auto-Injector Nerve Agent Kit</u></p> <p>NCCEP Protocol: * 84-WMD Nerve Agent</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Antidote for Nerve Agents or Organophosphate Overdose 	<ul style="list-style-type: none"> • One auto-injector then per medical control 	<ul style="list-style-type: none"> • See Color Coded List • One pediatric auto-injector then as per medical control
<p><u>Calcium Chloride</u></p> <p>NCCEP Protocol: * 28-Dialysis Renal Failure * 31-Overdose Toxic Ingestion * 60-Ped OD Toxic Ingestion * 83-Marine Envenomations * 88-Crush Syndrome</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Indicated for severe hyperkalemia 	<ul style="list-style-type: none"> • 1 gm IV/IO • Avoid use if pt is taking digoxin 	<ul style="list-style-type: none"> • See Color Coded List • 20 mg/kg IV or IO slowly
<p><u>Dextrose 10%, 25%, 50%</u> Glucose solutions</p> <p>NCCEP Protocol: * Multiple</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Use in unconscious or hypoglycemic states 	<p>See protocol for concentration and dosing</p>	<ul style="list-style-type: none"> • See Color Coded List <p>See protocol for concentration and dosing</p>

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Drug	Adult	Pediatric
<p><u>Diazepam</u> (Valium) Benzodiazepene</p> <p>NCCEP Protocol: * 32-Seizure * 39-Obstetrical Emergency * 62-Pediatric Seizure</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Seizure control Mild Sedation 	<ul style="list-style-type: none"> 4 mg IV initially then 2 mg IV every 3 - 5 minutes up to 10 mg max unless med control dictates Do not administer IM. The drug is not absorbed. 10 mg Rectally if unable to obtain an IV. 	<ul style="list-style-type: none"> See Color Coded List 0.1 - 0.3 mg/kg IV/IO (Max dose 4 mg IV, IO) 0.5 mg/kg rectally (Dia-Stat) (Max dose 10 mg rectally) Repeat as directed by medical control.
<p><u>Dilaudid</u> (Hydromorphone) Narcotic Analgesic</p> <p>NCCEP Protocol: * 7-Pain Control Adult * 46-Pain Control Pediatric</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Narcotic pain relief Antianxiety Possible beneficial effect in pulmonary edema Avoid use if BP < 110 	<ul style="list-style-type: none"> 1-2 mg IM/IV/IO bolus then 1 mg IM/IV/IO every 20-30 minutes until a maximum of 5 mg or clinical improvement 	<ul style="list-style-type: none"> See Color Coded List 0.015 mg/kg IM/IV/IO single bolus only (Max 2 mg) Minimum Age = 5 years or 20 kg)
<p><u>Diltiazem</u> (Cardizem) Calcium Channel Blocker</p> <p>NCCEP Protocol: * 16-Adult Tachycardia Narrow Complex</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Calcium channel blocker used to treat narrow complex SVT Contraindicated in patients with heart block, ventricular tachycardia, an/or acute MI 	<ul style="list-style-type: none"> 0.25 mg/kg IV over 2 minutes 	

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Drug	Adult	Pediatric
<p><u>Diphenhydramine (Benadryl)</u></p> <p>NCCEP Protocol: * 24-Allergic Reaction Anaphylaxis * 56-Pediatric Allergic Reaction</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Antihistamine for control of allergic reactions 	<ul style="list-style-type: none"> 25-50 mg IV/IO/IM/PO 	<ul style="list-style-type: none"> See Color Coded List 1 mg/kg IV/IO/IM Do not give in infants < 3 mo
<p><u>Dopamine</u></p> <p>NCCEP Protocol: * Multiple</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> A vasopressor used in shock or hypotensive states 	<ul style="list-style-type: none"> 2 - 20 micrograms/kg/min IV/IO titrate to BP systolic of 90 mmHg 	<ul style="list-style-type: none"> See Color Coded List 2 - 20 micrograms/kg/min IV or IO, titrate to BP systolic appropriate for age
<p><u>Epinephrine 1:1,000</u></p> <p>NCCEP Protocol: * Multiple</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Vasopressor used in allergic reactions or anaphylaxis 	<ul style="list-style-type: none"> 0.3 mg IM (if age < 50 yrs) 0.15 mg IM (if age > 50 yrs) <p>Nebulized Epinephrine</p> <ul style="list-style-type: none"> 1 mg mixed with 2 ml of Normal Saline 	<ul style="list-style-type: none"> See Color Coded List 0.01 mg/kg IM (Max dose 0.3 mg) <p>Nebulized Epinephrine</p> <ul style="list-style-type: none"> 1 mg mixed with 2 ml of Normal Saline
<p><u>Epinephrine 1:10,000</u></p> <p>NCCEP Protocol: * Multiple</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Vasopressor used in cardiac arrest. 	<ul style="list-style-type: none"> 1.0 mg IV/IO Repeat every 3 - 5 minutes until observe response 	<ul style="list-style-type: none"> See Color Coded List 0.01 mg/kg IV or IO (Max dose 1 mg) Repeat every 3 - 5 minutes until observe response

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Drug	Adult	Pediatric
<p><u>Etomidate</u> (Amidate)</p> <p>NCCEP Protocol: * 4-Airway Rapid Sequence Intubation * 20-Induced Hypothermia</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Hypnotic sedative used in Drug Assisted Intubation 	<ul style="list-style-type: none"> 0.3 mg/kg IV/IO Usual adult dose = 20 mg 	
<p><u>Famotidine</u> (Pepcid) Histamine-2 Blocker</p> <p>NCCEP Protocol: * 24-Adult Allergic Reaction * 56-Pediatric Allergic Reaction</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Medication used to control stomach acid and to assist in severe allergic reactions 	<ul style="list-style-type: none"> 20 mg IV 20-40 mg PO 	<ul style="list-style-type: none"> 0.5 mg/kg IV / PO Maximum 10mg
<p><u>Furosemide</u> (Lasix)</p> <p>NCCEP Protocol: * 15-CHF Pulmonary Edema * 50-Pediatric CHF Pulmonary Edema</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Diuretic for pulmonary edema or CHF but no proven benefit in prehospital care 	<ul style="list-style-type: none"> 20 mg IV or dose to equal patient's normal single home PO dose (Maximum dose = 160 mg) 	<ul style="list-style-type: none"> Requires Medical Control Order 1 mg/kg IV

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Drug	Adult	Pediatric
<p><u>Glucagon</u></p> <p>NCCEP Protocol: * 27-Diabetic; Adult * 31-Overdose Toxic Ingestion * 58-Pediatric Diabetic * 60-Ped OD Toxic Ingestion</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Drug acting to release glucose into blood stream by glycogen breakdown • Use in patients with no IV access 	<ul style="list-style-type: none"> • 1 - 2 mg IM • Repeat blood glucose measurement in 15 minutes, if \leq 69 mg/dl repeat dose. 	<ul style="list-style-type: none"> • See Color Coded List • 0.1 mg/kg IM • Repeat blood glucose measurement in 15 minutes, if \leq 69 mg/dl repeat dose.
<p><u>Glucose Oral</u> <u>Glucose Solutions</u></p> <p>NCCEP Protocol: * 27-Diabetic; Adult * 58-Pediatric Diabetic</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Use in conscious hypoglycemic states 	<ul style="list-style-type: none"> • One tube or packet • Repeat based on blood glucose results 	<ul style="list-style-type: none"> • See Color Coded List • One Tube or packet • Repeat based on blood glucose result • Consider patient's ability to swallow and follow directions based on age
<p><u>Haloperidol</u> (Haldol) Phenothiazine Preparation</p> <p>NCCEP Protocol: * 6-Behavioral</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Medication to assist with sedation of agitated patients 	<ul style="list-style-type: none"> • 2.5-10 mg IM • May repeat as per Medical Control 	

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Drug	Adult	Pediatric
<p><u>Ibuprofen</u> (Motrin) Non-steroidal Anti-inflammatory Drug</p> <p>NCCEP Protocol: * 72-Fever * 7-Pain Control Adult * 46-Pain Control Pediatric</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Avoid NSAIDS in women who are pregnant or could be pregnant. • A nonsteroidal anti-inflammatory drug (NSAID) used for pain and fever control. • Not to be used in patients with history of GI Bleeding (ulcers) or renal insufficiency. • Not to be used in patients with allergies to aspirin or other NSAID drugs • Avoid in patients currently taking anticoagulants, such as coumadin. 	<ul style="list-style-type: none"> • 400-800 mg po 	<ul style="list-style-type: none"> • See Color Coded List • 10 mg/kg po • Do not use in patients 6 months of age or younger
<p><u>Ipratropium</u> (Atrovent)</p> <p>NCCEP Protocol: * 24-Allergic Reaction Anaphylaxis * 26-COPD Asthma * 56-Pediatric Allergic Reaction * 61-Pediatric Respiratory Distress</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Medication used in addition to albuterol to assist in patients with asthma and COPD 	<ul style="list-style-type: none"> • 2 puffs per dose of MDI (18 mcg/spray) --- OR --- • 500 mcg (0.5mg) per nebulizer treatment 	<ul style="list-style-type: none"> • Use in Pediatrics as a combined Therapy with a Beta Agonist such as Albuterol • 2 puffs per dose of MDI (18 mcg/spray) --- OR --- • 500 mcg (0.5mg) per nebulizer treatment

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Drug	Adult	Pediatric
<p><u>Ketamine</u></p> <p>NCCEP Protocol: * 3-Airway Drug Assisted Intubation * 20-Induced Hypothermia</p> <p>Indications/Contraindications: • Hypnotic used in Drug Assisted Intubation</p>	<ul style="list-style-type: none"> • 1-2 mg/kg IV 	
<p><u>Ketorolac (Toradol)</u> Non-steroidal Anti-inflammatory Drug</p> <p>NCCEP Protocol: * 7-Pain Control Adult * 46-Pediatric Pain Control</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> • Avoid NSAIDS in women who are pregnant or could be pregnant • A nonsteroidal anti-inflammatory drug used for pain control. • Not to be used in patients with history of GI bleeding (ulcers), renal insufficiency, or in patients who may need immediate surgical intervention (i.e. obvious fractures). • Not to be used in patients with allergies to aspirin or other NSAID drugs such as motrin • Avoid in patients currently taking anticoagulants such as coumadin 	<ul style="list-style-type: none"> • 30 mg IV / IO or 60 mg IM 	<ul style="list-style-type: none"> • 0.5 mg/kg IV / IO / IM – Maximum 30 mg

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Drug	Adult	Pediatric
<p><u>Levalbuterol</u> (Xopenex) Beta-Agonist</p> <p>NCCEP Protocol: * 30-Respiratory Distress * 46-Pediatric Respiratory Distress * 52-Drowning</p> <p>Indications/Contraindications: • Beta-Agonist nebulized treatment for use in respiratory distress with bronchospasm</p>	<ul style="list-style-type: none"> • 0.63-1.25 mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate \leq 150. 	<ul style="list-style-type: none"> • See Color Coded List • 0.31-0.63 mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate < 200.
<p><u>Lidocaine</u></p> <p>NCCEP Protocol: * 4-Airway Rapid Sequence Intubation * 18-Shockable Rhythm * 53-Pediatric Shockable Rhythm</p> <p>Indications/Contraindications: • Antiarrhythmic used for control of ventricular dysrhythmias • Anesthetic used during intubation to prevent elevated intracranial pressures during intubation</p>	<ul style="list-style-type: none"> • 1.5 mg/kg IV / IO bolus up to 3mg/kg max bolus dose • Initial Dose 0.75 mg/kg in patients \geq 60 years of age. • Repeat 1/2 initial dose in 10 minutes. • No Drip Administration 	<ul style="list-style-type: none"> • See Color Coded List • 1 mg/kg IV, IO bolus – Maximum 100mg per bolus • Repeat 1/2 initial bolus in 10 minutes – Maximum 3mg/kg total • No Drip Administration
<p><u>Lorazepam</u> (Ativan) Benzodiazepene</p> <p>NCCEP Protocol: * Multiple protocols</p> <p>Indications/Contraindications: Benzodiazepine used to control seizures and sedation</p>	<p>2-4 mg IV/IM May repeat q 5-10 minutes if seizures not controlled</p>	<ul style="list-style-type: none"> • See Color Coded List • 0.05-0.1 mg/kg IV/IM (max 2 mg/dose) • May repeat q 5-10 minutes (Maximum of 3 doses) if seizures not controlled

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<p><u>Magnesium Sulfate</u></p> <p>NCCEP Protocol: * Multiple</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Elemental electrolyte used to treat eclampsia during the third trimester of pregnancy. A smooth muscle relaxor used in refractory respiratory distress resistant to beta-agonists 	<ul style="list-style-type: none"> 2 g slow IV / IO – over 10 minutes dose may be repeated once <p>Obstetrical Seizure:</p> <ul style="list-style-type: none"> 2 g IV / IO over 2-3 minutes Dose may be repeated once 	<ul style="list-style-type: none"> 40 mg/kg slow IV over 20 minutes (Max 2 gms) dose may be repeated once
<p><u>Methylprednisolone (Solu-medrol) Steroid Preparation</u></p> <p>NCCEP Protocol: * 24-Allergic Reaction Anaphylaxis * 26-COPD Asthma * 56-Pediatric Allergic Reaction * 61-Pediatric Respiratory Distress</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Steroid used in respiratory distress to reverse inflammatory and allergic reactions 	<ul style="list-style-type: none"> 125 mg IV May be given IM if necessary 	<ul style="list-style-type: none"> See Color Coded List 2 mg/kg IV / IO (Max 125 mg) IM if necessary
<p><u>Midazolam (Versed) Benzodiazepine</u></p> <p>NCCEP Protocol: * Multiple protocols</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Benzodiazepine used to control seizures and sedation Quick acting Benzodiazepine Preferred over Valium for IM use Use with caution if BP < 110 	<ul style="list-style-type: none"> 0.5-2 mg IV slowly over 2-3 minutes. May slowly titrate dose up to 5 mg total if needed. Usual total dose: 2.5-5 mg 1-2 mg Nasally via Atomizer. Usual total dose: 2-5 mg IM dosage: 5 mg 	<ul style="list-style-type: none"> See Color Coded List 0.1-0.2 mg/kg IV or IO slowly over 2 – 3 minutes (Max 2 mg)

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<p><u>Morphine Sulfate</u> Narcotic Analgesic</p> <p>NCCEP Protocol: * Multiple</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Narcotic pain relief Antianxiety Possible beneficial effect in pulmonary edema Avoid use if BP < 110 	<ul style="list-style-type: none"> 4 mg IM/IV/IO bolus then 2 mg IM/IV/IO every 5-10 minutes until a maximum of 10 mg or clinical improvement 	<ul style="list-style-type: none"> See Color Coded List 0.1 mg/kg IV or IO single bolus only (Max 5 mg) May repeat every 5 minutes Maximum single dose 5 mg Maximum dose 10 mg
<p><u>Naloxone</u> (Narcan) Narcotic Antagonist</p> <p>NCCEP Protocol: * 31-Overdose Toxic Ingestion * 60- Ped OD Toxic Ingestion</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> Narcotic antagonist 	<ul style="list-style-type: none"> 0.5 - 2 mg IV bolus titrated to patient's respiratory response May be given IM or IN if unable to establish IV in a known narcotic overdose 	<ul style="list-style-type: none"> See Color Coded List 0.1 mg/kg IV / IN or IO (Max 2 mg) May repeat in 5 minutes if no effect.
<p><u>Normal Saline</u> Crystalloid Solutions</p> <p>NCCEP Protocol: * Multiple</p> <p>Indications/Contraindications:</p> <ul style="list-style-type: none"> The IV fluid of choice for access or volume infusion 	<ul style="list-style-type: none"> KVO for IV access Bolus in 250-500 ml for cardiac Bolus in 500 to 1000 ml amount for volume Bolus in 1000 ml amount for burns or electrical injuries. See Burn Protocol or Reference Materials for IV rates. 	<ul style="list-style-type: none"> See Color Coded List KVO for IV or IO access Bolus in 20ml/kg for volume (May be repeated x 3) See Burn Protocol or Reference Materials for IV rates.

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<p><u>Nitroglycerin</u></p> <p>NCCEP Protocol: * 14-Chest Pain and STEMI * 15-CHF Pulmonary Edema</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Vasodilator used in anginal syndromes, CHF and Hypertension. 	<p><u>Chest Pain</u></p> <ul style="list-style-type: none"> 1 spray/tablet SL every 5 minutes until painfree or 3 doses If SBP < 100, contact medical control 1" paste after pain free or 3 doses <p><u>Pulmonary Edema</u></p> <ul style="list-style-type: none"> 1 spray/tablet SL every 1-2 minutes if BP >110 Systolic Mean Arterial Blood Pressure should not be decreased more than 30% <p><u>Hypertension</u></p> <ul style="list-style-type: none"> 1 spray/tablet SL every 1-2 minutes until BP <110 Diastolic Mean Arterial Blood Pressure should not be decreased more than 30% 	
<p><u>Ondansetron</u> (Zofran) Anti-emetic</p> <p>NCCEP Protocol: * 15-Abdominal Pain * 21-Chest Pain and STEMI * 37-Vomiting and Diarrhea</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Anti-Emetic used to control Nausea and/or Vomiting Ondansetron (Zofrin) is the recommended Anti-emetic for EMS use since it is associated with significantly less side effects and sedation. 	<ul style="list-style-type: none"> 4 mg IV / IO / IM / PO / ODT 	<ul style="list-style-type: none"> 0.15 mg/kg IV / IO / IM (Max 4 mg) 0.2 mg/kg PO / ODT (Max 4 mg)

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<p><u>Oxygen</u></p> <p>NCCEP Protocol: * Multiple</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Useful in any condition with cardiac work load, respiratory distress, or illness or injury resulting in altered ventilation and/or perfusion. Required for pre-oxygenation whenever possible prior to intubation. 	<ul style="list-style-type: none"> 1-4 liters/min via nasal cannula 6-15 liters/min via NRB mask 15 liters via BVM 	<ul style="list-style-type: none"> 1-4 liters/min via nasal cannula 6-15 liters/min via NRB mask 15 liters via BVM

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<p><u>Oxymetazoline</u> (Afrin or Otrivin) Nasal Decongestant Spray</p> <p>NCCEP Protocol: * 71-Epistaxis</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Vasoconstrictor used with nasal intubation and epistaxis Relative Contraindication is significant hypertension 	<ul style="list-style-type: none"> 2 sprays in affected nostril 	<ul style="list-style-type: none"> See Color Coded List 1-2 sprays in affected nostril
<p><u>Rocuronium</u></p> <p>NCCEP Protocol: * 4-Airway Rapid Sequence Intubation * 19-Post Resuscitation * 20-Induced Hypothermia</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> Non-depolarizing paralytic agent used as a component of drug assisted intubation (Rapid Sequence Intubation), when succinylcholine is contraindicated. Onset of action is longer than succinylcholine, up to 3 minutes, patient will NOT defasciculate. 	<ul style="list-style-type: none"> 1 mg/kg IV / IO May repeat per protocol 	
<p><u>Sodium Bicarbonate</u></p> <p>NCCEP Protocol: * 28-Dialysis Renal Failure * 31-Overdose Toxic Ingestion * 60-Ped OD Toxic Ingestion * 88-Crush Syndrome</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> A buffer used in acidosis to increase the pH in Cardiac Arrest or Tricyclic Overdose. 	<ul style="list-style-type: none"> 50 mEq IV / IO initially, then 25 mEq IV / IO every 10 minutes as needed In TCA (tricyclic), 50 mEq bolus, then 100 mEq in 1 liter of NS for infusion at 200 ml/hr 	<ul style="list-style-type: none"> See Color Coded List 1 meq/kg IV, IO initially, then 1/2 meq/kg IV every 10 minutes as needed. TCA (tricyclic) overdose per medical control.

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Drug	Adult	Pediatric
<p><u>Succinylcholine</u> Paralytic Agent</p> <p>NCCEP Protocol: * 4-Airway Rapid Sequence Intubation</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Paralytic Agent used as a component of Drug Assisted Intubation (Rapid Sequence Intubation) • Avoid in patients with burns >24 hours old, chronic neuromuscular disease (e.g., muscular dystrophy), ESRD, or other situation in which hyperkalemia is likely. 	<ul style="list-style-type: none"> • 1.5 mg/kg IV / IO 	
<p><u>Vasopressin</u> (Pitressin)</p> <p>NCCEP Protocol: * 11-Asystole * 18-Shockable Rhythm Adult</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Medication used in place of and/or in addition to epinephrine in the setting of ventricular fibrillation/pulsesless ventricular tachycardia 	<ul style="list-style-type: none"> • 40 units IV / IO X 1 as the first or second dose of a vasopressor 	

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Drug	Adult	Pediatric
<p><u>Vecuronium</u> Paralytic Agent</p> <p>NCCEP Protocol: * 4-Airway Rapid Sequence Intubation * 19-Post Resuscitation * 20-Induced Hypothermia</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Long-acting non-depolarizing paralytic agent • Avoid in patients with chronic neuromuscular disease (e.g., muscular dystrophy). 	<ul style="list-style-type: none"> • 0.1 mg/kg IV / IO 	
<p><u>Zemuron</u> (Rocuronium) Paralytic Agent</p> <p>NCCEP Protocol: * 4-Airway Rapid Sequence Intubation * 19-Post Resuscitation * 20-Induced Hypothermia</p> <p><u>Indications/Contraindications:</u></p> <ul style="list-style-type: none"> • Paralytic • Avoid in patients with chronic neuromuscular disease (e.g., muscular dystrophy). 	<ul style="list-style-type: none"> • 0.6 mg/kg IV / IO • Recommended adult dose for prehospital intubation = 10mg 	
<p><u>Antibiotics</u></p> <p>Indications:</p> <ul style="list-style-type: none"> • Treat or prevent infections <p>Pearls:</p> <ul style="list-style-type: none"> • Report any adverse reaction, i.e. urticaria, nausea/vomiting to Medical Control 	<p>Adult:</p> <ul style="list-style-type: none"> • Varies depending on med • Follow existing orders or label instructions 	<ul style="list-style-type: none"> • Varies depending on med • Follow exist orders or label instructions

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<p><u>Heparin Drip</u></p> <p>Indications:</p> <ul style="list-style-type: none"> • Anticoagulation therapy <p>Pearls:</p> <ul style="list-style-type: none"> • Observe for bleeding 	<ul style="list-style-type: none"> • Follow existing orders or label instructions 	<ul style="list-style-type: none"> • N/A
<p><u>Magnesium Sulfate Drip</u></p> <p>Indications:</p> <ul style="list-style-type: none"> • Hypomagnesium, Torsades de points, Preeclampsia, Eclampsia <p>Pearls:</p> <ul style="list-style-type: none"> • Dissappearance of knee jerk/patellar reflex indicates toxic level • May cause respiratory depression, hypotension, heart block 	<ul style="list-style-type: none"> • Follow existing orders or label instructions 	<ul style="list-style-type: none"> • N/A
<p><u>Nitroglycerin Drip</u></p> <p>Indications:</p> <ul style="list-style-type: none"> • Chest Pain, CHF, Pulmonary Edema <p>Pearls:</p> <ul style="list-style-type: none"> • May cause hypotension, headache, flushing • Frequent vital signs are indicated 	<ul style="list-style-type: none"> • Follow existing orders or label instructions • May increase infusion rate by 5-20 mcg/min until: <ul style="list-style-type: none"> - Systolic BP falls below 100mmHG - Heart Rate increases 20 BPM - Chest Pain is relieved 	<ul style="list-style-type: none"> • N/A

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<p><u>Platelet Glycoprotein IIb / IIIa Inhibitors</u></p> <p>Indications:</p> <ul style="list-style-type: none"> Inhibits platelet aggregation in acute coronary syndrome including PCI <p>Pearls:</p> <ul style="list-style-type: none"> Contraindicated: Hypersensitivity, recent surgery, bleeding or bleeding disorders, recent CVA, uncontrolled severe hypertension, hypotension and renal dialysis dependency SE: Bleeding, CVA, thrombocytopenia, bradycardia and rash 	<ul style="list-style-type: none"> Variable depending on med, follow existing orders or label instructions 	<ul style="list-style-type: none"> N/A
<p><u>Potassium Chloride</u></p> <p>Indications:</p> <ul style="list-style-type: none"> Hypokalemaia <p>Pearls:</p> <ul style="list-style-type: none"> Cardiac monitor indicated for rates above 10mEq/hr May cause arrhythmias, nausea, vomiting, phlebitis at IV site 	<ul style="list-style-type: none"> Follow existing orders or label instructions 	<ul style="list-style-type: none"> Follow existing orders or label instructions
<p><u>Thrombolytics (i.e. Urokinase, Streptokinase, TPA)</u></p> <p>Indications:</p> <ul style="list-style-type: none"> To dissolve thrombi <p>Pearls:</p> <ul style="list-style-type: none"> IM injections, venipuncture contraindicated during therapy Many possible side effects depending on medication. Most common include bleeding, fever, urticaria, hypotension, arrhythmias 	<ul style="list-style-type: none"> Varies depending on medication Follow existing orders or label instructions 	<ul style="list-style-type: none"> Varies depending on medication Follow existing orders or label instructions

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Drug	Adult	Pediatric
<p><u>Whole Blood and Components</u></p> <p>Indications:</p> <ul style="list-style-type: none"> Restore circulating volume, replace clotting factors, improve oxygen carrying capacity of blood <p>Pearls:</p> <ul style="list-style-type: none"> Discontinue infusion immediately if any of the following occur: fever with or without chills, chest pain, pain at infusion site, lower back pain, hypotension, nausea, flushing, dyspnea, bleeding, blood in urine, shock, absent or decreased urine output. Notify both sending and receiving facilities 	<ul style="list-style-type: none"> All products should be infused within four hours, whole blood may be as fast as patient can tolerate. Fresh frozen plasma/platelets usually 10 ml/min 	<ul style="list-style-type: none"> All products should be infused within four hours, whole blood may be as fast as patient can tolerate. Fresh frozen plasma/platelets usually 10ml/min.



Pediatric Color Coded Drug List



Length < 59.5 cm		Weight 3-5 Kg (Avg 4.0 Kg)		Gray (0-3 months)	
Vital Signs		Acetaminophen	64 mg	Epinephrine 1:10,000	0.04 mg
Heart Rate	120-150	Adenosine 1 st Dose-	0.3 mg	Epinephrine 1:1000 Nebulized	2.0 mg
Respirations	24-48	Repeat Dose-	0.6 mg	Epinephrine 1:1000 IM	0.05 mg
BP Systolic	70 (+/-25)	Afrin Nasal Spray	HOLD	Fentanyl	8.0 mcg
Equipment		Albuterol	2.5mg	Glucagon	0.5 mg
ET Tube	2.5 - 3.5	Amiodarone	20 mg	Ibuprofen	N/A
Blade Size	0 - 1	Atropine	0.10 mg	Ipratropium	500 mcg
Defibrillation		Calcium Chloride	80 mg	Levalbuterol	0.31 mg
Defibrillation	8 J, 15 J	Charcoal	N/A	Lidocaine	4 mg
Cardioversion	2 J, 4 J	Dextrose 10%	20 ml	Lorazepam	0.2 mg
Normal Saline		Diazepam (IV)	0.8 mg	Magnesium Sulfate	200 mg
80 ml		(Rectal)	2.0 mg	Methylprednisolone	6.25 mg
		Dilaudid	HOLD	Midazolam	0.5 mg
		Diphenhydramine	6.5 mg	Morphine Sulfate	0.4 mg
		Dopamine (800 mg in 500 cc)		Naloxone	0.4 mg
		2 mcg/kg/min	0.3 ml/hr	Ondansetron	0.6 mg
		5 mcg/kg/min	0.9 ml/hr	Prednisone	4.0 mg
		10 mcg/kg/min	1.7 ml/hr	Sodium Bicarbonate	4 mEq
		20 mcg/kg/min	3.3 ml/hr		

Length 59.5-66.5 cm		Weight 6-7 Kg (Avg 6.5 Kg)		Pink (3-6 Months)	
Vital Signs		Acetaminophen	96 mg	Epinephrine 1:10,000	0.06 mg
Heart Rate	120-125	Adenosine 1 st Dose-	0.6 mg	Epinephrine 1:1000 Nebulized	2.0 mg
Respirations	24-48	Repeat Dose-	1.2 mg	Epinephrine 1:1000 IM	0.06 mg
BP Systolic	85 (+/-25)	Afrin Nasal Spray	HOLD	Fentanyl	13.0 mcg
Equipment		Albuterol	2.5 mg	Glucagon	0.5 mg
ET Tube	3.5	Atropine	0.13 mg	Ibuprofen	N/A
Blade Size	1	Amiodarone	30 mg	Ipratropium	500 mcg
Defibrillation		Calcium Chloride	130 mg	Levalbuterol	0.31 mg
Defibrillation	10 J, 20 J	Charcoal	HOLD	Lidocaine	6 mg
Cardioversion	2 J, 5 J	Dextrose 10%	35 ml	Lorazepam	0.33 mg
Normal Saline		Diazepam (IV)	1.3 mg	Magnesium Sulfate	300 mg
130 ml		(Rectal)	3.2 mg	Methylprednisolone	12.5 mg
		Dilaudid	HOLD	Midazolam	0.5 mg
		Diphenhydramine	5 mg	Morphine Sulfate	0.6 mg
		Dopamine (800 mg in 500 cc)		Naloxone	0.6 mg
		2 mcg/kg/min	0.5 ml/hr	Ondansetron	1.0 mg
		5 mcg/kg/min	1.3 ml/hr	Prednisone	6.5 mg
		10 mcg/kg/min	2.5 ml/hr	Sodium Bicarbonate	6 mEq
		20 mcg/kg/min	5.0 ml/hr		

Length 66.5-74 cm		Weight 8-9 Kg (Avg 8.5 Kg)		Red (7-10 Months)	
Vital Signs		Acetaminophen	128 mg	Epinephrine 1:10,000	0.08 mg
Heart Rate	120	Adenosine 1 st Dose-	0.9 mg	Epinephrine 1:1000 Nebulized	2.0 mg
Respirations	24-32	Repeat Dose-	1.8 mg	Epinephrine 1:1000 IM	0.08 mg
BP Systolic	92 (+/-30)	Afrin Nasal Spray	HOLD	Fentanyl	17.0 mcg
Equipment		Albuterol	2.5 mg	Glucagon	0.5 mg
ET Tube	3.5-4.0	Atropine	0.17 mg	Ibuprofen	4.0 ml
Blade Size	1	Amiodarone	40 mg	Ipratropium	500 mcg
Defibrillation		Calcium Chloride	170 mg	Levalbuterol	0.31 mg
Defibrillation	20 J, 40 J	Charcoal	HOLD	Lidocaine	8 mg
Cardioversion	5 J, 9 J	Dextrose 10%	43 ml	Lorazepam	0.43 mg
Normal Saline		Diazepam (IV)	1.7 mg	Magnesium Sulfate	400 mg
170 ml		(Rectal)	4.25 mg	Methylprednisolone	12.5 mg
		Dilaudid	HOLD	Midazolam	0.85 mg
		Diphenhydramine	10 mg	Morphine Sulfate	0.8 mg
		Dopamine (800 mg in 500 cc)		Naloxone	0.8 mg
		2 mcg/kg/min	0.7 ml/hr	Ondansetron	1.2 mg
		5 mcg/kg/min	1.6 ml/hr	Prednisone	8.5 mg
		10 mcg/kg/min	3.2 ml/hr	Sodium Bicarbonate	8 mEq
		20 mcg/kg/min	6.5 ml/hr		



Pediatric Color Coded Drug List



Weight 10-11 Kg (Avg 10.5 Kg)

Length 74-84.5 cm

Vital Signs	
Heart Rate	115-120
Respirations	22-30
BP Systolic	96 (+/-30)

Equipment	
ET Tube	4.0
Blade Size	1

Defibrillation	
Defibrillation	20 J, 40 J
Cardioversion	5 J, 10 J

Normal Saline	210 ml
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Acetaminophen	160 mg
Adenosine	1 st Dose- 0.9 mg
	Repeat Dose- 1.8 mg
Afrin Nasal Spray	HOLD
Albuterol	2.5 mg
Atropine	0.2 mg
Amiodarone	50 mg
Calcium Chloride	210 mg
Charcoal	HOLD
Dextrose 10%	50 ml
Diazepam	(IV) 1.0 mg
	(Rectal) 5.0 mg
Dilaudid	HOLD
Diphenhydramine	10 mg
Dopamine	(800 mg in 500 ml Normal Saline)
	2 mcg/kg/min 0.8 ml/hr
	5 mcg/kg/min 2.0 ml/hr
	10 mcg/kg/min 4.0 ml/hr
	20 mcg/kg/min 8.0 ml/hr

Epinephrine 1:10,000	0.1 mg
Epinephrine 1:1000 IM	0.1 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	21.0 mcg
Glucagon	1.0 mg
Ibuprofen	5.0 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	10 mg
Lorazepam	0.53 mg
Magnesium Sulfate	500 mg
Methylprednisolone	18.75 mg
Midazolam	1.0 mg
Morphine Sulfate	1.0 mg
Naloxone	1.0 mg
Ondansetron	1.6 mg
Prednisone	10.5 mg
Sodium Bicarbonate	10 mEq

Purple (11-18 Months)

Weight 12-14 Kg (Avg 13 Kg)

Length 84.5-97.5 cm

Vital Signs	
Heart Rate	110-115
Respirations	20-28
BP Systolic	100(+/-30)

Equipment	
ET Tube	4.5
Blade Size	2

Defibrillation	
Defibrillation	30 J, 50 J
Cardioversion	6 J, 15 J

Normal Saline	260 ml
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Acetaminophen	192 mg
Adenosine	1 st Dose- 1.2 mg
	Repeat Dose- 2.4 mg
Afrin Nasal Spray	1 spray
Albuterol	2.5 mg
Atropine	0.26 mg
Amiodarone	65 mg
Calcium Chloride	260 mg
Charcoal	15 gms
Dextrose 10%	60-80 ml
Diazepam	(IV) 2.6 mg
	(Rectal) 6.5 mg
Dilaudid	HOLD
Diphenhydramine	10 mg
Dopamine	(800 mg in 500 ml Normal Saline)
	2 mcg/kg/min 0.8 ml/hr
	5 mcg/kg/min 2.5 ml/hr
	10 mcg/kg/min 5.0 ml/hr
	20 mcg/kg/min 10 ml/hr

Epinephrine 1:10,000	0.10 mg
Epinephrine 1:1000 IM	0.10 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	26.0 mcg
Glucagon	0.5 mg
Ibuprofen	6.5 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	14 mg
Lorazepam	0.65 mg
Magnesium Sulfate	650 mg
Methylprednisolone	25.0 mg
Midazolam	1 mg
Morphine Sulfate	1.0 mg
Naloxone	1.3 mg
Ondansetron	2.0 mg
Prednisone	13.0 mg
Sodium Bicarbonate	13 mEq

Yellow (19-35 Months)

Weight 15-18 Kg (Avg 16.5 Kg)

Length 97.5-110 cm

Vital Signs	
Heart Rate	100-15
Respirations	20-26
BP Systolic	100(+/-20)

Equipment	
ET Tube	5.0
Blade Size	2

Defibrillation	
Defibrillation	30 J, 70 J
Cardioversion	8 J, 15 J

Normal Saline	330 ml
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Acetaminophen	240 mg
Adenosine	1 st Dose- 1.8 mg
	Repeat Dose- 3.6 mg
Afrin Nasal Spray	1 spray
Albuterol	2.5 mg
Atropine	0.32 mg
Amiodarone	80 mg
Calcium Chloride	330 mg
Charcoal	15-30 gms
Dextrose 10%	80 ml
Diazepam	(IV) 3.3 mg
	(Rectal) 8.25 mg
Dilaudid	HOLD
Diphenhydramine	15 mg
Dopamine	(800 mg in 500 ml Normal Saline)
	2 mcg/kg/min 1.2 ml/hr
	5 mcg/kg/min 3.0 ml/hr
	10 mcg/kg/min 6.0 ml/hr
	20 mcg/kg/min 12 ml/hr

Epinephrine 1:10,000	0.16 mg
Epinephrine 1:1000 IM	0.20 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	33.0 mcg
Glucagon	0.5 mg
Ibuprofen	8.0 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	15 mg
Lorazepam	0.83 mg
Magnesium Sulfate	800 mg
Methylprednisolone	31.25 mg
Midazolam	1.5 mg
Morphine Sulfate	1.0 mg
Naloxone	1.6 mg
Ondansetron	2.4 mg
Prednisone	16.5 mg
Sodium Bicarbonate	16 mEq

White (3-4 yrs)



Pediatric Color Coded Drug List



Weight 19-22 Kg (Avg 20.75 Kg)

Length 110-122 cm

Vital Signs	
Heart Rate	100
Respirations	20-24
BP Systolic	100(+/-15)

Equipment	
ET Tube	5.5
Blade Size	2

Defibrillation	
Defibrillation	40 J, 85 J
Cardioversion	10 J, 20 J

Normal Saline	410 ml
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Acetaminophen	288 mg
Adenosine	1 st Dose- 2.1 mg
	Repeat Dose- 4.1 mg
Afrin Nasal Spray	1 spray
Albuterol	2.5 mg
Atropine	0.4 mg
Amiodarone	100 mg
Calcium Chloride	420 mg
Charcoal	20-40 gms
Dextrose 10%	100 ml
Diazepam	(IV) 4.0 mg
	(Rectal) 10.0 mg
Dilaudid	0.31 mg
Diphenhydramine	25.0 mg
Dopamine	(800 mg in 500 ml Normal Saline)
	2 mcg/kg/min 1.6 ml/hr
	5 mcg/kg/min 3.9 ml/hr
	10 mcg/kg/min 7.8 ml/hr
	20 mcg/kg/min 16 ml/hr

Epinephrine 1:10,000	0.2 mg
Epinephrine 1:1000 IM	0.2 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	40.0 mcg
Glucagon	1.0 mg
Ibuprofen	10.0 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	20 mg
Lorazepam	1.0 mg
Magnesium Sulfate	1000 mg
Methylprednisolone	37.5 mg
Midazolam	2.0 mg
Morphine Sulfate	2.0 mg
Naloxone	2.0 mg
Ondansetron	3.0 mg
Prednisone	20.0 mg
Sodium Bicarbonate	20 mEq

Blue (5-6 yrs)

Weight 24-30 Kg (Avg 27 Kg)

Length 122-137 cm

Vital Signs	
Heart Rate	90
Respirations	18-22
BP Systolic	105(+/-15)

Equipment	
ET Tube	6.0
Blade Size	2-3

Defibrillation	
Defibrillation	50 J, 100 J
Cardioversion	15 J, 30 J

Normal Saline	540 ml
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Acetaminophen	384 mg
Adenosine	1 st Dose- 2.7 mg
	Repeat Dose- 5.4 mg
Afrin Nasal Spray	1 spray
Albuterol	2.5 mg
Atropine	0.5 mg
Amiodarone	135 mg
Calcium Chloride	540 mg
Charcoal	25-50 gms
Dextrose 10%	135 ml
Diazepam	(IV) 4.0 mg
	(Rectal) 10.0 mg
Dilaudid	0.4 mg
Diphenhydramine	25 mg
Dopamine	(800 mg in 500 ml Normal Saline)
	2 mcg/kg/min 2 ml/hr
	5 mcg/kg/min 5 ml/hr
	10 mcg/kg/min 10 ml/hr
	20 mcg/kg/min 20 ml/hr

Epinephrine 1:10,000	0.27 mg
Epinephrine 1:1000 IM	0.3 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	54.0 mcg
Glucagon	1.0 mg
Ibuprofen	13 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	20 mg
Lorazepam	1.35 mg
Magnesium Sulfate	1350 mg
Methylprednisolone	54.0 mg
Midazolam	2.0 mg
Morphine Sulfate	2.0 mg
Naloxone	2.0 mg
Ondansetron	4.0 mg
Prednisone	27.0 mg
Sodium Bicarbonate	27 mEq

Orange (7-9 yrs)

Weight 32-40 Kg (Avg 36 Kg)

Length 137-150 cm

Vital Signs	
Heart Rate	85-90
Respirations	16-22
BP Systolic	115(+/-20)

Equipment	
ET Tube	6.5
Blade Size	3

Defibrillation	
Defibrillation	60 J, 150 J
Cardioversion	15 J, 30 J

Normal Saline	720 ml
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Acetaminophen	544 mg
Adenosine	1 st Dose- 3.6 mg
	Repeat Dose- 7.2 mg
Afrin Nasal Spray	2 spray
Albuterol	2.5 mg
Atropine	0.5 mg
Amiodarone	180 mg
Calcium Chloride	700 mg
Charcoal	25-50 gms
Dextrose 10%	180 ml
Diazepam	(IV) 4.0 mg
	(Rectal) 10.0 mg
Dilaudid	0.54 mg
Diphenhydramine	35 mg
Dopamine	(800 mg in 500 ml Normal Saline)
	2 mcg/kg/min 2.7 ml/hr
	5 mcg/kg/min 7.0 ml/hr
	10 mcg/kg/min 14.0 ml/hr
	20 mcg/kg/min 28.0 ml/hr

Epinephrine 1:10,000	0.3 mg
Epinephrine 1:1000 IM	0.3 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	62.0 mcg
Glucagon	1.0 mg
Ibuprofen	18 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	36 mg
Lorazepam	1.8 mg
Magnesium Sulfate	1800 mg
Methylprednisolone	62.5 mg
Midazolam	2.0 mg
Morphine Sulfate	3.0 mg
Naloxone	2.0 mg
Ondansetron	4.0 mg
Prednisone	36.0 mg
Sodium Bicarbonate	36 mEq

Green (10-12 yrs)

Standards Procedure (Skill)

12/15 Lead ECG

Clinical Indications:

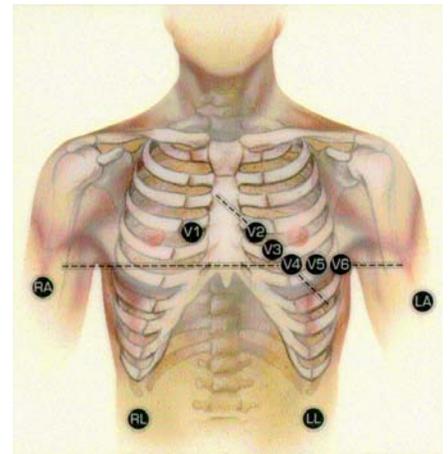
- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Assess patient and monitor cardiac status with the 3 lead ECG.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG. A 12 lead ECG should be performed before the administration of nitroglycerin.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:

- RA -Right arm
- LA -Left arm
- 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 midclavicular line
- V5 -Level with V4 at left anterior axillary line
- V6 -Level with V5 at left midaxillary line



8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data to the appropriate hospital if available.
12. Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. The second 12 lead should be obtained by applying the V4 chest lead to the 5th intercostal space at the midclavicular line on the right side of the chest, the V5 chest lead to the V8 position at the midscapular line and the V6 chest lead to the V9 position at the left paraspinal line.
15. Instruct the patient to remain still.
16. Press the appropriate button to acquire the 12 Lead ECG.
17. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the lead acquisition will be interrupted until the noise is removed.
18. Label the printed 12 lead to identify V4 as V4R, V5 as V8 and V6 as V9 and notify the hospital if there is indication of posterior or right heart involvement.

Standards Procedure (Skill)

12/15 Lead ECG



19. Monitor the patient while continuing with the treatment protocol.
20. Download data as per guidelines and attach a copy of the 12/15 lead to the ACR.
21. Document the procedure, time, and results on/with the patient care report (PCR)

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 local EMS System. Assessment should include direct observation at least once per certification cycle.

EMT and EMT-Intermediate personnel should maintain the knowledge and technical skills to acquire the ECG's as described. However, interpretation is still the role of the EMT-Paramedic.



Airway: BIAD-Combitube

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask (BVM) or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- 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.
- Patient must be ≥ 5 feet and ≥ 16 years of age and must be unconscious.

Procedure:

B	EMT	B
I	EMT- I	I
P	EMT- P	P

1. Preoxygenate and hyperventilate the patient.
 2. Lubricate the tube.
 3. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
 4. Gently insert the tube until the teeth are between the printed rings.
 5. Inflate line 1 (blue pilot balloon) leading to the pharyngeal cuff with 100 cc of air.
 6. Inflate line 2 (white pilot balloon) leading to the distal cuff with 15 cc of air.
 7. **Ventilate the patient through the longer blue tube.**
 - Auscultate for breath sounds and sounds over the epigastrium.
 - Look for the chest to rise and fall.
 8. **If breath sounds are positive and epigastric sounds are negative, continue ventilation through the blue tube. The tube is in the esophagus.**
 - In the esophageal mode, stomach contents can be aspirated through the #2, white tube relieving gastric distention.
 9. If breath sounds are negative and epigastric sounds are positive, attempt ventilation through the shorter, #2 white tube and reassess for lung and epigastric sounds. If breath sounds are present and the chest rises, you have intubated the trachea and continue ventilation through the shorter tube.
 10. The device is secured by the large pharyngeal balloon.
 11. **Confirm tube placement using end-tidal CO₂ detector or esophageal bulb device.**
 12. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
 13. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**
- **Endotracheal intubation with a Combitube in Place (Only if ventilation unsuccessful):**
 - If you cannot ventilate with the Combitube in place, you should remove the tube, open and suction the airway, and ventilate with a BVM prior to intubation or re-establishment of another BIAD.

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



Airway: BIAD King

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- 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.
- Patient must be unconscious.

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Preoxygenate and hyperventilate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflate the pilot balloon with 45-90 ml of air depending on the size of the device used.
7. **Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.**
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. **Confirm tube placement using end-tidal CO₂ detector.**
11. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
12. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



Airway: BIAD-Laryngeal Mask Airway (LMA)

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- 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.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- **This airway does not prevent aspiration of stomach contents.**

Clinical Contraindications:

- Deforming Facial Trauma
- Pulmonary Fibrosis
- Morbid Obesity

Procedure:

1. Select the appropriate tube size for the patient.
2. Check the tube for proper inflation and deflation.
3. Completely deflate the tube prior to insertion.
4. Lubricate with a water-soluble jelly.
5. Pre-Oxygenate the patient with 100% Oxygen
6. Insert the LMA into the hypopharynx until resistance is met.
7. Inflate the cuff until a seal is obtained.
8. Connect the LMA to an ambu bag and assess for breath sounds and air entry.
9. **Confirm tube placement using end-tidal CO₂ detector or esophageal bulb device.**
10. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
11. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
12. Re-verify LMA placement after every move and upon arrival in the ED
13. Document the procedure, time, and result (success) on/with the patient care report (PCR)
14. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

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 local EMS System. Assessment should include direct observation once per certification cycle.



Airway: CPAP

I	EMT- I	I
P	EMT- P	P

Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:

- CPAP is indicated in all patients whom inadequate ventilation is suspected that is not associated with Asthma. This could be as a result of pulmonary edema, pneumonia, COPD, etc.

Clinical Contraindications for Continuous Positive Airway Pressure (CPAP) Use:

- Decreased Mental Status.
- Facial features or deformities that prevent an adequate mask seal.
- Excessive respiratory secretions.

Procedure:

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 through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. If the Positive End Expiratory Pressure (PEEP) is adjustable on the CPAP device adjust the PEEP beginning at 0 cmH₂0 of pressure and slowly titrate to achieve a positive pressure as follows:
 - 5 – 10 cmH₂0 for Pulmonary Edema, Near Drowning, possible aspiration or pneumonia
 - 3 – 5 cm H₂0 for COPD
7. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
8. Titrate oxygen levels to the patient's response. Many patients respond to low FIO₂ (30-50%).
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for optimal use of the CPAP device.
10. Document time and response on patient care report (PCR).

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 local EMS System.



Airway: Cricothyrotomy-Surgical

Clinical Indications:

P EMT-P P

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient \geq 12 years old.

Procedure:

1. Have suction and supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Prep the area with an antiseptic swab (Betadine).
4. Attach a 5-cc syringe to an 18G - 1 & 1/2-inch needle.
5. Insert the needle (with syringe attached) perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
6. During needle insertion, gentle aspiration should be applied to the syringe. Rapid aspiration of air into the syringe indicates successful entry into the trachea. Do not advance the needle any further. Attach forceps and remove syringe.
7. With the needle remaining in place, make a 1-inch vertical incision through the skin and subcutaneous tissue above and below the needle using a scalpel. Using blunt dissection technique, expose the cricothyroid membrane. This is a bloody procedure. The needle should act as a guide to the cricothyroid membrane.
8. With the needle still in place, make a horizontal stabbing incision approx. 1/2 inch through the membrane on each side of the needle. Remove the needle.
9. Using (skin hook, tracheal hook, or gloved finger) to maintain surgical opening, insert the cuffed tube into the trachea. (Cric tube from the kit or a #6 endotracheal tube is usually sufficient).
10. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
11. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, end-tidal CO₂ detector, etc.) Esophageal bulb devices are not accurate with this procedure.
12. Secure the tube.
13. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
14. 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 and after each movement of the patient.
15. Consider placing an NG or OG tube to clear stomach contents after the airway is secured.
- 16. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
- 17. It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

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 local EMS System.

Airway: Needle Cric / Pediatric

Clinical Indications:

P EMT-P P

- Pediatric Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient < 11 years of age.

Procedure:

1. Have suction and supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Prep the area with an antiseptic swab (Betadine).
4. Use a 14G - 1 & 1/2-inch needle, or appropriate selected size for patient size.
5. Insert the needle perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
6. Be careful during insertion as to not progress posteriorly but in a caudal direction.
7. Remove needle leaving the catheter in place.
8. Attach the BVM adapter from a 3.0 or 3.5 ET Tube to the catheter and provide oxygenation with oxygen attached to the BVM.
9. Monitor pulse ox – SPO2 should improve if circulation is adequate. ETCO2 will be of limited benefit since elimination of CO2 through a needle cric is difficult.
10. Secure the catheter in place.
11. Document needle/catheter size, time, result (success).
12. Document all devices used to confirm oxygenation and after each movement of the patient.
- 13. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Pulse Oximetry.**
- 14. It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

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 local EMS System.



Airway: Endotracheal Tube Introducer (Bougie)

Clinical Indications:

- Patients meet clinical indications for oral intubation
- Initial intubation attempt(s) unsuccessful
- Predicted difficult intubation

I	EMT- I	I
P	EMT- P	P

Contraindications:

- Three attempts at orotracheal intubation (utilize failed airway protocol)
- Age less than eight (8) or ETT size less than 6.5 mm

Procedure:

1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ET tube without stylet, test cuff and prepare suction;
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed;
5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized;
6. Once inserted, gently advance the Bougie until you meet resistance or "hold-up" (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated);
7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie;
8. Gently advance the Bougie and loaded ET tube until you have hold-up again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie;
9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT);
11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie;
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 to 10 cc of air, auscultate for equal breath sounds and reposition accordingly;
13. When final position is determined secure the ET tube, reassess breath sounds, apply end tidal CO2 monitor, and record and monitor readings to assure continued tracheal intubation.

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



Airway: Foreign Body Obstruction

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

Procedure:

- Assess the degree of foreign body obstruction
 - Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
 - In severe foreign-body obstructions, the patient may not be able to make a sound. The victim may clutch his/her neck in the universal choking sign.
- For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
- For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
- For adults**, a combination of maneuvers may be required.
 - First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
 - If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy
- If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.
- Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
- In unresponsive patients, EMT-Intermediate and EMT-Paramedic level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magil forceps.
- Document the methods used and result of these procedures in the patient care report (PCR).

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 local EMS System.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Airway Intubation Confirmation – End-Tidal CO₂ Detector



Clinical Indications:

- The End-Tidal CO₂ detector shall be used with any Endotracheal Tube or Blind Insertion Airway Device use.

B	EMT	B
I	EMT- I	I
P	EMT- P	P

It is strongly recommended that continuous Capnography be used in place of or in addition to the use of an End-Tidal CO₂ detector.

Procedure:

- Attach End-Tidal CO₂ detector to the Blind Insertion Airway Device or the Endotracheal Tube.
- Note color change. A color change or CO₂ detection will be documented on each respiratory failure or cardiac arrest patient.
- The CO₂ detector shall remain in place with the airway and monitored throughout the prehospital care and transport unless continuous Capnography is used. Any loss of CO₂ detection or color change is to be documented and monitored as procedures are done to verify or correct the airway problem.
- Tube placement should be verified frequently and always with each patient move or loss of color change in the End-Tidal CO₂ detector.
- Document the procedure and the results on/with the Patient Care Report (PCR) as well as on the Airway Evaluation Form.

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 local EMS System.



Airway: Intubation Confirmation-Esophageal Bulb

Clinical Indications:

- To assist in determining and documenting the correct placement of an Endotracheal or Nasotracheal tube.

B	EMT	B
I	EMT- I	I
P	EMT- P	P

It is strongly recommended that continuous Capnography be used in place of or in addition to the use of an Esophageal Bulb device.

Procedure:

- Complete intubation as per Airway-Intubation Oral or Airway-Intubation Nasal procedures.
- Place the bulb device over the proximal end of the ETT or NTT. Squeeze the bulb to remove all air prior to securing the bulb on the tube.
- Once secured on the tube, release the bulb.
- If the bulb expands evenly and easily, this indicates probable tracheal intubation. Assessment of the patient's breath sounds bilaterally should also be performed.
- If the bulb does not expand easily, this indicates possible esophageal intubation and the need to reassess the airway.
- Document time and result in the patient care report (PCR).
- Do not repeat test since a false positive test can result from instillation of air into the esophagus.

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 local EMS System.



Airway: Rapid Sequence Intubation

Clinical Indications:

P EMT-P P

- Need for advanced airway control in a patient who has a gag reflex
- or trismus (jaw clinching)
- Failure to protect the airway. Unable to ventilate and / or oxygenate. Impending airway compromise
- A minimum of 2 EMT-Paramedics on scene able to participate in patient care

Clinical Contraindications:

- Age \leq 11 years of age.
- Refer to drug list for contraindications regarding use of Succinylcholine and Rocuronium.

Procedure:

1. Perform focused neurological exam
2. Evaluate for difficult airway (LEMON)-see appendix
3. Prepare equipment (intubation kit, BVM, suction, RSI medications, BIAD, Cricothyrotomy kit, waveform capnography, other airway adjuncts as available)
4. Pre-oxygenate patient with 100% oxygen via NRB mask or BVM. Apneic oxygenation: May continue high-flow oxygen via NC during entire procedure
5. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
6. Ensure functioning IV / IO access. Two (2) IV sites are preferable
7. Stroke / head trauma suspected? If yes, Lidocaine 1.5 mg/kg (per local medical director)
8. In-line c-spine stabilization by second caregiver (in setting of trauma)
9. Administer Etomidate (preferred agent) or Ketamine by rapid IV push
10. Administer Succinylcholine (preferred agent), await fasciculation and jaw relaxation or Rocuronium
11. Apply cricoid pressure (by third caregiver). This is optional and may improve or worsen view
12. Intubate trachea
13. Verify ET placement through auscultation, Capnography, and Pulse Oximetry
14. May repeat Succinylcholine or Rocuronium if inadequate relaxation
15. Release cricoid pressure (if utilized) and secure tube
- 16. Continuous Capnography and Pulse Oximetry is required for RSI. Pre-intubation, minimal during intubation, and post-intubation readings must be recorded in the PCR.**
17. Re-verify tube placement after every move and upon arrival in the ED
18. 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/methods used to confirm initial tube placement initially and with patient movement.
19. Consider placing a gastric tube to clear stomach contents after the airway is secured.
- 20. Completion of the Airway Evaluation Form is required including a signature from the receiving physician at the Emergency Department confirming proper tube placement**

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



Airway: Intubation Nasotracheal

Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- A spontaneously breathing patient in need of intubation (inadequate respiratory effort, evidence of hypoxia or carbon dioxide retention, or need for airway protection).
- Rigidity or clenched teeth prohibiting other airway procedures.
- Patient must be 12 years of age or older.

Procedure:

1. Premedicate the patient with nasal spray.
2. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
3. Preoxygenate the patient. Lubricate the tube. The use of a BAAM device is recommended.
4. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
5. Continue to pass the tube listening for air movement and looking for to and fro vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.
6. Gently and evenly advance the tube through the glottic opening on the inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
7. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
8. Auscultate for bilaterally equal breath sounds and absence of sounds of the epigastrium. Observe for symmetrical chest expansion. The 15mm adapter usually rests close to the nostril with proper positioning.
9. Inflate the cuff with 5-10 cc of air.
- 10. Confirm tube placement using an end-tidal CO₂ monitoring or esophageal bulb device.**
11. Secure the tube.
12. Reassess airway and breath sounds after transfer to the stretcher and during transport. These tubes are easily dislodged and require close monitoring and frequent reassessment.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).
- 14. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
- 15. It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

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 local EMS System.



Airway: Intubation Oral Tracheal

Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- A component of Drug Assisted Intubation

Procedure:

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.
5. Visualize tube passing through vocal cords.
- 6. Confirm and document tube placement using an end-tidal CO₂ monitoring or esophageal bulb device.**
7. Inflate the cuff with 3-to10 cc of air; secure the tube to the patient's face.
8. 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.
9. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
10. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
11. 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.
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
- 13. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
- 14. It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Airway – Nebulizer Inhalation Therapy



Clinical Indications:

- Patients experiencing bronchospasm.

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (such as Albuterol or other approved drug) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.
9. Document the treatment, dose, and route on/with the patient care report (PCR).

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 local EMS System.



Airway: Respirator Operation

Clinical Indications:

- Transport of an intubated patient

I	EMT - I	I
P	EMT - P	P

Procedure:

1. Confirm the placement of tube as per airway protocol.
2. Ensure adequate oxygen delivery to the respirator device.
3. Preoxygenate the patient as much as possible with bag-valve mask.
4. Remove BVM and attach tube to respiration device.
5. Per instructions of device, set initial respiration values. For example, set an inspiratory:expiratory ratio of 1:4 (for every 1 second of inspiration, allow 4 seconds and expiration) with a rate of 12 to 20.
6. Assess breath sounds. Allow for adequate expiratory time. Adjust respirator setting as clinically indicated.
7. **It is required that patients on a transport ventilator should be monitored continuously through Capnography and Pulse Oximetry. The ventilatory rate should adjusted to maintain a pulse oximetry of >90 (or as high as possible) while maintaining a pCO2 of 30-35.**
8. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the respirator, remove the respirator and resume bag-valve mask ventilations.
9. Document time, complications, and patient response on the patient care report (PCR).

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 local EMS System.



Airway: Suctioning-Advanced

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

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

Procedure:

1. Ensure suction device is in proper working order.
2. Preoxygenate the patient as is possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway into 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).
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 the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
8. A small amount of Normal Saline (10 ml) may be used if needed to loosen secretions for suctioning.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient
10. Document time and result in the patient care report (PCR).

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 local EMS System.



Airway: Suctioning-Basic

B	EMT	B
I	EMT- I	I
P	EMT- P	P

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.

Procedure:

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 which 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).

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 local EMS System.



Airway: Tracheostomy Tube Change

Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- Presence of Tracheostomy site.
- Urgent or emergent indication to change the tube, such as obstruction that will not clear with suction, dislodgement, or inability to oxygenate/ventilate the patient without other obvious explanation.

Procedure:

1. Have all airway equipment prepared for standard airway management, including equipment of orotracheal intubation and failed airway.
2. Have airway device (endotracheal tube or tracheostomy tube) of the same size as the tracheostomy tube currently in place as well as 0.5 size smaller available (e.g., if the patient has a #6.0 Shilley, then have a 6.0 and a 5.5 tube).
3. Lubricate the replacement tube(s) and check the cuff.
4. Remove the tracheostomy tube from mechanical ventilation devices and use a bag-valve apparatus to pre-oxygenate the patient as much as possible.
5. Once all equipment is in place, remove devices securing the tracheostomy tube, including sutures and/or supporting bandages.
6. If applicable, deflate the cuff on the tube. If unable to aspirate air with a syringe, cut the balloon off to allow the cuff to lose pressure.
7. Remove the tracheostomy tube.
8. Insert the replacement tube. Confirm placement via standard measures except for esophageal detection (which is ineffective for surgical airways).
9. If there is any difficulty placing the tube, re-attempt procedure with the smaller tube.
10. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation (as per protocol). **More difficulty with tube changing can be anticipated for tracheostomy sites that are immature – i.e., less than two weeks old. Great caution should be exercised in attempts to change immature tracheostomy sites.**
11. Document procedure, confirmation, patient response, and any complications in the PCR

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 local EMS System. Assessment for this skill should include direct observation at least once per certification cycle.



Airway: Ventilator Operation

Clinical Indications:

P EMT-P P

- Management of the ventilation of a patient during a prolonged or interfacility transport of an intubated patient.

Procedure:

1. Transporting personnel should review the operation of the ventilator with the treating personnel (physician, nurse, or respiratory therapy) in the referring facility prior to transport if possible.
2. All ventilator settings, including respiratory rate, FiO_2 , mode of ventilation, and tidal volumes should be recorded prior to initiating transport. Additionally, the recent trends in oxygen saturation experienced by the patient should be noted.
3. Prior to transport, specific orders regarding any anticipated changes to ventilator settings as well as causes for significant alarm should be reviewed with the referring medical personnel as well as medical control.
4. Once in the transporting unit, confirm adequate oxygen delivery to the ventilator.
5. Frequently assess breath sounds to assess for possible tube dislodgment during transfer.
6. Frequently assess the patient's respiratory status, noting any decreases in oxygen saturation or changes in tidal volumes, peak pressures, etc.
7. Note any changes in ventilator settings or patient condition in the PCR.
8. Consider placing an NG or OG tube to clear stomach contents.
- 9. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
10. If any significant change in patient condition, including vital signs or oxygen saturation or there is a concern regarding ventilator performance/alerts, remove the ventilator from the endotracheal tube and use a bag-valve mask with 100% O_2 . Contact medical control immediately.

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 local EMS System.



Arterial Access: Blood Draw

Clinical Indications:

P EMT-P P

- Arterial blood gas (ABG) analysis
- Other needs for arterial blood as indicated by medical control

Procedure:

1. Assemble ABG kit, ice, alcohol wipes, and gloves.
2. Determine if there is any history of trauma or any other difficulties with circulation to either hand. If a problem does exist, do not use that extremity for the blood draw.
3. Palpate the radial pulse just proximal to the wrist.
4. Clean the skin with an alcohol wipe.
5. Insert the ABG syringe at a 45 to 60 degree angle over the area of the pulse.
6. Slowly advance the syringe, watching for return of arterial blood. You do not need to aspirate but rather allow the syringe to fill from the arterial pressure.
7. Once the sample has been acquired, remove and discard the needle in an approved fashion.
8. Place the small airtight cap over the needle port on the syringe. Remove air from the sample by inverting the syringe and pressing the plunger on the syringe until a small amount of the sample enters the airtight cap.
9. Place the sample on ice as soon as possible
10. Hold pressure over the blood draw sight for at least 5 minutes before checking to ensure hemostasis.
11. Record procedure, time, and any complications in patient care report (PCR)

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 local EMS System.



Arterial Access: Line Maintenance

Clinical Indications:

P EMT-P P

- Transport of a patient with an existing arterial line.

Procedure:

1. Make certain arterial line is secured prior to transport, including intersection of arterial catheter and IV/Monitoring lines.
2. Use available equipment for monitoring of arterial pressures via arterial line.
3. Do not use the arterial line for administration of any fluids or medications.
4. If there is any question regarding dislodgement of the arterial line and bleeding results, remove the line and apply direct pressure over the site for at least five minutes before checking to ensure hemostasis.

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 local EMS System.



Assessment: Adult

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Any patient requesting a medical evaluation that is too large to be measured with a Broselow-Luten Resuscitation Tape.

Procedure:

- Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
- Assess need for additional resources.
- Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
- Assess mental status (e.g., AVPU) and disability (e.g., GCS).
- Control major hemorrhage and assess overall priority of patient.
- Perform a focused history and physical based on patient's chief complaint.
- Assess need for critical interventions.
- Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
- Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions.
- Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.

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 local EMS System.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Pain Assessment and Documentation



Clinical Indications:

- Any patient with pain.

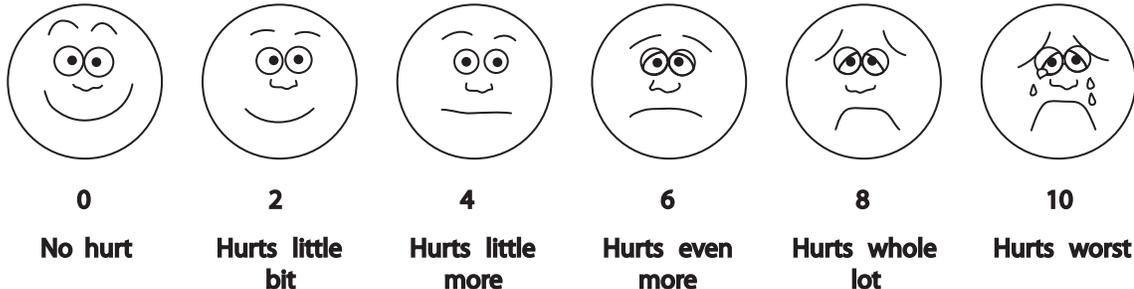
Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

- Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
- Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment, and with each set of vitals.
- Pain should be assessed using the appropriate approved scale.
- Three pain scales are available: the 0 – 10, the Wong - Baker "faces", and the FLACC.
 - 0 – 10 Scale: the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
 - Wong – Baker "FACES" scale: this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.



From Hockenberry MJ, Wilson D, Winkelstein ML: Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

- FLACC scale: this scale has been validated for measuring pain in children with mild to severe cognitive impairment and in pre-verbal children (including infants).

CATEGORIES	SCORING		
	0	1	2
FACE	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested.	Frequent to constant quivering chin, clenched jaw.
LEGS	Normal position or relaxed.	Uneasy, restless, tense.	Kicking, or legs drawn up.
ACTIVITY	Lying quietly, normal position moves easily.	Squirming, shifting back and forth, tense.	Arched, rigid or jerking.
CRY	No cry, (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints.
CONSOLABILITY	Content, relaxed.	Reassured by occasional touching hugging or being talked to, distractable.	Difficulty to console or comfort

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 local EMS System.



Assessment: Pediatric

Clinical Indications:

- Any child that can be measured with the Broselow-Luten Resuscitation Tape.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

- Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
- Assess patient using the pediatric triangle of ABCs:
 - Airway and appearance: speech/cry, muscle tone, inter-activeness, look/gaze, movement of extremities
 - Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning
 - Circulation to skin: pallor, mottling, cyanosis
- Establish spinal immobilization if suspicion of spinal injury
- Establish responsiveness appropriate for age (AVPU, GCS, etc.)
- Color code using Broselow-Luten tape
- Assess disability (pulse, motor function, sensory function, papillary reaction)
- Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
- Record vital signs (BP > 3 years of age, cap refill < 3 years of age)
- Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
- Treat chief complaint as per protocol

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 local EMS System.



Blood Glucose Analysis

Clinical Indications:

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

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
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 are noted, and/or as recommended by the manufacturer and document in the log.

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 local EMS System.



Capnography

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Capnography shall be used when available with the use of all invasive airway procedures including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography should also be used when possible with CPAP.

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO₂ level and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO₂ detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.

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 local EMS System.



Cardiac: External Pacing

P EMT-P P

Clinical Indications:

- Patients with symptomatic bradycardia (less than 60 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
 - Chest Pain
 - Hypotension
 - Pulmonary Edema
 - Altered Mental Status, Confusion, etc.
 - Ventricular Ectopy
- Asystole, pacing must be done early to be effective.
- PEA, where the underlying rhythm is bradycardic and reversible causes have been treated.

Procedure:

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
 - 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.

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Cardiopulmonary Resuscitation (CPR)



Clinical Indications:

- Basic life support for the patient in cardiac arrest

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Assess the patient's level of responsiveness (shake and shout)
2. If no response, open the patient's airway with the head-tilt, chin-lift and look, listen, and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway.
3. Check for pulse (carotid for adults and older children, brachial for infants) for at least 10 seconds. If no pulse, begin chest compressions based on chart below:

Age	Location	Depth	Rate
Infant	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1.5 inches	At least 100/minute
Child	Over sternum, just cephalad from xyphoid process, heel of one hand	2 inches	At least 100/minute (3 compressions Every 2 seconds)
Adult	Over sternum, just cephalad from xyphoid process, hands with interlocked fingers	At least 2 inches	At least 100/minute (3 compressions Every 2 seconds)

4. If patient is an adult, go to step 5. If no respiratory effort in a pediatric patient, give two ventilations. If air moves successfully, go to step 5. If air movement fails, proceed to the Airway Obstruction Procedure.
5. Go to Cardiac Arrest Procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure
6. Provide 8 - 10 breaths per minute with the BVM. Use EtCO2 to guide your ventilations as directed in the Cardiac Arrest Protocol.
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions (< 5 seconds with a maximum of 10 seconds) are allowed for rhythm analysis, defibrillation, and performance of procedures
8. Document the time and procedure in the Patient Care Report (PCR).

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 local EMS System.



Cardioversion

P EMT-P P

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)

Procedure:

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 or sedating medications.
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 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. Consider discussion with medical control if cardioversion is unsuccessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).

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 local EMS System. Assessment should include direct observation at least once per certification cycle., or other mechanisms as deemed appropriate by the local EMS System.



Chest Decompression

Clinical Indications:

P EMT-P P

- 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.
- 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.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
 - Locate the second intercostals space in the mid-clavicular line on the same side as the pneumothorax.
 - If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.
 - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (14 gauge for adults) 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 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 an 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.)

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 local EMS System. Assessment should include direct observation once per certification cycle.



Childbirth

Clinical Indications:

- Imminent delivery with crowning

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Protocol** for further treatment.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

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 local EMS System.



CNS Catheter: Epidural Catheter Maintenance

Clinical Indications:

P EMT-P P

- Presence of an epidural catheter in a patient requiring transport

Procedure:

1. Prior to transport, ensure catheter is secure and that transport personnel are familiar with medication(s) being delivered and devices used to control medication administration.
2. No adjustments in catheter position are to be attempted.
3. No adjustments in medication dosage or administration are to be attempted without direct approval from on-line medical control.
4. Report any complications immediately to on-line medical control.
5. Document the time and dose of any medication administration or rate adjustment in the patient care report (PCR).

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 local EMS System.



North Carolina College of Emergency Physicians Standards Procedure (Skill) CNS Catheter: Ventricular Catheter Maintenance



Clinical Indications:

P	EMT- P	P
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- Transport of a patient with an intra-ventricular catheter in place

Procedure:

1. Prior to transport, ensure the catheter is secure.
2. Prior to transport, determine from the referring hospital/physician the desired patient position (e.g., supine, head of bed elevated 30 degrees, etc.).
3. Prior to transport, determine the height at which the drain is to be maintained, given the patient position desired from #2 above (if applicable).
4. Do not manipulate or move the drain.
5. If the patient or height of the drain is altered, immediately correct based on the pre-determined configuration in step 2 and 3 above.
6. Report any problems immediately to on-line medical control.
7. Document the time and any adjustments or problems in the patient care report (PCR).

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 local EMS System.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Decontamination



	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

Procedure:

- In coordination with HazMAT and other Emergency Management personnel, establish hot, warm and cold zones of operation.
- Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
- In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
 - Removal of patients from Hot Zone
 - Simple removal of clothing
 - Irrigation of eyes
 - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
- Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination.
- Assist patients with technical decontamination (unless contraindicated based on #3 above). This may include removal of all clothing and gentle cleansing with soap and water. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided.
- Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel affects for law enforcement.
- Monitor all patients for environmental illness.
- Transport patients per local protocol.

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 local EMS System.



Defibrillation: Automated

Clinical Indications:

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

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Contraindication:

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

Procedure:

1. **If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Apply defibrillator pads per manufacturer recommendations. Based on 2010 guidelines, place pads preferably in AP or AL position when implanted devices (pacemakers, AICDs) occupy preferred pad positions and attempt to avoid placing directly over device.
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 preprogrammed 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.**
13. **If pulse returns please use the Post Resuscitation Protocol**

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



Defibrillation: Manual

P EMT-P P

Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

Procedure:

1. **Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position
 - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS
 - Pads: anterior-posterior position

For patients with implanted pacers/defibrillators, paddles or pads can be in AP or AL positions. The presence of implanted pacers/defibrillators should not delay defibrillation. Attempt to avoid placing paddles or pads directly above device.
4. Set the appropriate energy level
5. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**
6. If using paddles, assure proper contact by applying 25 pounds of pressure on each paddle.
7. **Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
8. Deliver the countershock by depressing the discharge button(s) when using paddles, or depress the **shock button** for hands free operation.
9. 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.
10. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
11. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



Gastric Tube Insertion

Clinical Indications:

P EMT-P P

- Gastric decompression in intubated patients or for administration of activated charcoal in patients with altered mental status.

Procedure:

1. Estimate insertion length by superimposing the tube over the body from the nose to the stomach.
2. Flex the neck **if not contraindicated** to facilitate esophageal passage.
3. Liberally lubricate the distal end of the tube and pass through the patient's nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates. This increases the difficulty of the insertion and may cause bleeding.
4. In the setting of an intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred after securing airway.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 20cc of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
7. Secure the tube.
8. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

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 local EMS System.



Injections: Subcutaneous and Intramuscular

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ (not auto-injector) or IM route or as an alternative route in selected medications.

Procedure:

- Receive and confirm medication order or perform according to standing orders.
- Prepare equipment and medication expelling air from the syringe.
- Explain the procedure to the patient and reconfirm patient allergies.
- The most common site for subcutaneous injection is the arm.
 - Injection volume should not exceed 1 cc.
- The possible injection sites for intramuscular injections include the arm, buttock and thigh.
 - Injection volume should not exceed 1 cc for the arm
 - Injection volume should not exceed 2 cc in the thigh or buttock.
- The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
- Expose the selected area and cleanse the injection site with alcohol.
- Insert the needle into the skin with a smooth, steady motion

SQ: 45-degree angle
skin pinched

IM: 90-degree angle
skin flattened

- Aspirate for blood
- Inject the medication.
- Withdraw the needle quickly and dispose of properly without recapping.
- Apply pressure to the site.
- Monitor the patient for the desired therapeutic effects as well as any possible side effects.
- Document the medication, dose, route, and time on/with the patient care report (PCR).

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 local EMS System.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Orthostatic Blood Pressure Measurement



	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization. Orthostatic vital signs are not routinely recommended.
- Patients \geq 8 years of age, or patients larger than the Broselow-Luten tape
- Orthostatic Vital Signs are not sensitive nor specific for volume loss / dehydration and may induce syncope in some cases. Assessment of orthostatic vital signs are not routinely recommended. Local Medical Director should indicate and educate on situations where they may be helpful.

Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 30 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.

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 local EMS System.



Pulse Oximetry

Clinical Indications:

- Patients with suspected hypoxemia.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
2. Allow machine to register saturation level.
3. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
4. Verify pulse rate on machine with actual pulse of the patient.
5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
7. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain. Supplemental oxygen is not required if the oxyhemoglobin saturation is $\geq 94\%$, unless there are obvious signs of heart failure, dyspneic, or hypoxic to maintain to 94%.
10. Factors which may reduce the reliability of the pulse oximetry reading include but are not limited to:
 - Poor peripheral circulation (blood volume, hypotension, hypothermia)
 - Excessive pulse oximeter sensor motion
 - Fingernail polish (may be removed with acetone pad)
 - Carbon monoxide bound to hemoglobin
 - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
 - Jaundice
 - Placement of BP cuff on same extremity as pulse ox probe.

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 local EMS System.



Reperfusion Checklist

Clinical Indications:

Rapid evaluation of a patient with suspected acute stroke and/or acute myocardial infarction (STEMI) to:

- Determine eligibility and potential benefit from fibrinolysis..
- Rapid identification of patients who are not eligible for fibrinolysis and will require interventional therapy.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Follow the appropriate protocol for the patient's complaint to assess and identify an acute condition which could potentially benefit from fibrinolysis. If a positive finding is noted on one of the following assessments, proceed to step 2.
 - Perform a 12-lead ECG to identify an acute ST elevation myocardial infarction (STEMI).
 - Perform the Los Angeles Pre-hospital Stroke Screen to identify an acute stroke
2. Complete the Reperfusion Check Sheet to identify any potential contraindications to fibrinolysis. (See Appendix)
 - Systolic Blood Pressure greater than 180 mm Hg
 - Diastolic Blood Pressure greater than 110 mm Hg
 - Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
 - History of structural Central Nervous System disease (age \geq 18, history of aneurysm or AV-malformation, tumors, masses, hemorrhage, etc.)
 - Significant closed head or facial trauma within the previous 3 months
 - Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
 - Bleeding or clotting problem or on blood thinners
 - CPR performed greater than 10 minutes
 - Currently Pregnant
 - Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.
3. Identify if the patient is currently in heart failure or cardiogenic shock. For these patients, a percutaneous coronary intervention is more effective.
 - Presence of pulmonary edema (rales greater than halfway up lung fields)
 - Systemic hypoperfusion (cool and clammy)
4. If any contraindication is noted using the check list and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligible patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.
5. Record all findings in the Patient Care Report (PCR).

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 local EMS System.



Restraints: Physical

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

Procedure:

- Attempt less restrictive means of managing the patient.
- Request law enforcement assistance and **Contact Medical Control**.
- Ensure that there are sufficient personnel available to physically restrain the patient safely.
- Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other devices will be on top of the patient. The patient will never be restrained in the prone position.
- The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
- The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This **MUST** be documented on the PCR.
- Documentation on/with the patient care report (PCR) should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed. Use of the Restraint Checklist is highly recommended.
- If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. (Chemical restraint may be considered earlier.)
- If a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel can not remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.

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 local EMS System.



Spinal Immobilization

Clinical Indications:

- Need for spinal immobilization as determined by protocol

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Gather a backboard, straps, C-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head.
2. Explain the procedure to the patient
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applied the collar.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself.)
5. Place the patient on a long spine board with the log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
7. NOTE: Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital. Special equipment such as football players in full pads and helmet may remain immobilized with helmet and pads in place.
8. Document the time of the procedure in the patient care report (PCR).

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 local EMS System.



Splinting

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

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

Procedure:

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 both 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, kerlex, 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:
 - Assess neurovascular function as in #1 above.
 - Place the ankle device over the ankle.
 - 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
 - Extend the distal end of the splint at least 6 inches beyond the foot.
 - Attach the ankle device to the traction crank.
 - Twist until moderate resistance is met.
 - 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).

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 local EMS System.



Stroke Screen: LA Prehospital

Clinical Indications:

- Suspected Stroke Patient

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Assess and treat suspected stroke patients as per protocol.
2. The Los Angeles Prehospital Stroke Screen (LAPSS) form should be completed for all suspected stroke patients (see appendix). There are six screening criteria items on the LAPSS form.
3. Screen the patient for the following criteria:
 - Age over 45 years
 - No history of a seizure disorder
 - New onset of symptoms in last 24 hours
 - Patient ambulatory prior to event
 - Blood glucose between 60-400
4. The final criterion consists of performing a patient exam looking for facial droop, unilateral grip weakness/absence, or unilateral arm weakness. One of these exam components must be positive to answer “yes” on the screening form.
5. **If all of the LAPSS screening criteria are met (“yes” to all criteria OR if unknown), follow the EMS System Stroke Plan and alert the receiving hospital of a possible stroke patient as early as possible.**
6. All sections of the LAPSS form must be completed.
7. The completed LAPSS form should be attached or documented in the PCR.

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 local EMS System.



Temperature Measurement

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.

Procedure:

- For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 3 to 5 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 6 to 8 below).
- To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient’s tongue with appropriate sterile covering.
- Have the patient seal their mouth closed around thermometer.
- If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the “beep” or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 9.
- Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient’s complaint.
- To obtain a rectal temperature, cover the thermometer with an appropriate sterile cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
- Follow guidelines in step 5 above to obtain temperature.
- Record time, temperature, method (oral, rectal), and scale (C° or F°) in Patient Care Report (PCR).

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 local EMS System.



Urinary Catheterization

Clinical Indications:

P EMT-P P

- Monitoring a patient's fluid status and/or response to therapy during transport.
- Collection of urine for laboratory analysis.
- Patients with medical (but NOT TRAUMA) complaints over the age of 16.

Procedure:

1. Explain the procedure to the patient. Maximize patient privacy. Have a second crewmember or other chaperone if performing the procedure on a member of the opposite sex.
2. If there is any question of traumatic injury in the Genitourinary (GU) region, do not perform this procedure.
3. Open the catheter kit. Test the balloon at the catheter tip. Connect the catheter to the urine collection system. Maintain the sterility of contents.
4. Use sterile gloves from the kit. Use one hand to come in contact with the patient and the other to use items from the kit. Recall that once your hand touches the patient, it is no longer sterile and cannot be used to obtain items from the kit.
5. Using the Betadine swabs from the kit, thoroughly cleanse the area surrounding the urethra. For males, this will require retracting the foreskin for uncircumcised males and cleansing of the glans for all males. For females, this will require retraction of the labia majora and cleansing of the area around the urethra.
6. Once the patient has been prepped with Betadine, place sterile sheet(s).
7. Lubricate the tip of the catheter.
8. Gently guide the catheter through the external opening of the urethra. Advance the catheter slowly until there is return of urine. Do not force the catheter through resistance. If resistance is encountered, withdraw the catheter slightly and gently re-direct the catheter.
9. Once urine is returned, gently inflate the balloon and secure the urine collection device.
10. Record procedure and amount of urine returned in the Patient Care Report (PCR).

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 local EMS System.



Venous Access: Blood Draw

Clinical Indications:

- Collection of a patient's blood for laboratory analysis

I	EMT- I	I
P	EMT- P	P

Procedure:

1. Utilize universal precautions as per OSHA.
2. Select vein and prep as usual.
3. Select appropriate blood-drawing devices.
4. Draw appropriate tubes of blood for lab testing.
5. Assure that the blood samples are labeled with the correct information (a minimum of the patients name, along with the date and time the sample was collected).
6. Deliver the blood tubes to the appropriate individual at the hospital.

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 local EMS System.



North Carolina College of Emergency Physicians
Standards Procedure (Skill)
Venous Access: Central Line Maintenance



Clinical Indications:

P **EMT- P** **P**

- Transport of a patient with a central venous pressure line already in place

Procedure:

1. Prior to transportation, ensure the line is secure.
2. Medications and IV fluids may be administered through a central venous pressure line. Such infusions must be held while the central venous pressure is transduced to obtain a central venous pressure, but may be restarted afterwards.
3. Do not manipulate the central venous catheter.
4. If the central venous catheter becomes dysfunctional, does not allow drug administration, or becomes dislodged, contact medical control.
5. Document the time of any pressure measurements, the pressure obtained, and any medication administration in the patient care report (PCR).

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 local EMS System.



Venous Access: Existing Catheters

Clinical Indications:

P EMT-P P

- Inability to obtain adequate peripheral access.
- Access of an existing venous catheter for medication or fluid administration.
- Central venous access in a patient in cardiac arrest.

Procedure:

1. Clean the port of the catheter with alcohol wipe.
2. Using sterile technique, withdraw 5-10 ml of blood and discard syringe in sharps container.
3. Using 5cc 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 4. 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).

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 local EMS System.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Venous Access: External Jugular Access



I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

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 local EMS System.



Venous Access: Extremity

Clinical Indications:

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

I	EMT- I	I
P	EMT- P	P

Procedure:

- 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.
- Paramedics can use intraosseous access where threat to life exists as provided for in the Venous Access-Intraosseous procedure.
- Use the largest catheter bore necessary based upon the patient's condition and size of veins.
- Fluid and setup choice is preferably:
 - Lactated Ringers with a macro drip (10 gtt/cc) for burns
 - Normal Saline with a macro drip (10 gtt/cc) for medical conditions, trauma or hypotension
 - Normal Saline with a micro drip (60 gtt/cc) for medication infusions
- Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
- Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
- Place a tourniquet around the patient's extremity to restrict venous flow only.
- Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
- Prep the skin with an antiseptic solution.
- Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
- Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
- Draw blood samples when appropriate.
- Remove the tourniquet and connect the IV tubing or saline lock.
- Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.

Rates are preferably:

- Adult: KVO: 60 cc/hr (1 gtt/ 6 sec for a macro drip set)
- Pediatric: KVO: 30 cc/hr (1 gtt/ 12 sec for a macro drip set)

If shock is present:

- Adult: 500 cc fluid boluses repeated as long as lungs are dry and BP < 90. Consider a second IV line.
- Pediatric: 20 cc/kg boluses repeated PRN for poor perfusion.

- Cover the site with a sterile dressing and secure the IV and tubing.
- Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.
- Document the procedure, time and result (success) on/with the patient care report (PCR).

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 local EMS System.



P EMT-P P

Clinical Indications:

- Central venous access in a patient with an urgent need for fluid or medication administration.
- Inability to obtain adequate peripheral access.
- Patient aged greater than 16 years.
- No evidence of pelvic trauma.
- No evidence of trauma in the extremity in which the catheter is to be placed.

Procedure:

1. Obtain central access kit with 6.0 to 8.0 French cordis and equipment to place catheter by Selinger technique.
2. Completely expose the groin area on the side where the catheter is to be placed.
3. Palpate the femoral pulse in the inguinal crease. Recall that the inguinal ligament connects the pubic symphysis with the anterior, superior iliac spine and that all attempts at access should be made inferior to this ligament to avoid inadvertent entry into the abdominal cavity.
4. Once the femoral pulse has been palpated distal to the ilio-inguinal ligament, prep a large area of the skin with Betadine.
5. Use sterile gloves and place sterile drapes around the Betadine-prepped field.
6. With one hand, palpate the femoral pulse. The femoral vein will be located medially when compared with the femoral artery.
7. With the introducing needle from the kit, enter the skin over the anticipated position of the femoral vein. Gently aspirate as the needle is advanced. Angle the needle approximately 45 to 60 degrees in reference to the skin on the thigh.
8. Once non-pulsatile, venous blood is obtained, stop advancing the needle and hold the needle in position. Remove the syringe and observe the hub for pulsatile flow. If the blood appears arterial and/or is pulsatile, immediately remove the needle and apply direct pressure over the site. Once bleeding is controlled, return to step 7 above or consider the other extremity, if there are no contraindications.
9. If the needle appears to be in the femoral vein, insert the guide wire with sterile technique. Stop advancing the wire if there is any resistance; you may gently withdraw the wire and attempt re-insertion so long as sterility is maintained.
10. Stop advancing the wire in order to leave approximately 10 cm of the wire external to the hub of the needle.
- 11. DO NOT LET GO OF THE WIRE.**
12. Holding the wire in the distal hand, remove the needle over the wire. Once the needle reaches the end of the wire, use the proximal hand to control the wire and the distal hand to remove the needle from the wire.
13. Use the scalpel to create a small incision in the skin at the base of the wire. Make certain the incision extends completely to the wire so there is no skin tag.

CONTINUED VENOUS ACCESS: FEMORAL LINE - PAGE 2



14. Place the catheter over the wire; use the wire a guide to place the catheter. Some
15. Gentle force may be required as the catheter enters the skin; this should not, however, require excessive force. Again, one hand should always maintain control of the wire.
16. Once the catheter is completely inserted, remove the wire.
17. Attach a syringe to the port of the catheter, release the clamp, and aspirate for blood. There should be an easy flow of venous blood.
18. Once all of the air has been removed from the catheter by aspirating blood, re-clamp the line.
19. Attach the desired IV fluid/blood/etc and begin infusion. **Note that “wide-open” lines will deliver large amounts of fluid quickly – monitor the patient’s fluid status closely.**
20. Secure the catheter with sterile dressing or sutures.
21. Document procedure, complications, and clinical results in the patient care report (PCR)

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



Venous Access: Intraosseous

P EMT- P P

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.
- Burns.

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.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12 years of age, identify the anteromedial aspect of the distal tibia (2 cm proximal to the medial malleolus). Proximal humerus is also an acceptable insertion site: for patients > 40 Kg, lateral aspect of the humerus, 2 cm distal to the greater tuberosity.
3. Prep the site recommended by the device manufacturer with providone-iodine ointment or solution.
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. Utilize the yellow needle for the proximal humerus. The pink needle is only intended for use in neonatal patients.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the surface and remove the injection device.
7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject at least 5 cc of NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. You may administer 10 to 20 mg (1 to 2 cc) of 2% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (6 cc).
12. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

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 local EMS System. Assessment should include direct observation at least once per certification cycle.



North Carolina College of Emergency Physicians Standards Procedure (Skill) Venous Access: Swan-Ganz Catheter Maintenance



Clinical Indications:

P

EMT-P

P

- Transport of a patient with a Swan-Ganz catheter that is in place prior to transport.

Procedure:

1. Make certain catheter is secure prior to transport.
2. Under the supervision of the nurse or physician caring for the patient, make certain the transport personnel are aware of the depth at which the catheter is secured.
3. **UNDER NO CIRCUMSTANCES SHOULD TRANSPORT PERSONNEL ADVANCE THE SWAN-GANZ CATHETER.**
4. The sterile plastic sheath that surrounds the catheter should not be manipulated.
5. The ports of the catheter may be used to continue administration of medications or IV fluids that were initiated prior to transport. These should be used as any other IV port with attention to sterile technique.
6. If applicable, measurements from the catheter may be obtained during transport and used to guide care as per local protocols and medical control orders.
7. If at anytime during the transport difficulties with the function of the Swan-Ganz catheter is noted, contact medical control.
8. Document the time and any adjustments or problems associated with the catheter in the patient care report (PCR).

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 local EMS System.



Wound Care-General

Clinical Indications:

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

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. 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).

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 local EMS System.



Wound Care-Hemostatic Agent

Clinical Indications:

- Serious hemorrhage that can not be controlled by other means.

Contraindications:

- Wounds involving open thoracic or abdominal cavities.

Procedure:

1. Apply approved non-heat-generating hemostatic agent per manufacturer’s instructions.
2. Supplement with direct pressure and standard hemorrhage control techniques.
3. Apply dressing.

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 local EMS System.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P



Wound Care-Taser® Probe Removal

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

Contraindications:

- Patients with conducted electrical weapon (Taser®) probe penetration in vulnerable areas of body as mentioned below should be transported for further evaluation and probe removal
- Probes embedded in skin above level of clavicles, female breasts, or genitalia
- Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.

Procedure:

- Ensure wires are disconnected from weapon.
- Stabilize skin around probe using non-dominant hand.
- Grasp probe by metal body with pliers or hemostats to prevent puncture wounds to EMS personnel.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.

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 local EMS System.



Wound Care-Tourniquet

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Life threatening extremity hemorrhage that can not be controlled by other means.
- Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

Contraindications:

- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

Procedure:

1. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care protocol
6. If delayed or prolonged transport and tourniquet application time > 45 minutes: consider reattempting standard hemorrhage control techniques and removing tourniquet

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 local EMS System.



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18. Poison Control
19. Safe Transport of Pediatric Patients
20. Transport
21. Rapid Sequence Induction
22. Corrections to the Patient Care Report

Standards Policy

Air Transport



Policy:

Air transport should be utilized whenever patient care can be improved by decreasing transport time or by giving advanced care not available from ground EMS services, but available from air medical transport services (i.e. blood).

Purpose:

The purpose of this policy is to:

- Improve patient care in the prehospital setting.
- Allow for expedient transport in serious, mass casualty settings.
- Provide life-saving treatment such as blood transfusion.

Procedure:

Patient transportation via ground ambulance will not be delayed to wait for helicopter transportation. If the patient is packaged and ready for transport and the helicopter is not on the ground, or within a reasonable distance, the transportation will be initiated by ground ambulance. Air medical services may be rerouted to a helipad located at or near a medical facility.

If the transport plan includes delivery of the patient to a helipad located at a qualified medical facility, it may be appropriate to bypass the Emergency Department. When bypassing the emergency Department, the following will apply:

- Notify the facility via radio of the "Bypass". It is important to use the term "Bypass". This will be the phrase that initiates the event for the facility.
- Provide a full encode to the facility as if the patient were being delivered to the Emergency Department.
- Update the Emergency Department to any changes in the patient condition.
- Be prepared to divert to the Emergency Department if conditions warrant.
- Follow facility specific guidelines outlined in this document.
- This policy may only be utilized at facilities with specific guidelines.

Air transport should be considered if any of the following criteria apply:

- High priority patient with > 20 minute transport time
- Entrapped patients with > 10 minute estimated extrication time
- Multiple casualty incident with red/yellow tag patients
- Multi-trauma or medical patient requiring life-saving treatment not available in prehospital environment (i.e., blood transfusion, invasive procedure, operative intervention)

When the need for air medical services is identified, a request should be made through Rowan Communications. Only EMT-P personnel can activate air medical resources. EMT-P personnel should be on the scene or in contact with individuals on the scene in order to make an informed decision on transport. It is not necessary to check the availability of flight services and this practice is to be avoided.

Standards Policy

Air Transport



If the scene conditions or patient situation improves after activation of the air medical transport service and air transport is determined not to be necessary, paramedic or administrative personnel may cancel the request for air transport.

Minimal Information which should be provided to the air medical transport service include:

- Number of patients
- Age of patients
- Sex of patients
- Mechanism of injury or complaint (MVC, fall, etc)

Facility Specific Guidelines

Rowan Regional Medical Center

- Approach the Emergency Department in the same manner as a normal emergency response.
- Remove the patient from the EMS unit and stage inside the ED entrance between the Emergency Department and the elevator lobby.
- Remain in the staging area until the aircraft is on the helipad. Under no circumstances will an EMS crew wait in any area other than the staging area or Emergency Department.
- Proceed to the helipad when the aircraft is available. Do not wait for the flight crew to come to the patient. The flight crew should accept the patient on the helipad.
- Should the patient deteriorate or need additional stabilization prior to transport, the patient may be delivered to the Emergency Department.
- Upon delivery to the Emergency Department, care is transferred to the facility and all patient care decisions and documentation become the responsibility of Rowan Regional Medical Center.

CMC-Northeast

- Approach the Emergency Department in the same manner as a normal emergency response.
- Stage the EMS unit in the area adjacent to the helipad entrance.
- Remain in the EMS unit until the aircraft is on the helipad. Under no circumstances will an EMS crew wait in any area other than the staging area or Emergency Department.
- Allow the flight crew to accept the patient in the EMS unit.
- Proceed to the helipad at the direction of the flight crew.
- Should the patient deteriorate or need additional stabilization prior to transport, the patient may be delivered to the Emergency Department.
- Upon delivery to the Emergency Department, care is transferred to the facility and all patient care decisions and documentation become the responsibility of CMC-Northeast.

Child Abuse Recognition and Reporting

Policy:

Child abuse is the physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

Purpose:

Assessment of a child abuse case based upon the following principles:

- **Protect** the life of the child from harm, as well as that of the EMS team from liability.
- **Suspect** that the child may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the child and family.
- **Collect** as much evidence as possible, especially information.

Procedure:

1. With all children, assess for and document psychological characteristics of abuse, including excessively passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders
2. With all children, assess for and document physical signs of abuse, including especially any injuries that are inconsistent with the reported mechanism of injury.
3. With all children, assess for and document signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Immediately report any suspicious findings to both the receiving hospital (if transported) and to agency responsible for Social Services in the county. After office hours, the child protective services worker on call can be contacted by the EMS System's 911 communications center. While law enforcement may also be notified, North Carolina law requires the EMS provider to report the suspicion of abuse to DSS. EMS should not accuse or challenge the suspected abuser. This is a legal requirement to report, not an accusation. In the event of a child fatality, law enforcement must also be notified.

Child with Special Health Care Needs (NC Kidbase)

Policy:

Medical technology, changes in the healthcare industry, and increased home health capabilities have created a special population of patients that interface with the EMS system. It is important for EMS to understand and provide quality care to children with special health care needs.

Purpose:

The purpose of this policy is to:

- Provide quality patient care and EMS services to children with special health care needs.
- Understand the need to communicate with the parents and caregivers regarding healthcare needs and devices that EMS may not have experience with.
- Promote, request, and use the “Kidbase” form, which catalogs the health care problems, needs, and issues of each child with a special healthcare need.

Procedure:

1. Caregivers who call 911 to report an emergency involving a child with special health care needs may report that the emergency involves a “Kidbase child” (if they are familiar with the NC Kidbase program) or may state that the situation involves a special needs child.
2. Responding EMS personnel should ask the caregiver of a special needs child for a copy of the “Kidbase Form”, which is the North Carolina terminology for the Emergency Information Form (EIF).
3. EMS personnel may choose to contact the child’s primary care physician for assistance with specific conditions or devices or for advice regarding appropriate treatment and/or transport of the child in the specific situation.
4. Transportation of the child, if necessary, will be made to the hospital appropriate for the specific condition of the child. In some cases this may involve bypassing the closest facility for a more distant yet more medically appropriate destination.

Criteria for Death / Withholding Resuscitation

Policy:

CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid North Carolina ***MOST and/or Do Not Resuscitate*** form (see separate policy) is present.

Purpose:

The purpose of this policy is to:

- Honor those who have obviously expired prior to EMS arrival.

Procedure:

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:
 - Body decomposition
 - Rigor mortis
 - Dependent lividity
 - Blunt force trauma
 - Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)
 - Extended downtime with Asystole on the ECG
2. If a bystander or first responder has initiated CPR or automated defibrillation prior to an EMS paramedic's arrival and any of the above criteria (signs of obvious death) are present, the paramedic may discontinue CPR and ALS therapy. All other EMS personnel levels must communicate with medical control prior to discontinuation of the resuscitative efforts.
3. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
 - a) Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy** (see separate policy)
 - b) Patient care responsibilities are transferred to the destination hospital staff.

Standards Policy

Deceased Subjects



Policy:

EMS will handle the disposition of deceased subjects in a uniform, professional, and timely manner.

Purpose:

The purpose of this policy is to:

- Organize and provide for a timely disposition of any deceased subject
- Maintain respect for the deceased and family
- Allow EMS to return to service in a timely manner.

Procedure:

1. Do not remove lines or tubes from unsuccessful cardiac arrests/codes unless directed below.
2. Notify the law enforcement agency with jurisdiction if applicable.
3. If subject was found deceased by EMS, the scene is turned over to law enforcement.
4. If EMS has attempted to resuscitate the patient and then terminated the resuscitative efforts, the EMS personnel may assist law enforcement with contacting the family physician (medical cases) or medical examiner (traumatic cases or family physician unavailable) to provide information about the resuscitative efforts.
5. Transport arrangements should be made in concert with law enforcement and the family's wishes.
6. If the deceased subject's destination is other than the county morgue, any line(s) or tube(s) placed by EMS should be removed prior to transport.
7. Document the situation, name of Physician or Medical Examiner contacted, the agency providing transport of the deceased subject, and the destination on the patient care report form (PCR).

Discontinuation of Prehospital Resuscitation

Policy:

Unsuccessful cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this procedure is followed.

Purpose:

The purpose of this policy is to:

- Allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate ALS therapy.

Procedure:

1. Discontinuation of CPR and ALS intervention may be implemented **prior to contact with Medical Control** if **ALL** of the following criteria have been met:
 - Patient must be 18 years of age or older
 - Adequate CPR has been administered
 - Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy
 - IV or IO access has been achieved
 - No evidence or suspicion of any of the following:
 - Drug/toxin overdose**
 - Active internal bleeding**
 - Hypothermia**
 - Preceding trauma**
 - Rhythm appropriate medications and defibrillation have been administered according to local EMS Protocols for a total of 3 cycles of drug therapy without return of spontaneous circulation (palpable pulse)
 - All EMS paramedic personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate
2. If all of the above criteria are not met and discontinuation of prehospital resuscitation is desired, **contact Medical Control**.
3. The **Deceased Subjects Policy** should be followed.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report (PCR).

Disposition (Patient Instructions)



Policy:

All patient encounters responded to by EMS will result in the accurate and timely completion of:

- The Patient Care Report (PCR) for all patients transported by EMS
- The Patient Disposition Form for all patients not transported by EMS

Purpose:

To provide for the documentation of:

- The evaluation and care of the patient
- The patient's refusal of the evaluation, treatment, and/or transportation
- The patient's disposition instructions
- The patient's EMS encounter to protect the local EMS system and its personnel from undue risk and liability.

Procedure:

1. All patient encounters, which result in some component of an evaluation, must have a Patient Care Report completed.
2. All patients who refuse any component of the evaluation or treatment, based on the complaint, must have a Disposition Form completed.
3. All patients who are NOT transported by EMS must have a Disposition (patient instruction) Form completed including the Patient Instruction Section.
4. A copy of the Patient Disposition Form should be maintained with the official Patient Care Report (PCR)

North Carolina Do Not Resuscitate and MOST Form

Policy:

Any patient presenting to any component of the EMS system with a completed **North Carolina Do Not Resuscitate (DNR)** form (yellow form) and/or **MOST (Medical Orders for Scope of Treatment)** form (bright pink form) shall have the form honored. Treatment will be limited as documented on the DNR or MOST form.

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 the NC DNR and/or MOST form(s), the following form content must be verified before honoring the form(s) request.
 - The form(s) must be an original North Carolina DNR form (yellow form - not a copy) and/or North Carolina MOST form (bright pink – not a copy)
 - The effective date and expiration date must be completed and current
 - The DNR and/or MOST Form must be signed by a physician, physician's assistant, or nurse practitioner.
2. A valid DNR or MOST form may be overridden by the request of:
 - The patient
 - The guardian of the patient
 - An on-scene physician

If the patient or anyone associated with the patient requests that a NC DNR and/or MOST form not be honored, EMS personnel should contact **Medical Control** to obtain assistance and direction

3. A living will or other legal document that identifies the patient's desire to withhold CPR or other medical care 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.

Policy:

The complete EMS documentation associated with an EMS events service delivery and patient care shall be electronically recorded into a Patient Care Report (PCR) within 24 hours of the completion of the EMS event with an average EMS Data Score of 5 or less.

Definition:

The EMS documentation of a Patient Care Report (PCR) is based on the appropriate and complete documentation of the EMS data elements as required and defined within the North Carolina College of Emergency Physician's EMS Standards (www.NCCEP.org). Since each EMS event and/or patient scenario is unique, only the data elements relevant to that EMS event and/or patient scenario should be completed.

The EMS Data Score is calculated on each EMS PCR as it is electronically processed into the North Carolina PreHospital Medical Information System (PreMIS). Data Quality Scores are provided within PreMIS and EMS Toolkit Reports. The best possible score is a 0 (zero) and with each data quality error a point is added to the data quality score.

A complete Patient Care Report (PCR) must contain the following information (as it relates to each EMS event and/or patient):

- Service delivery and Crew information regarding the EMS Agency's response
- Dispatch information regarding the dispatch complaint, and EMD card number
- Patient care provided prior to EMS arrival
- Patient Assessment as required by each specific complaint based protocol
- Past medical history, medications, allergies, and DNR/MOST status
- Trauma and Cardiac Arrest information if relevant to the EMS event or patient
- All times related to the event
- All procedures and their associated time
- All medications administered with their associated time
- Disposition and/or transport information
- Communication with medical control
- Appropriate Signatures (written and/or electronic)

Purpose:

The purpose of this policy is to:

- Promote timely and complete EMS documentation.
- Promote quality documentation that can be used to evaluate and improve EMS service delivery, personnel performance, and patient care to the county's citizens.
- Promote quality documentation that will decrease EMS legal and risk management liability.
- Provide a means for continuous evaluation to assure policy compliance.

EMS Documentation and Data Quality

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Patient Care Report (PCR) shall be completed as soon as possible after the time of the patient encounter. **Documentation should be completed prior to leaving the destination facility unless call demand dictates otherwise, in which case documentation must be completed prior to the end of the personnel's shift.**
2. **A copy of the patient care report form SHOULD be provided to the receiving medical facility. If the final PCR is not available at the time the patient is left with the emergency department or other healthcare facility, an interim report such as the PreMIS Preliminary Report Form MUST be provided.**
3. The PCR must be completed in the PreMIS System or electronically submitted to the PreMIS System within 24 hours of the EMS event or patient encounter's completion. The EMS data quality feedback provided at the time of the electronic submission into PreMIS should be reviewed and when possible any identified errors will be corrected within each PCR. Each PCR may be electronically resubmitted to PreMIS as many times as needed.
4. The EMS Data Quality Scores for the EMS System, EMS Agency, and individual EMS personnel will be reviewed regularly within the EMS System Peer Review Committee.

Documentation of Vital Signs



Policy:

Every patient encounter by EMS will be documented. 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 insure:

- 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)
 - GCS for Injured Patients
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
 - End Tidal CO₂ (If Invasive Airway Procedure)
 - Breath Sounds
 - Level of Response
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.

Standards Policy

Domestic Violence (Partner and/or Elder Abuse) Recognition and Reporting



Policy:

Domestic violence is physical, sexual, or psychological abuse and/or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.

Elder abuse is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and wellbeing of senior citizens.

Purpose:

Assessment of an abuse case based upon the following principles:

- **Protect** the patient from harm, as well as protecting the EMS team from harm and liability.
- **Suspect** that the patient may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the patient and family.
- **Collect** as much information and evidence as possible and preserve physical evidence.

Procedure:

1. Assess the/all patient(s) for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
2. Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
3. Assess all patients for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Immediately report any suspicious findings to both the receiving hospital (if transported). If an elder or disabled adult is involved, also contact the Department of Social Services (DSS) or equivalent in the county. After office hours, the adult social services worker on call can be contacted by the 911 communications center.
5. EMS personnel should attempt in private to provide the patient with the phone number of the local domestic violence program, or the **National Hotline, 1-800-799-SAFE**.

Policy:

All EMS Units transporting a patient to a medical facility shall transfer the care of the patient and complete all required operational tasks to be back in service for the next potential EMS event within 30 minutes of arrival to the medical facility, 90% of the time.

Definition:

The EMS Back in Service Time is defined as the time interval beginning with the time the transporting EMS Unit arrives at the medical facility destination and ending with the time the EMS Unit checks back in service and available for the next EMS event.

Purpose:

The purpose of this policy is to:

- Assure that the care of each EMS patient transported to a medical facility is transferred to the medical facility staff in a timely manner.
- Assure that the EMS unit is cleaned, disinfected, restocked, and available for the next EMS event in a timely manner.
- Assure that an interim or complete EMS patient care report (PCR) is completed and left with the receiving medical facility documenting, at a minimum, the evaluation and care provided by EMS for that patient (It is acceptable to leave the PreMIS Preliminary Report or equivalent if the final PCR cannot be completed before leaving the facility).
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Unit's priority upon arrival at the medical facility will be to transfer the care of the patient to medical facility staff as soon as possible.
2. EMS personnel will provide a verbal patient report on to the receiving medical facility staff.
3. EMS personnel will provide an interim (PreMIS Preliminary Report or equivalent) or final Patient Care Report (PCR) to the receiving medical facility staff, prior to leaving the facility, that documents at a minimum the patient's evaluation and care provided by EMS prior to arrival at the medical facility. A complete PCR should be completed as soon as possible but should not cause a delay in the EMS Back in Service Time.
4. The EMS Unit will be cleaned, disinfected, and restocked (if necessary) during the EMS Back in Service Time interval.
5. Any EMS Back in Service Time delay resulting in a prolonged EMS Back in Service Time will be documented in Patient Care Report (PCR) as an "EMS Turn-Around Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
6. All EMS Turn-Around Delays will be reviewed regularly within the EMS System Peer Review Committee.

EMS Dispatch Center Time

**Policy:**

The EMS Dispatch Center Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

Definition:

The EMS Dispatch Center Time is defined as the time interval beginning with the time the initial 911 phone call rings at the 911 Communications Center requesting emergency medical services and ending with the dispatch time of the EMS Unit responding to the event.

Purpose:

The purpose of this policy is to:

- Provide the safest and most appropriate level of response to all EMS events within the EMS System.
- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. A public calls into the 911 Communications Center requesting emergency medical assistance will never be required to speak with more than two persons before a formal EMS Unit is dispatched.
2. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.
3. EMS Units will be dispatched hot (with lights and sirens) or cold (no lights and sirens) by the 911 Call Center based on predetermined criteria. If First Responders are dispatched as a component of the EMS response, they should typically be dispatched hot (with lights and sirens).
4. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.
5. EMS Units may, at their discretion, request for a First Responder on Non-First Responder calls in situations where additional resources are required such as manpower, extreme response time of the EMS Unit, need for forcible entry, etc.

EMS Dispatch Center Time

6. EMS Units dispatched with a cold (no lights and sirens) response, will not upgrade to a hot (with lights and sirens) response **UNLESS**:
 - Public Safety personnel on-scene requests a hot (with lights and sirens) response.
 - Communications Center determines that the patient's condition has changed, and requests you to upgrade to a hot (with lights and sirens) response.
7. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF**:
 - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
 - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
 - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
 - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.
8. Any EMS Dispatch Center Time delays resulting in a prolonged EMS Dispatch Center Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Dispatch Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
9. All EMS Dispatch Delays will be reviewed regularly within the EMS System Peer Review Committee.

EMS Wheels Rolling (Turn-Out) Time

**Policy:**

The EMS Wheels Rolling (Turn-out) Time will be less than 180 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

Definition:

The EMS Wheels Rolling (Turn-out) Time is defined as the time interval beginning with the time the EMS Dispatch Center notifies an EMS Unit to respond to a specific EMS event and ending with the time the EMS Unit is moving en route to the scene of the event.

Purpose:

The purpose of this policy is to:

- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.
2. The EMS Unit will acknowledge dispatch within 90 seconds. If a unit fails to check en route within 2:59 (mm:ss), the next available EMS unit will be dispatched.
3. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.
4. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF**:
 - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
 - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
 - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
 - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.
5. Any EMS Wheels Rolling (Turn-out) Time delay resulting in a prolonged EMS Response Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Response Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
6. All EMS Response Delays will be reviewed regularly within the EMS System Peer Review Committee.

Standards Policy

Infant Abandonment



Policy:

The North Carolina Infant Homicide Prevention Act provides a mechanism for unwanted infants to be taken under temporary custody by a law enforcement officer, social services worker, healthcare provider, or EMS personnel if an infant is presented by the parent within 7 days of birth. Emergency Medical Services will accept and protect infants who are presented to EMS in this manner, until custody of the child can be released to the Department of Social Services.

*“A law enforcement officer, a department of social services worker, a health care provider as defined in G.S. 90-21.11 at a hospital or local or district health department, or an **emergency medical technician** at a fire station shall, without a court order, take into temporary custody an infant under 7 days of age that is voluntarily delivered to the individual by the infant's parent who does not express an intent to return for the infant. An individual who takes an infant into temporary custody under this subsection shall perform any act necessary to protect the physical health and well-being of the infant and shall immediately notify the department of social services. Any individual who takes an infant into temporary custody under this subsection may inquire as to the parents' identities and as to any relevant medical history, but the parent is not required to provide this information.”*

Purpose:

To provide:

- Protection to infants that are placed into the custody of EMS under this law
- Protection to EMS systems and personnel when confronted with this issue

Procedure:

1. Initiate the Pediatric Assessment Procedure.
2. Initiate Newly Born Protocol as appropriate.
3. Initiate other treatment protocols as appropriate.
4. Keep infant warm.
5. Call local Department of Social Services or the county equivalent as soon as infant is stabilized.
6. Transport infant to medical facility as per local protocol.
7. Assure infant is secured in appropriate child restraint device for transport.
8. Document protocols, procedures, and agency notifications in the PCR.

Patient Without a Protocol

Policy:

Anyone requesting EMS services will receive a professional evaluation, treatment, and transportation (if needed) in a systematic, orderly fashion regardless of the patient's problem or condition.

Purpose:

- To ensure the provision of appropriate medical care for every patient regardless of the patient's problem or condition.

Procedure:

1. Treatment and medical direction for all patient encounters, which can be triaged into an EMS patient care protocol, is to be initiated by protocol.
2. When confronted with an emergency or situation that does not fit into an existing EMS patient care protocol, the patient should be treated by the **Universal Patient Care Protocol** and a **Medical Control Physician** should be contacted for further instructions.

Standards Policy

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 North Carolina.

Purpose:

- To identify a chain of command to allow field personnel to adequately care for the patient
- To assure the patient receives the maximum benefit from prehospital care
- To minimize the liability of the EMS system as well as the on-scene physician

Procedure:

1. When a non medical-control physician offers assistance to EMS or the patient is being attended by a physician with whom they do not have an ongoing patient relationship, EMS personnel must review the On-Scene Physician Form with the physician. All requisite documentation must be verified and the physician must be approved by on-line medical control.
2. When the patient is being attended by a physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the physician if the orders conform to current EMS guidelines, and if the physician signs the PCR. Notify medical control at the earliest opportunity. Any deviation from local EMS protocols requires the physician to accompany the patient to the hospital.
3. EMS personnel may accept orders from the patient's physician over the phone with the approval of medical control. The paramedic should obtain the specific order and the physician's phone number for relay to medical control so that medical control can discuss any concerns with the physician directly.

Standards Policy

State Poison Center



Policy:

The state poison center should be utilized by the 911 centers and the responding EMS services to obtain assistance with the prehospital triage and treatment of patients who have a potential or actual poisoning.

Purpose:

The purpose of this policy is to:

- Improve the care of patients with poisonings, envenomations, and environmental/biochemical terrorism exposures in the prehospital setting.
- Provide for the most timely and appropriate level of care to the patient, including the decision to transport or treat on the scene.
- Integrate the State Poison Center into the prehospital response for hazardous materials and biochemical terrorism responses

Procedure:

1. The 911 call center will identify and if EMD capable, complete key questions for the Overdose/Poisoning, Animal Bites/Attacks, or Carbon Monoxide/Inhalation/HazMat emergency medical dispatch complaints and dispatch the appropriate EMS services and/or directly contact the State Poison Center for consultation.
2. If no immediate life threat or need for transport is identified, EMS personnel may conference the patient/caller with the Poison Center Specialist at the **State Poison Center at 800-222-1222**. If possible, dispatch personnel should remain on the line during conference evaluation.
3. The Poison Center Specialist at the State Poison Center will evaluate the exposure and make recommendations regarding the need for on-site treatment and/or hospital transport in a timely manner. If dispatch personnel are not on-line, the Specialist will recontact the 911 center and communicate these recommendations.
4. If the patient is determined to need EMS transport, the poison center Specialist will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may contact medical control for further instructions or to discuss transport options.
5. If the patient is determined not to require EMS transport, personnel will give the phone number of the patient/caller to the Poison Center Specialist. The Specialist will initiate a minimum of one follow-up call to the patient/caller to determine the status of patient.
6. Minimal information that should be obtained from the patient for the state poison center includes:
 - Name and age of patient
 - Time of exposure
 - Signs and symptoms
 - Substance(s) involved
 - Any treatment given
7. Minimal information which should be provided to the state poison center for mass poisonings, including biochemical terrorism and HazMat, includes:
 - Substance(s) involved
 - Signs and symptoms
 - Time of exposure
 - Any treatment given

Safe Transport of Pediatric Patients



Policy:

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

Purpose:

To provide:

- Provide a safe method of transporting pediatric patients within an ambulance.
- Protect the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

Procedure:

1. Drive cautiously at safe speeds observing traffic laws.
2. Tightly secure all monitoring devices and other equipment.
3. Insure that all pediatric patient less than 40 lbs are restrained with an approved child restraint device secured appropriately to the stretcher or captains chair.
3. Insure that all EMS personnel use the available restraint systems during the transport.
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. NEVER attempt to hold or allow the parents or caregivers to hold the patient during transport.

Standards Policy

Transport



Policy:

All individuals served by the EMS system will be evaluated, treated, and furnished transportation (if indicated) in the most timely and appropriate manner for each individual situation. Rowan County EMS should be considered for out of county transfers from local hospitals and medical facilities after other reasonable transport agencies have been exhausted. Rowan County EMS' primary mission is to give pre-hospital emergency care to the citizens of the county. Individuals calling for EMS services are considered unstable until and unless they receive an evaluation by qualified medical personnel.

Purpose:

To provide:

- Rapid emergency EMS transport when needed.
- Appropriate medical stabilization and treatment at the scene when necessary
- Protection of patients, EMS personnel, and citizens from undue risk when possible.

To maintain:

- The ability to care for prehospital medical emergencies occurring in the jurisdiction.

Procedure:

1. All trauma patients with significant mechanism or history for multiple system trauma will be transported as soon as possible. The scene time should be 10 minutes or less.
2. All acute Stroke and acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible. The scene time should be 10 minutes or less for acute Stroke patients and 15 minutes or less (with 12 Lead ECG) for STEMI patients
3. Other Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.
4. No patients will be transported in initial response non-transport vehicles.
5. In unusual circumstances, transport in other vehicles may be appropriate when directed by EMS administration.
6. The hospital should make arrangements with critical care transport services whenever possible for transports to out of county destinations. Critical care transport services have more personnel and equipment. These agencies are better able to handle complex, critical patients.

Standards Policy

Transport



6. Rowan County will not approve ambulance transfers in severe and dangerous weather conditions. Such examples include icy roads, hail storms, high wind warnings and hurricanes.
7. When out of county transports cannot be avoided, only one EMS unit will generally be committed to any out of county assignment at a time.
8. When EMS is called for a transport, all of the patients medical records and transfer forms should be ready. This expedites the process for EMS and the patient.
9. Support personnel such as nurses or respiratory therapists should be available to assist EMS with critical patients.
10. Facilities that are required to provide transportation services for their respective clients should be utilized.
11. Supervisors will have discretion in managing any requests for EMS transportation.

Policy:

Rapid Sequence Induction (RSI) requires an EMS System or Agency to follow these guidelines to ensure that this invasive procedure is performed in a safe and effective manner to benefit the citizens and guests of North Carolina.

Purpose:

The purpose of this policy is to:

- Ensure that the procedure is performed in a safe and effective manner
- Facilitate airway management in appropriate patients

Procedure:

1. In addition to other monitoring devices, waveform capnography and pulse oximetry are required to perform Drug-Assisted Intubation and must be monitored throughout the procedure.
2. Two EMT-Paramedics or higher-level providers must be present and participate in the airway management of the patient during the process.
3. All staff must be trained and signed off by the EMS Medical Director prior to performing Rapid Sequence Induction.
4. A printed copy or electronic download from the monitor defibrillator including the pulse oximetry, heart rhythm, waveform capnography, and blood pressure must be stored with the patient care report.
5. An EMS Airway Evaluation Form must be completed on all Rapid Sequence Induction attempts.
6. The EMS Airway Evaluation Form must be reviewed and signed by the EMS Medical Director within 7 days of the Rapid Sequence Induction.
7. All Rapid Sequence Inductions must be reviewed by the EMS System or Agency and issues identified addressed through the System Peer Review Committee.
8. A copy of the EMS Airway Evaluation Form for each Rapid Sequence Induction must be forwarded to the appropriate OEMS Regional Office at the end of each month for state review. Rowan County Emergency Services will forward the forms to the following:

Western Regional Office
3305-4 16th Avenue SE
Conover, NC 28613

Telephone: 828-466-5548

Fax: 828-466-5651

Corrections to the Patient Care Report

Policy:

Supervisors will review all patient care reports for completeness and accuracy. Missing information and unclear or incomplete work will be corrected.

Purpose:

Specifically, reports will be audited for the information required in Policy 9, EMS Documentation and Data Quality. Supervisors will have employees correct or clarify missing or unclear information.

Procedure:

1. The supervisor will fill in missing information that can be pulled from other sources such as: the computer aided dispatch system, a hospital record or nursing facility paperwork.
2. Supervisors filling in missing facts or correcting verifiable information will be recorded electronically by the reporting software. Recorded information will include the changes, time and date. Acceptable changes for the supervisors to enter include adding missing zip codes, correcting addresses based on hospital information not available to the crew at the time of the trip or filling in call times from the dispatch sheet.
3. The EMT delivering patient care must correct any missing data or unclear information on patient assessments or treatment. The other EMT on the ambulance may assist if the primary attendant is unavailable to make corrections in a timely manner.
4. The author of the patient care report can add missing information as an addendum to the report.
5. Additional facts overlooked when the call was submitted should be submitted as a separate addendum.
6. Delayed entries and addendums will be electronically signed and dated by the reporting software.
7. Late entries may not change the substantial facts of the call or misrepresent in anyway the care.