Chesterfield Rescue Squad

Protocols

Chesterfield, South Carolina

Updated 1/27/2020

The following treatment Guidelines have been developed under and approved by the Medical Director of Chesterfield Rescue in accordance with South Carolina DHEC Regulations and National Standards of Care.

These protocols are to be utilized as a guide for Chesterfield Rescue employees in patient care, however, should not supersede good common sense and sound Paramedic judgment. The effective date for the following protocols is January 6, 2020.

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Medical Director

01/06/2020
Date

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01/06/2020
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01/06/2020
Date

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Legend

Indicates a Protocol

Indicates a Medication

Indicates an Intervention or an Action

R	Responder	R
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P
M	Medical Control	M
P M	Paramedic with Online Medical Control	P M

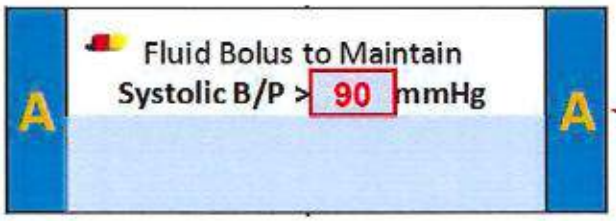
Indicates the Minimum Level of Provider authorized to perform this task

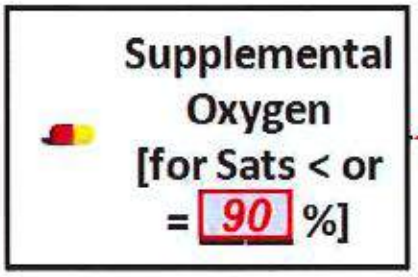
The P/M indicator allows the Paramedic to perform the intervention or medication administration only with OnLine Medical Control (OLMC)

P	Consider:: Diazepam, Lorazepam, or Midazolam for Sedation	P

Indicates an intentionally blank space left for Local Medical Control to assign dosage, route, etc.

Legend





RED Box indicates a Mandatory field that must be completed

Check BP both arms. Systolic BP 220 or Diastolic 120 or greater - taken on 2 occasions 5 minutes apart.
Pain & anxiety addressed.

Indicates a MANDATORY Protocol. All EMS Services MUST adopt this Protocol

Indicates a REQUIRED Protocol. IF an EMS Service adopts this Protocol it MUST be utilized EXACTLY as published

Universal Patient Care Protocol

Scene Safety
Bring all necessary equipment to patient s side
Demonstrate Professionalism Utilizing AIDET

PPE (Consider Airborne or Droplet if indicated)

Initial Assessment
Age Appropriate Assessment Procedure
Consider Spinal Motion Restriction [as indicated]
(PEDIATRIC: < 12 years old AND [a] < 55 Kg -or- [b] Fits on Standardized Pediatric Length Based Tape)

→ Cardiac Arrest Protocol

R	Consider F.A.S.T / R. A. C. E. Assessment	R

Airway Protocol
Age Appropriate

R	Vital Signs (Temperature if appropriate)	R
R	Pulse Oximetry	R
B	Assess Blood Glucose	B
R	Consider Supplemental **Oxygen**	R
B	Consider Cardiac Monitor / ECG **Acquisition**	B
P	Consider Cardiac Monitor / ECG **Interpretation**	P
B	Consider Capnography	B

↔ Go To Glucose Management Protocol

A patient is defined as any person who meets ANY of the following criteria:

- Receives basic or advanced medical or trauma treatment or;
- Is physically examined or;
- Has visible signs of injury or illness or has a medical complaint or;
- Requires EMS **specific** assistance to change locations and/or position or;
- Identified by any party as a possible patient because of some known, or reasonably suspected illness or injury or;
- Has a personal medical device evaluated or manipulated by EMS or;
- Requests EMS assistance with the administration of personal medications or treatments.

Exit To Appropriate Protocol

M	**Patient Does Not Fit a Protocol: Contact Medical Control**	M

Universal Patient Care Protocol

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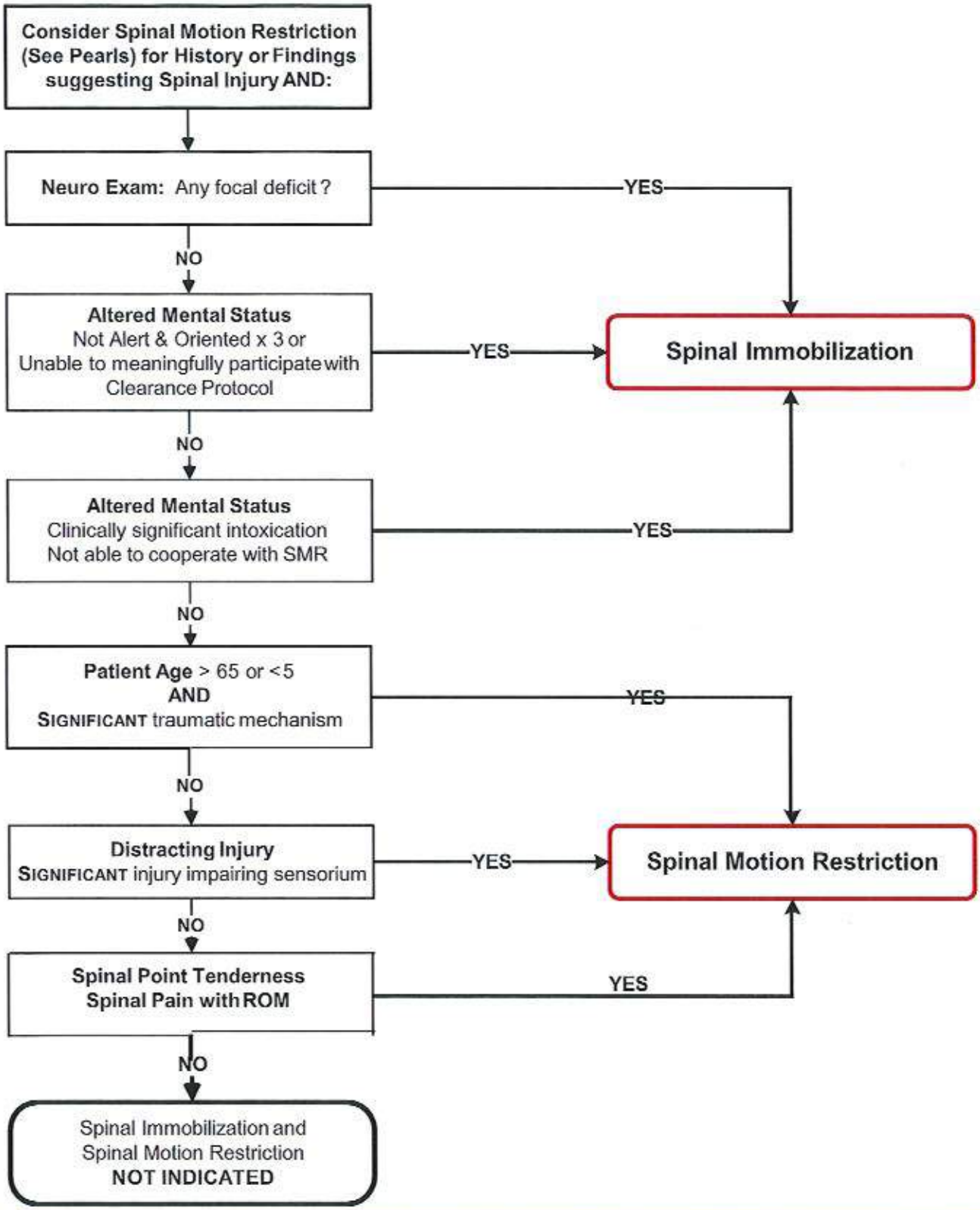
- Requires EMS **specific** assistance to change locations and/or position or;
- Identified by any party as a possible patient because of some known, or reasonably suspected illness or injury or;
- Has a personal medical device evaluated or manipulated by EMS or;
- Requests EMS assistance with the administration of personal medications or treatments.
- Any patient who requires an IV must be placed on a cardiac monitor

Completion of a PCR (ePCR) is required for any and all patient encounters.

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.**
- **Required vital signs on every patient include blood pressure, pulse, respirations, pain / severity.**
- **Pulse oximetry and temperature documentation is dependent on the specific complaint.**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Required for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- **A pediatric patient is defined as < 12 years old AND either [a] < 55 Kg -or- [b] Fits on Standardized Pediatric Length Based Tape**
- 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.

Spinal Motion Restriction



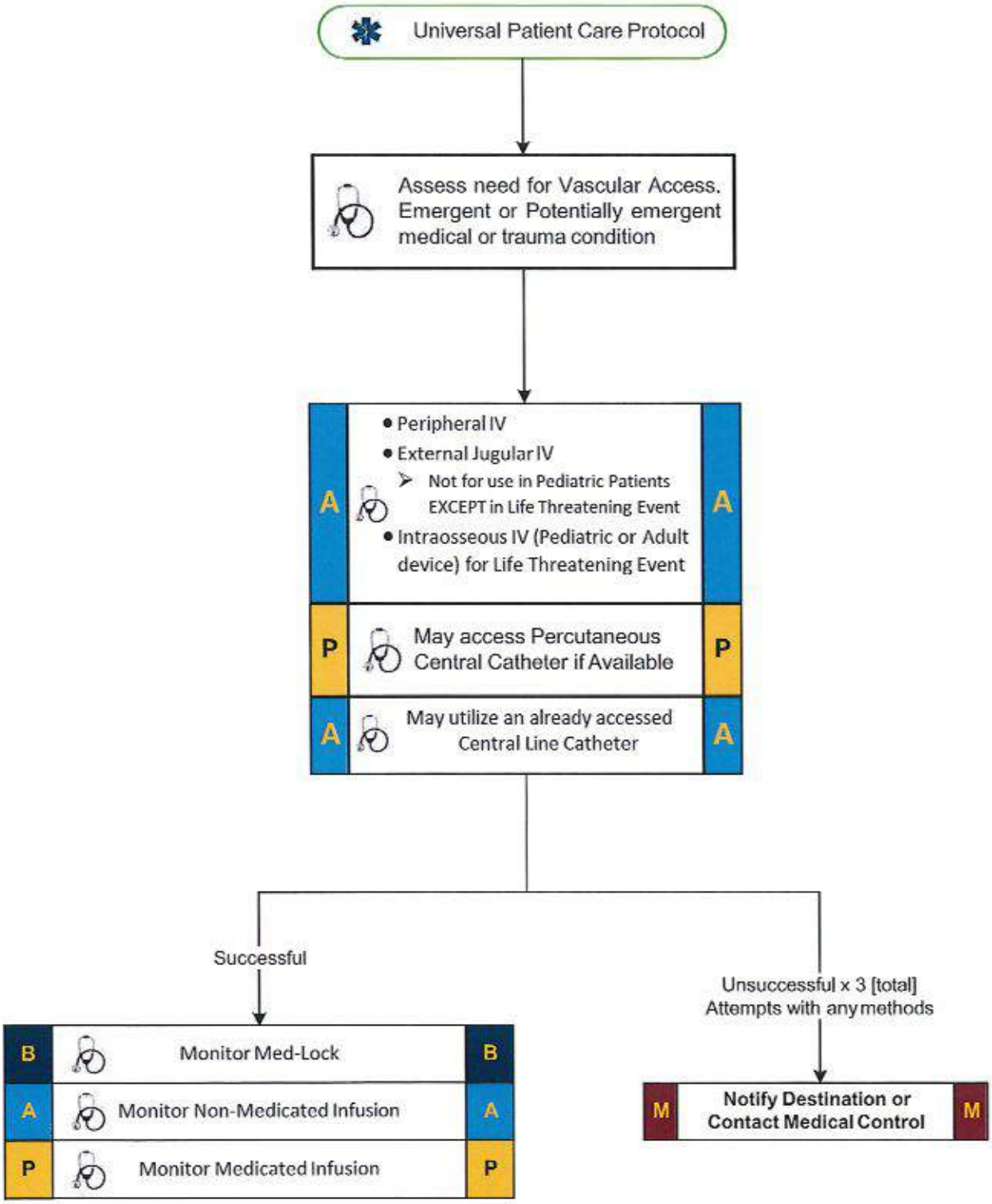
Spinal Immobilization = C-Collar + Long Spine Board / Scoop Stretcher + HID
Spinal Motion Restriction (SMR) = Cervical Collar + Patient remains in position of comfort, assisted movement to prevent extremes of spinal motion.

Spinal Motion Restriction

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Consider Spinal Motion Restriction [SMR] in any patient with arthritis, cancer, or other underlying spinal 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 motion restriction in the absence of symptoms.
- Range of motion should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted. The patient should touch their chin to their chest, extend their neck (look up), and turn their head from side to side (shoulder to shoulder) without spinal process pain.
- The acronym "NSAIDS" should be used to remember the steps in this protocol.
- "N" = Neurologic exam. Look for focal deficits such as tingling, reduced strength, on numbness in an extremity.
- "S" = Significant mechanism or extremes of age.
- "A" = Alertness. Is patient oriented to person, place, time, and situation? Any change to alertness with this incident?
- "I" = Intoxication. Is there any indication that the person is intoxicated (impaired decision making ability)?
- "D" = Distracting injury. Is there any other injury which is capable of producing significant pain in this patient?
- "S" = Spinal exam. Look for point tenderness in any spinal process or spinal process tenderness with range of motion.

Vascular Access



Vascular Access

*** TWO IV attempts MUST be made prior to establishing IO access.**

Pearls

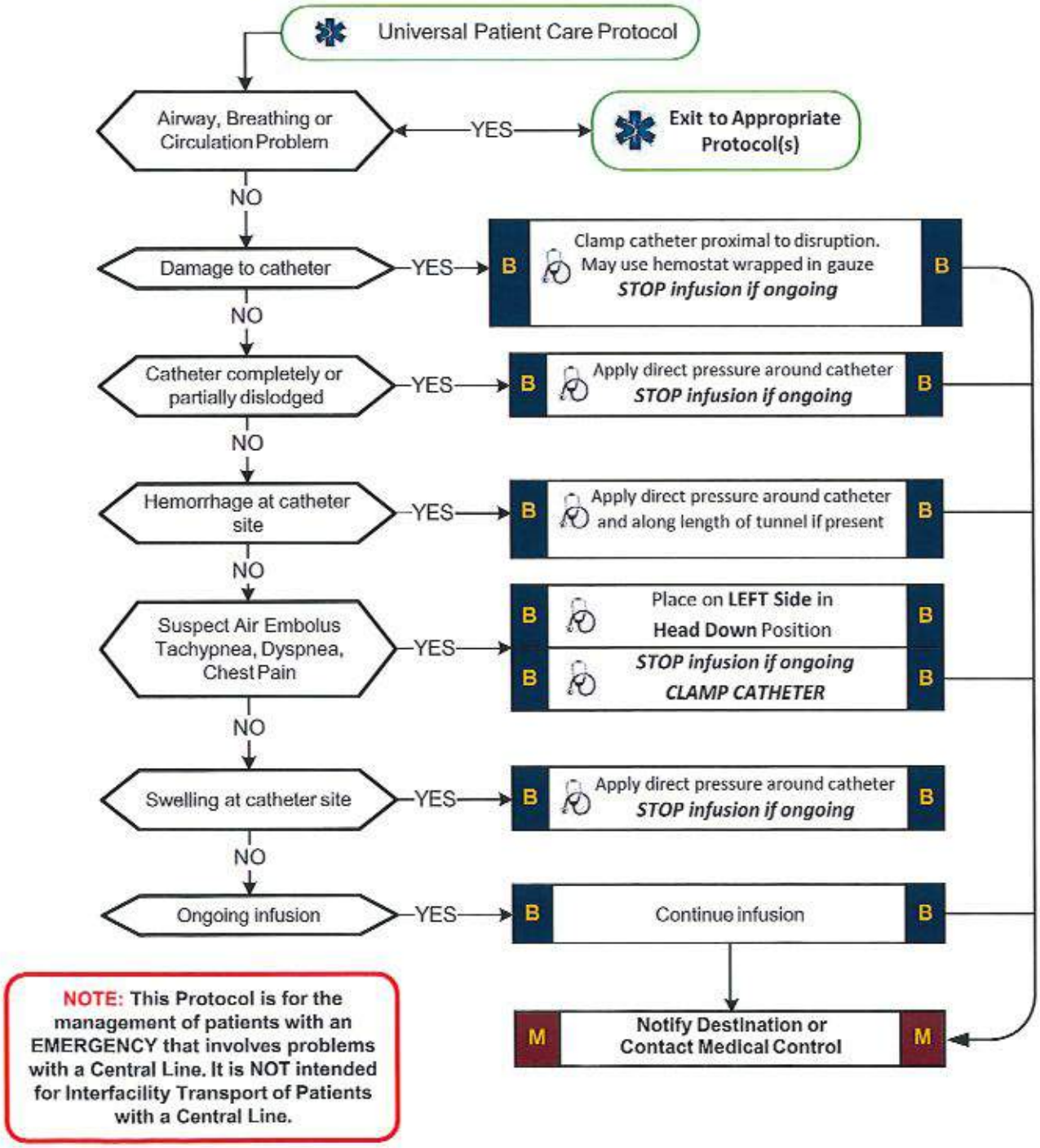
- **Any patient who requires an IV must be placed on a cardiacmonitor**
- In patients who are **NOT** hemodynamically unstable or in extremis, contact medical control prior to accessing dialysis shunts or external central venous catheters.
- In the setting of cardiac arrest, any preexisting dialysis shunt or external central venous catheter may be used.
- Intraosseous with the appropriate adult or pediatric device.
- Any prehospital fluids or medications approved for IV use, may be given through an intraosseous line.
- All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
- External jugular lines can be attempted initially in life-threatening events where no obvious peripheral site is noted.
- Any venous catheter which has already been accessed prior to EMS arrival may be used.
- Upper extremity IV sites are preferable to lower extremity sites.
- Lower extremity IV sites are discouraged in patients with vascular disease or diabetes.
- In post-mastectomy patients, avoid (if possible) IV, blood draw, injection, or blood pressure in arm on affected side.

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



NOTE: This Protocol is for the management of patients with an EMERGENCY that involves problems with a Central Line. It is NOT intended for Interfacility Transport of Patients with a Central Line.

Emergencies Involving Indwelling Central Lines

Pearls

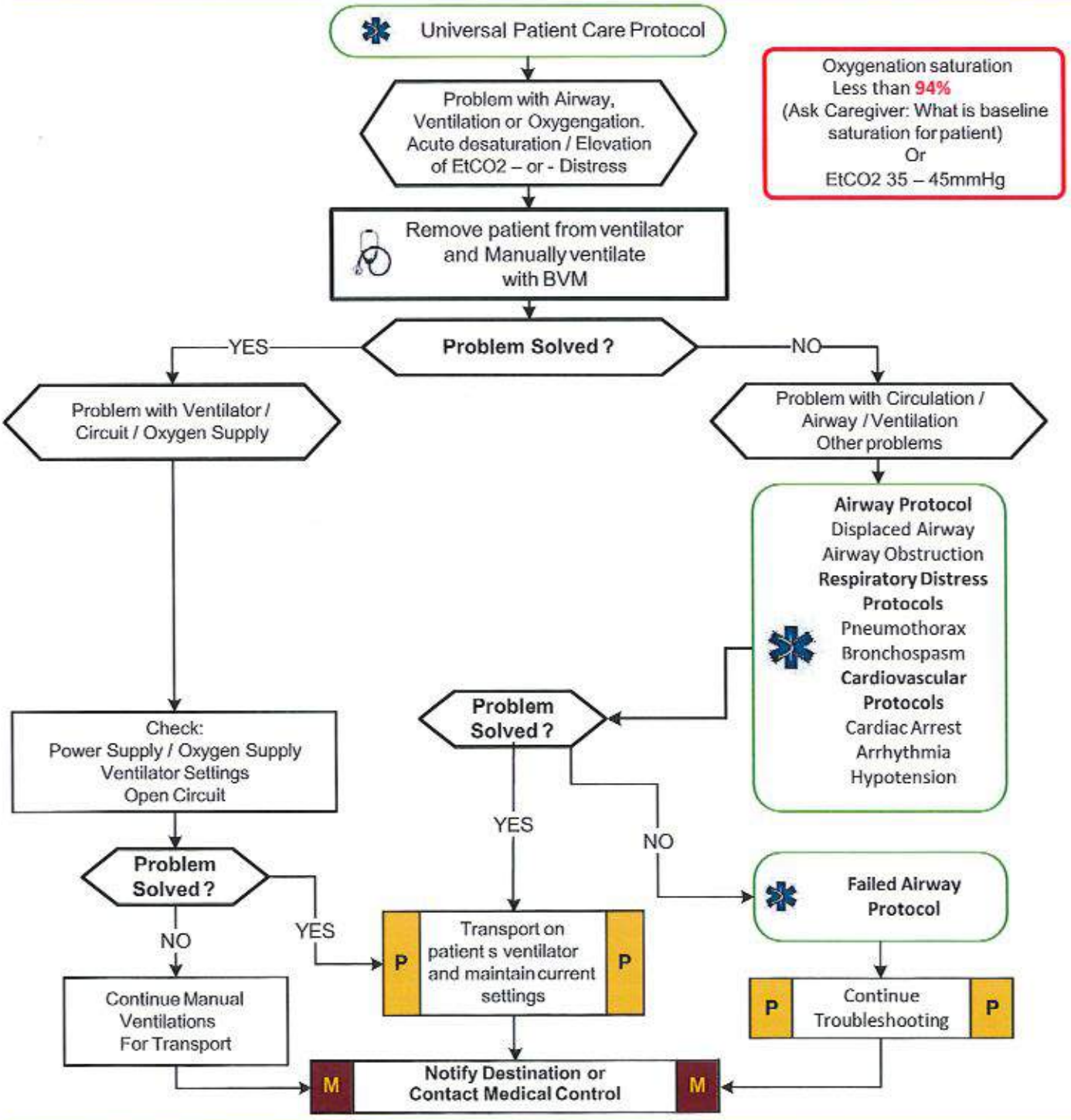
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Use strict sterile technique when manipulating an indwelling catheter.
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- Do not attempt to force catheter open if occlusion evident.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

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



Emergencies Involving Ventilators

Pearls

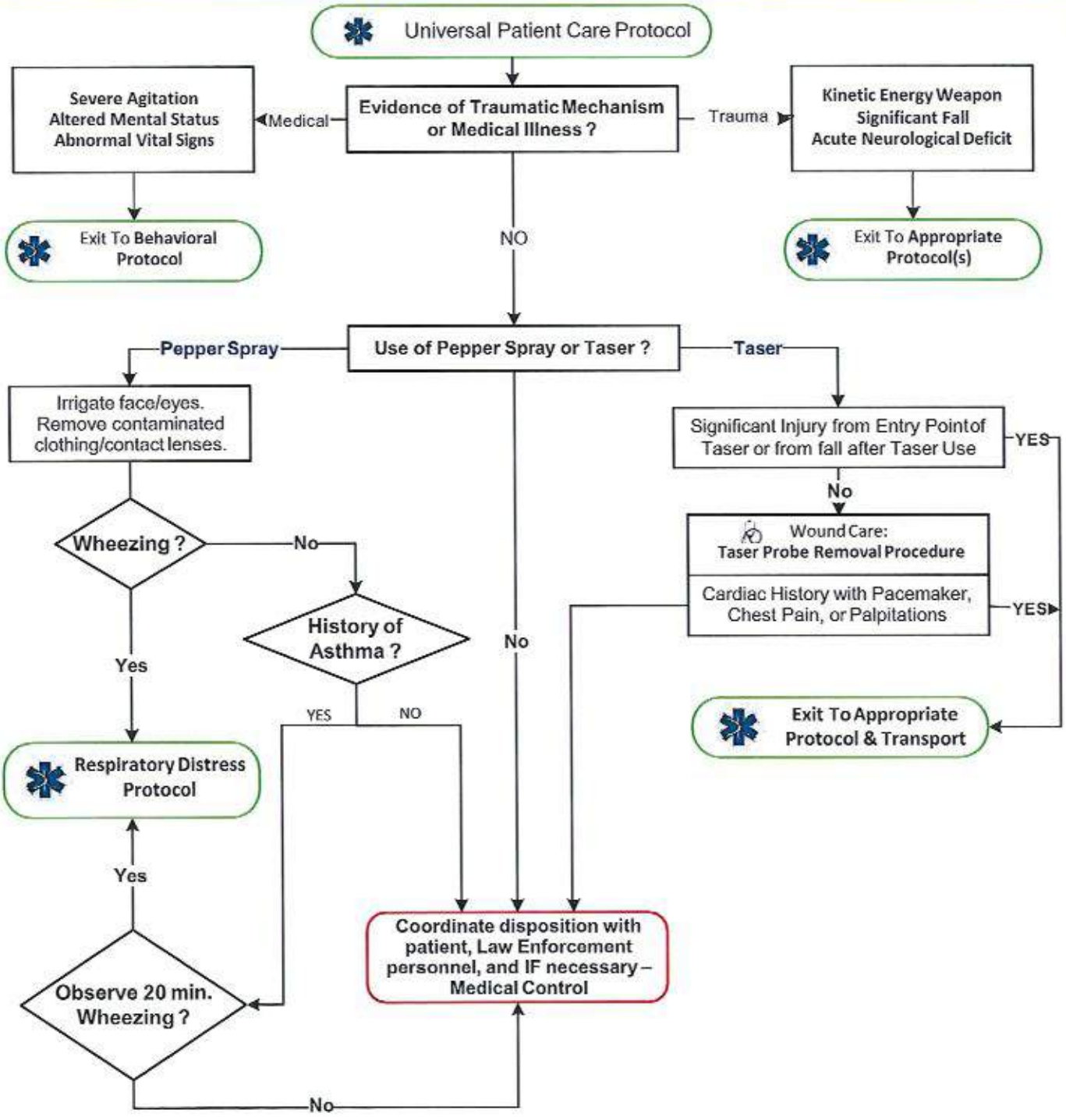
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Always use patient s equipment if available and functioning properly.
- Continuous pulse oximetry and end tidal CO2 monitoring must be utilized during assessment and transport.
- **DOPE:** **D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment 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.

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



Police Custody

Pearls

- **For this protocol to be used, the patient does not have to be under police custody.**
- Agitated delirium is characterized by marked restlessness, irritability, and/or high fever. Patients exhibiting these signs are at high risk for sudden death and should be transported to hospital by ALS personnel.
- Patients restrained by law enforcement devices cannot be transported in the ambulance without a law enforcement officer in the patient compartment who is capable of removing the devices.
- If there is any doubt about the cause of a patient s alteration in mental status, transport the patient to the hospital for evaluation.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately recontact EMS if wheezing/difficulty breathing occurs.
- All patients in police custody retain the right to request transport. This should be coordinated with law enforcement.
- If extremity/chemical/law enforcement restraints are applied, complete Restraint procedure in call reporting system.

Field Triage and Bypass

Assessment of Serious Signs / Symptoms
ABC and LOC

Measure Vital Signs and Level of Consciousness

- Glasgow Coma Scale < 13
- Systolic Blood Pressure < 90 mm Hg
- Respiratory Rate < 10 or > 29 Breaths / min
- Need for Ventilatory Support
- Rate < 20 in infant age < 1 Year

YES → Transport to closest designated trauma center available. Air transport or bypass of Level 3 Trauma Center to Level 1 or Level 2 Trauma Center should be considered if distance and circumstances are appropriate and/or no Level 3 Trauma Center is available

NO

Assess anatomy of injury:

- Penetrating injuries to head, neck, torso or extremity to elbow and knee
- Chest wall instability/deformity (e.g. Flail Chest)
- Crush, de-gloved, mangled or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture
- Paralysis
- Open or depressed skull fracture
- Two or more proximal long bone fractures

YES → Transport to closest designated trauma center available. **A lower level Trauma Center should not be bypassed to transport to a higher level Trauma Center.** If no Trauma Center is available, transport to the closest appropriate hospital Emergency Department for evaluation and transfer as necessary.
Air Transport from incident scene is rarely appropriate

NO

Assess mechanism of injury and evidence of high energy

Falls:
> 20 ft. in adult (one story = 10 feet)
> 10 ft. or two to three times the height of a child
High Risk Auto Crash:
Intrusion including roof: > 12 inches occupant side or > 18 inches any site
Ejection (partial or complete) from automobile
Death in same passenger compartment
Vehicle telemetry data consistent with a high risk of injury
Pedestrian or bicyclist struck by vehicle, thrown, run over, or with impact > 20 MPH
Motorcycle crash > 20 MPH

YES → Transport to closest designated trauma center available. **A lower level Trauma Center should not be bypassed to transport to a higher level Trauma Center.** If no Trauma Center is available, transport to the closest appropriate hospital Emergency Department for evaluation and transfer as necessary.
Air Transport from incident scene is rarely appropriate

NO

Assess special patient or system considerations:

Older Adults:
Risk of injury/death increases > age 55
SBP < may represent shock after age 65
Low impact mechanisms (e.g. ground level falls) may result in severe injury
Children:
Should be triaged preferntially to pediatric capable trauma centres
Pregnancy > 20 weeks
Anticoagulants / bleeding disorders:
Patients with head injury are at high risk for rapid deterioration
Burns:
Without other trauma mechanism: triage to burn facility
With trauma mechanism: triage to trauma center
EMS provider judgment

YES → Transport to closest designated trauma center available. **A lower level Trauma Center should not be bypassed to transport to a higher level Trauma Center.** If no Trauma Center is available, transport to the closest appropriate hospital Emergency Department for evaluation and transfer as necessary.
Air Transport from incident scene is rarely appropriate

NO

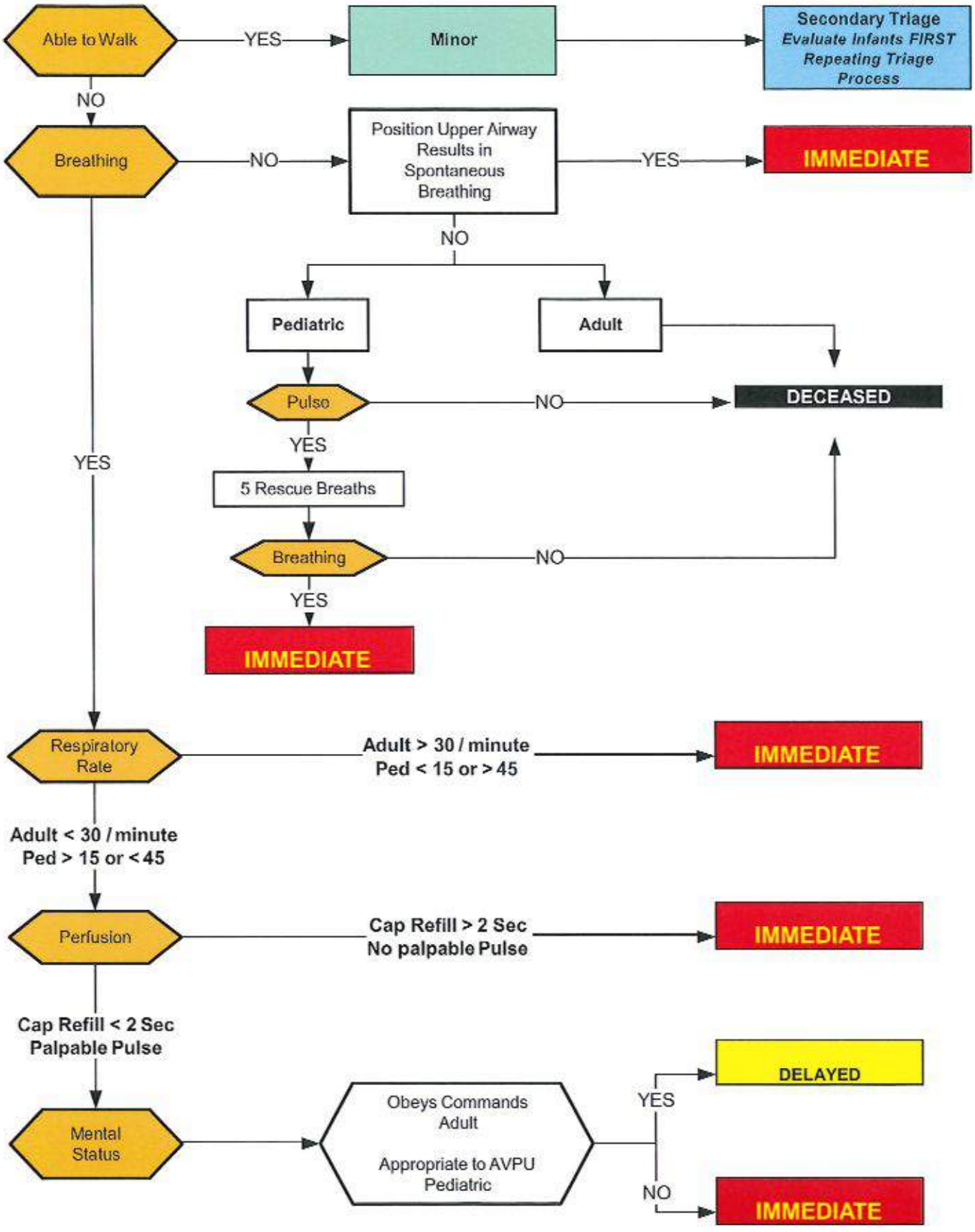
Transport according to usual Transport Protocol

Field Triage and Bypass

Pearls

- **EMS Service *must identify* - in their local protocols - appropriate hospitals when no trauma center is available.**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- 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.
- Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient is the goal.

Mass CasualtyTriage



Mass Casualty Triage

Pearls

- First evaluate all children who did not walk under their on 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.

Anaphylaxis / Allergic Reaction Adult

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

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

Symptom Severity

MILD
Rash, hives, mild wheeze

MODERATE
Wheeze, rapid onset, severe hives / pruritis, Mucuous membrane involvement

SEVERE
Severe wheeze, stridor, dysphonia, dysphagia, hypotension, AMS

B — **Diphenhydramine** PO / IV 25mg
B — **Albuterol** 2.5mg

Improved? NO

Vascular Access Protocol

B — Cardiac Monitor **Acquisition**
P — Cardiac Monitor **Interpretation**
R — Pulse Ox
B — EtCO2

P — **Diphenhydramine** 25-50mg
B — **Albuterol** or other Beta-Agonist 2.5-5mg
P — **Methylprednisolone** 125mg

R — **Epinephrine** 1:1,000 0.3 mg IM Or AutoInjector

YES

Improved ? YES / NO

R — **Epinephrine** 1:1,000 0.3 mg IM

Airway Protocol

Hypotension Protocol

Improved ? YES / NO

Consider:
DiphenhydrAMINE
50mg IV
for dystonic reactions. EPSE can be caused by Geodon, Phenergan, Compazine, Haldol, and Thorazine.

M — **Notify Destination or Contact Medical Control** — M

P / M — **Consider Epinephrine** 1:10,000 Dosage as ordered — P / M

Anaphylaxis / Allergic Reaction

* Anaphylaxis Epinephrine Kit should include the following recommended items:
  - 1 – Tuberculin 1ml syringe
  - 2 – 20-22 gage 1inch- 1 ½ inch needles
  - 2 – Alcohol prep pads
  - 1 - Epinephrine Ampule or Vial 1:1,000 = 1 mg/1 mL

*The Pediatric dosage should match the dose of a Pediatric Epinephrine Auto-Injector (0.15 mg).

*The Adult dosage should match the dose of an Adult Epinephrine Auto-Injector (0.3 mg).

* If Patient has respiratory involvement, consider Albuterol per local Medical Control Option

* See Anaphylaxis Emergency Kit Procedures for further details for EMTs and AEMTs

- Consider **DiphenhydrAMINE 50mg IV** for dystonic reactions. ESP can be caused by Geodon, Phenergan, Compazine, Haldol, and Thorazine.

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 (Severe Symptoms.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrin e infusion. Contact Medical Control for appropriate dosing.**
- Symptom Severity
  Classification: Mild
  symptoms:
  Flushing, hives, itching, erythema with normal blood pressure and perfusion.
  Moderate symptoms:
  Flushing, hives, itching, erythema plus symptomatic respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.
  Severe symptoms:
  Flushing, hives, itching, erythema plus symptomatic 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 onset in -il.**
- **Fluids and Medication titrated to maintain a SBP >70 + (age in years x 2) mmHg.**
- **MR / EMT-B may administer Epinephrine IM and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to MR / EMT-B administering any medication.

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.
- Contact Medical Control prior to administering epinephrine 1:10,000 IV. Use caution 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. These patients should receive a 12lead ECG.

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**

Universal Patient Care Protocol

CONSIDER

B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B

P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

R — **Compress Nostrils**
Ice Packs (if Available)
Tilt Head Forward — R

Transport UPRIGHT Leaning Forward
Unless unstable – then
Transport in LATERAL DECUBITUS Position

Use Protocols as Needed
Airway Protocol
Vascular Access Protocol
Hypertension Protocol
Hypotension Protocol
Dysrhythmia Protocols

P — Consider Anti-Emetics

Adult:
Ondansetron 4mg
Promethazine 12.5mg

Pediatric:
Ondansetron
0.1 mg/kg IV x1; Max: 4 mg
Promethazine - over 2 years of age
0.5mg/kg x1; Max dose 12.5mg
(IM preferred over IV)

P

M — **Notify Destination or Contact Medical Control** — M

Epistaxis

Pearls

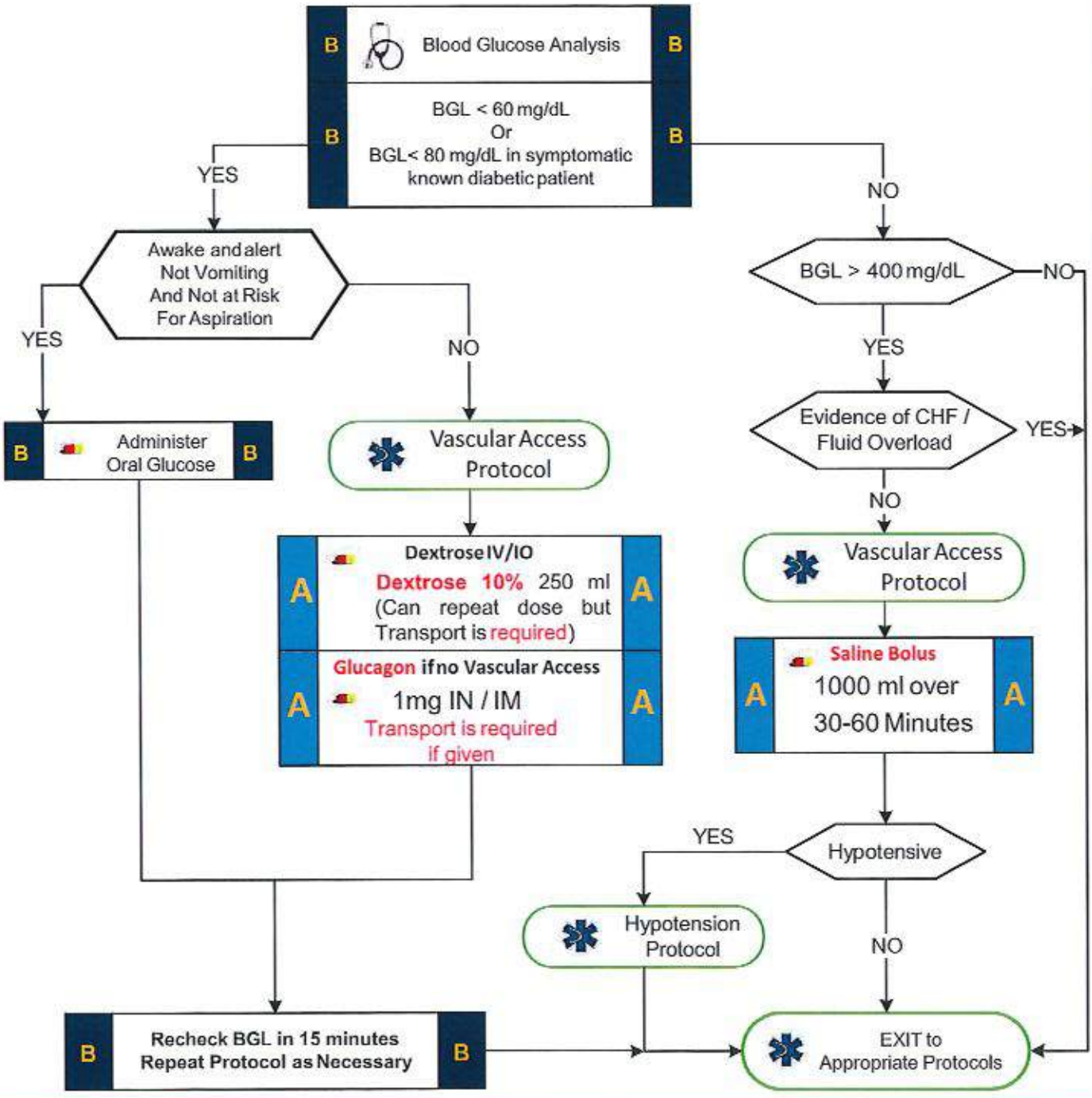
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharnyx.
- Anticoagulants include Aspirin, Coumadin, non-steroidal anti-inflammatory medications (Ibuprofen), and many over the counter headache relief powders.

Glucose Management

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.



Glucose Management

- V 50 mL of D50 = 25 GM Dextrose
- V 100 mL of D25 = 25 GM Dextrose
- V 250 mL of D10 = 25 GM Dextrose
- V 500mL of D5 = 25 GM Dextrose

- ☐Age < 31 days: Dextrose **NO MORE THAN D10**
- ☐Age 31 d -- Y: Dextrose **NO MORE THAN D25**
- ☐Age > 2 Y - Adult: Dextrose Concentration **UP TO D25**
- ☐Age: Adult: Dextrose **D50**

- **In the instance that we administer Dextrose and the patient refuses transport, it is REQUIRED that the Paramedic speak with a member of shift supervision before clearing the scene.**
- **Documentation of the HYPOglycemic patient shall include the results of the dysphagia screen and a Cincinnati prehospital stroke assessment. In addition it is necessary to document the name of the appointed care giver who will be staying with patient for the next 12 hours.**
- **To refuse transport the patient must be FULLY alert and oriented and willing to cooperate with the caregiver. The patient MUST eat in the presence of the crew and their consumption will be documented. The patient MUST NOT have any major underlaying comorbidities.**
- If questions arise contact shift supervision or Medical Control.
- If a second dosage of D10 or D50 is needed it may be repeated once and transport is REQUIRED.
- Glucagon can be administered intranasally and dosage should be divided between nares max of 1ml per nostril.
- Dextrose 50% (D50) 25g IV can still be used at the discretion of the Paramedic.

Pediatric **Dextrose 10%** is 2-4ml per kg

Pediatric **Glucagon**

Less than 8 years-0.5mg and greater than 8 years-1mg IM/IN

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.
- Infiltration of D50 may causes significant pain, swelling, and necrosis of tissues.
- **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.**
- **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.

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)

Adequate Respirations / Oxygenation / Ventilation

NO → R | **NALOXONE** Titrated to effect: Adequate Ventilation and Oxygenation. NOT Given to restore consciousness | R

Yes ↓

Altered Mental Status

Yes → Glucose Mgmt / AMS Behavioral Protocols *If indicated*

NO → B | Cardiac Monitor / 12 Lead ECG **Acquisition** | B
P | Cardiac Monitor / 12 Lead ECG **Interpretation** | P

NO ↓

Age Specific Hypotension

Yes → Age Appropriate Hypotension Protocol *if Indicated*

NO → Vascular Access Protocol

Consider **Nerve Agent Protocol** For Organophosphate poisoning

See below for specific overdose treatments

Call for help / additional resources
Stage until scene safe

M | **Notify Destination or Contact Medical Control** | M

Contact Palmetto Poison Control 1-800-222-1222

Beta Blocker

P	**Glucagon** Adult: 1-2g Pedi: see Broselow Tape	P
P	Consider Pressor: **Dopamine** 2-10 mcg/kg/min Or **Epinephrine** 2-10 mcg/min	P
P	If no improvement consider cardiac pacing	P

Calcium Channel Blocker

P	**Calcium Chloride or Calcium Gluconate** Adult: 1-2g Pedi: see Broselow Tape	P
P	Consider Pressor: **Dopamine** 2-10 mcg/kg/min Or **Epinephrine** 2-10 mcg/min	P
P	If no improvement consider cardiac pacing	P

Opiates

R	**Naloxone** (Nasal Spray) or 0.5-2mg (Initial dose)	R

Stimulants

A	Consider: **Normal Saline Bolus** 20ml/kg	A
P	Consider **Benzodiazepines:** Adult: **Midazolam** 5-10mg **Ziprasidone** 10-20mg Pedi: see Broselow Tape	P

Consider Behavioral Protocol

Tricyclic Antidepressant

Is QRS greater than 0.12 sec?
NO: transport and notify destination
YES: follow below

P	**Sodium Bicarbonate** 1mEq/kg	P

Overdose / Toxic Ingestion

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/KG/MIN	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Epinephrine Drip Chart

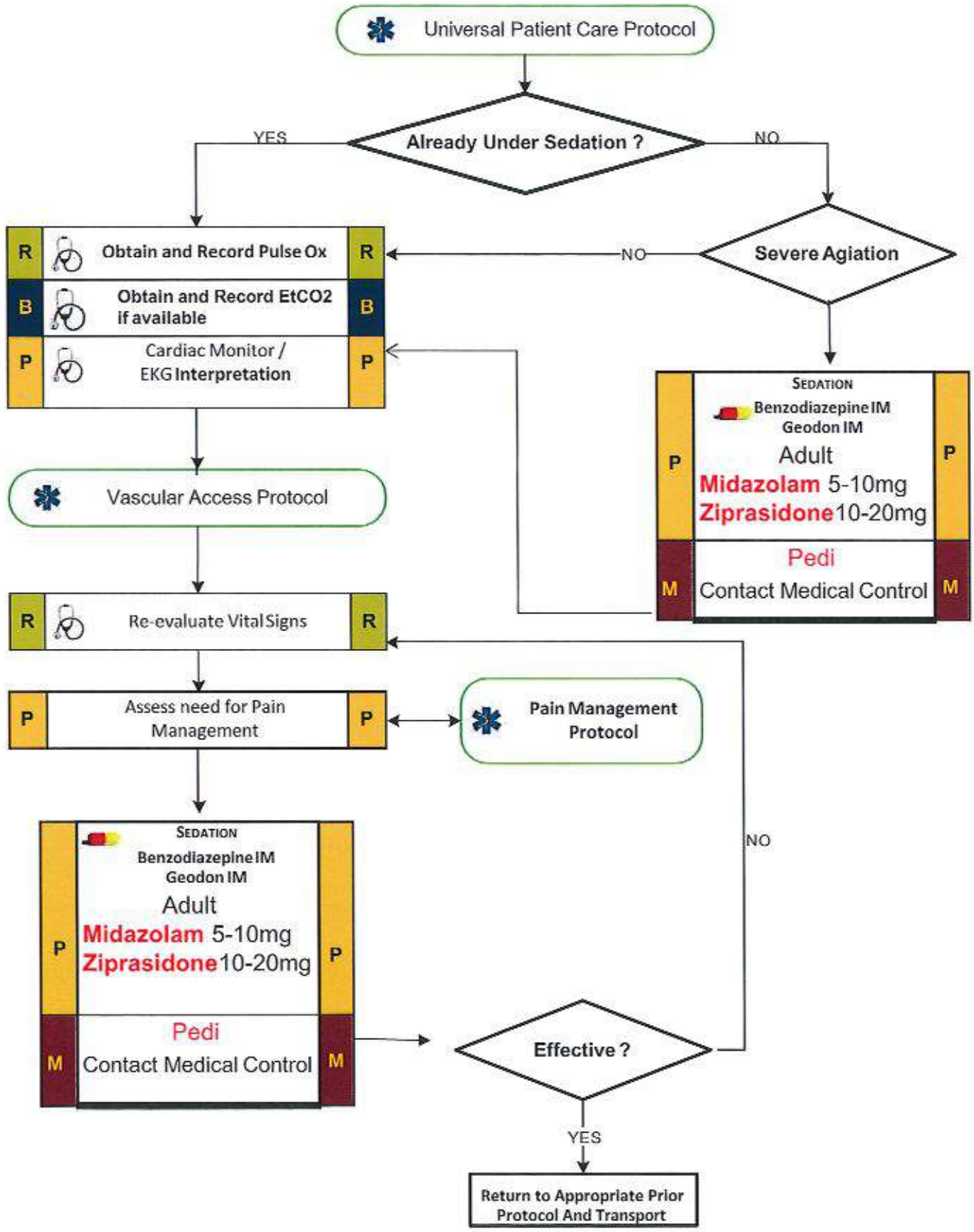
Ensure you have 8mcg/ml Concentration for this chart - Mix 2mg Epi 1:1,00 in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/MIN	gtts/min
2 mcg	15
4 mcg	30
6 mcg	45
8 mcg	60
10 mcg	75

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.
- **MR and EMT-B may administer naloxone by IN route only and may administer from EMS supply. Agency medical director may require Contact of Medical Control prior to administration and may restrict locally.**
- **When appropriate contact the Palmetto Poison Control Center for guidance.**

Sedation


Universal Patient Care Protocol
Already Under Sedation ?
YES
NO
Severe Agiation
NO
R
Obtain and Record Pulse Ox
R
B
Obtain and Record EtCO2 if available
B
P
Cardiac Monitor / EKG Interpretation
P
SEDATION
Benzodiazepine IM
Geodon IM
Adult
Midazolam 5-10mg
Ziprasidone 10-20mg
Pedi
Contact Medical Control
P
M
Vascular Access Protocol
Re-evaluate Vital Signs
Assess need for Pain Management
Pain Management Protocol
NO
Effective ?
YES
Return to Appropriate Prior Protocol And Transport

Sedation

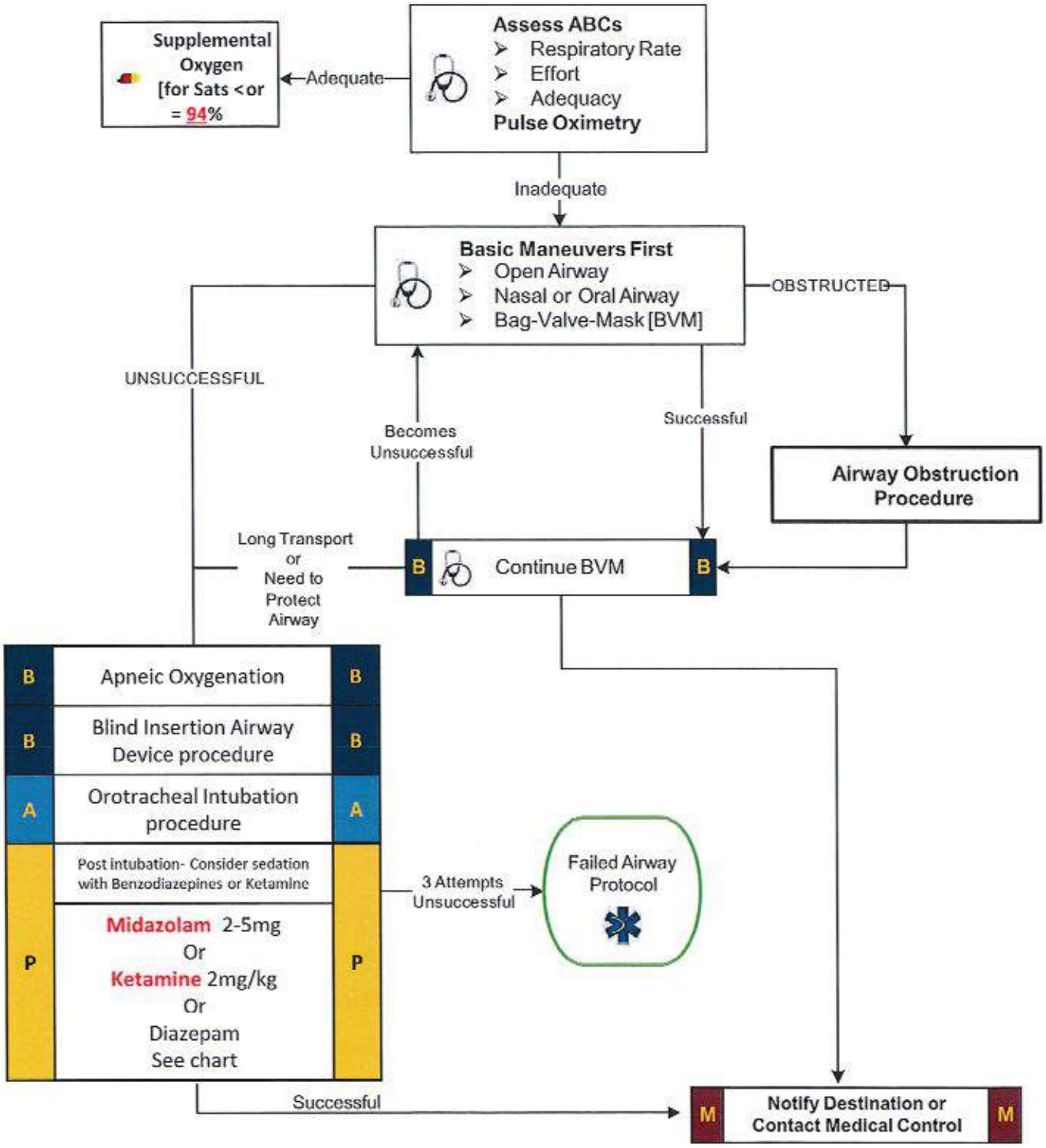
- **Ziprasidone should be reconstituted with 1.2ml sterile water prior to IM injection**

Pearls

- **Sedation initiated prior to Online Medical Control Contact requires 100% QA review by the Medical Control Physician and/or an appropriately designated surrogate.**

- Your safety always comes first! If patient is fighting back away and call for law enforcement, do not actively fight patient.
- Consider Ziprasidone for patients with history of psychosis.
- Any patient that is handcuffed or restrained by law enforcement and transported by EMS must be accompanied by law enforcement in the patient compartment.
- Do not position or transport any restrained patient in such a way that could impact the patients respiratory or circulatory status.
- **All patients who receive either physical or chemical restraint should be continuously monitored by ALS personnel immediately upon arrival on scene and throughout the patient contact.**

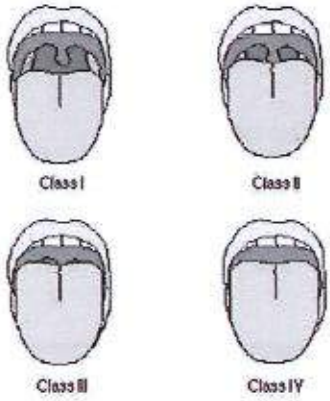
Airway, Adult



Airway, Adult

Mallampati

The system takes into account the anatomy of the mouth and the view of various anatomical structures when the patient opens his mouth as wide as possible. This test is performed with the patient in t he sitting position, the head held in a neutral position, the mouth wide open, and the tongue protruding to the maximum.



Class (easy) = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.
Class I = visualization of the soft palate, fauces and uvula.
Class III = visualization of the soft palate and the base of the uvula.
Class V (difficult) = soft palate is not visible at all.

- If first intubation attempt fails, make an adjustment and then consider:
  - Different laryngoscope blade
  - Gum Elastic Bougie
  - Different ETT size
  - Change cricoid pressure
  - 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.

Pearls

- **This protocol is only for use in ADULT patients.**
- **Capnometry (Color) or capnography is mandatory with all methods of intubation. Document results.**
- **Capnography is:**
  - **Required for ALL Intubated Patients, Advanced Airway Device (i.e BIAD), and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of >94% , it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol an adequate airway is when the patient is receiving appropriate oxygenation and ventilation – and not at an undue risk of aspiration or deterioration**
- **An Intubation Attempt is defined as passing an endotracheal tube past the teeth**
- **Ventilatory rate should be sufficient 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.**
- Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- Maintain C-spine motion restriction for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic - use oxygen, not a paper bag.
- BURP maneuver may be used to assist with difficult intubations.
- 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.
- It is important to secure the endotracheal tube well and consider c-collar to better maintain ETT placement.

Airway, Adult - Failed

A failed airway is defined as Two (2) failed intubation attempts by most proficient technician on scene or anatomy inconsistent with intubation attempts.

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Inability to Oxygenate due to Upper Airway Compromise

NO → R Routine Airway Management and Transport R

YES ↓

Inability to Oxygenate with BVM Oral / Nasopharyngeal Airway

NO → R BVM Ventilation R

YES ↓

R Call For Assistance R

↓

B Initiate Apneic Oxygenation B

↓

Inability to Intubate Oral Reposition, consider equipment change, BURP, bougie, Alternate Provider

NO → P ET Intubation and Transport P

YES ↓

Inability to Oxygenate with BIAD

NO → B BIAD and Transport B

YES ↓

R  BVM Ventilation R → Emergent Transport

↓

M Notify Destination or Contact Medical Control M

Airway, Adult - Failed

Think DOPE

Displacement

Obstruction

Pneumothorax

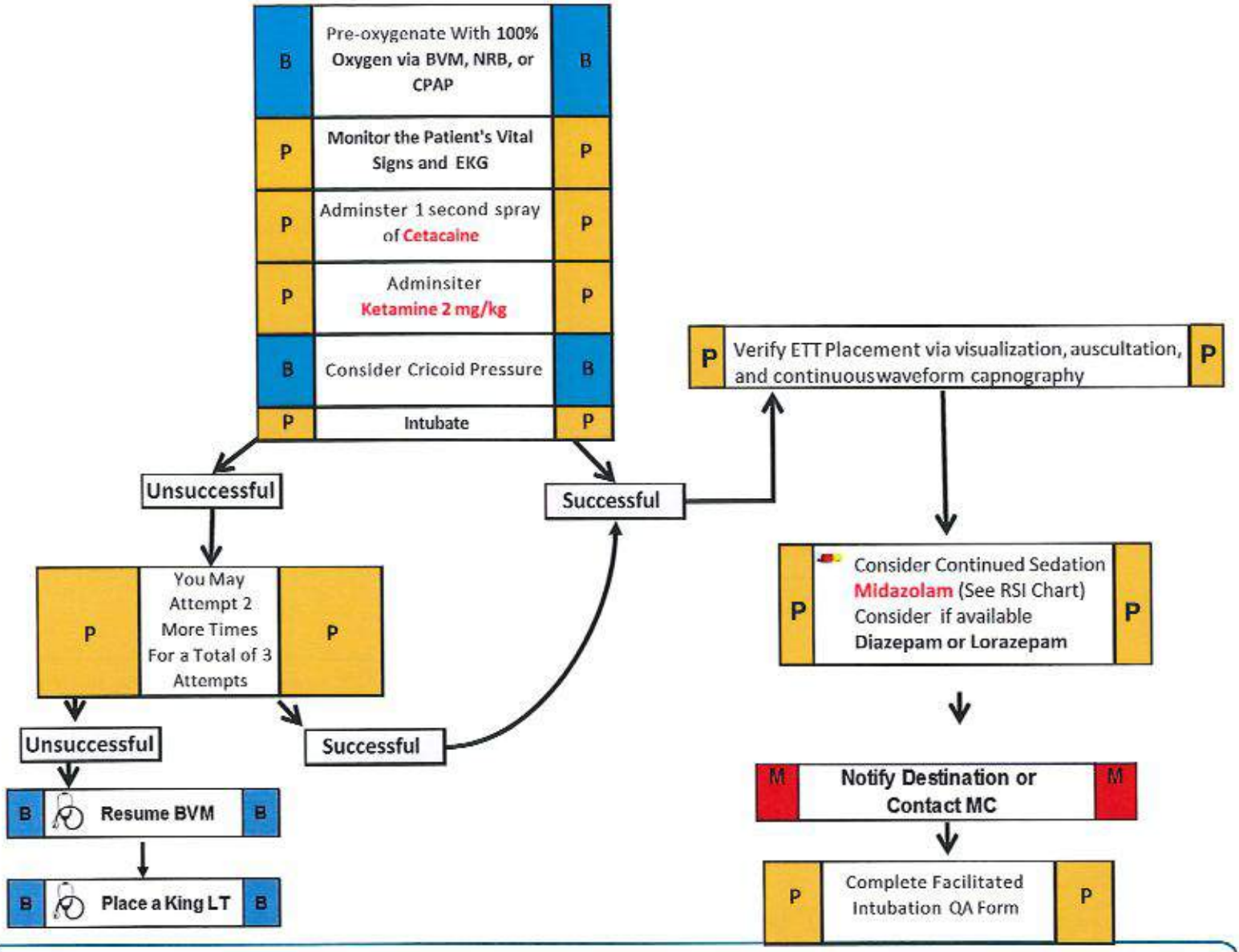
Equipment Failure

Pearls

- **Capnography is:**
  - **Required for ALL Intubated Patients, Advanced Airway Device (i.e BIAD), and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- Notify **Medical Control** **AS EARLY AS POSSIBLE** about the patient's difficult / failed airway.

**ONLY RSI QUALIFIED PARAMEDICS MAY PERFORM THIS SKILL **

Pharmacologically Assisted Intubation



Pearls

- **Remember that PAI is for patients that do not require paralysis. This should not take the place of or**
- **supersede RSI**
- **ANTICIPATE THE NEED FOR RSI EARLY ON IN THE CALL and request the appropriate assistance.**
- **This protocol is only for use in patients with an Age ≥12 years old and ≥ 55kg**
- **Continuous capnography (EtCO2) must be utilized 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 > 94, it is preferred**
- **to continue with basic airway measures instead of utilizing a BIAD or Intubation.**
- **** Reminder ** an adequate airway is achieved when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as passing the endotracheal tube past the teeth.**
- **Ventilatory rate should be 10-12 per minute to maintain a EtCO2 of 35-45. Avoid hyperventilation.**
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Sellick's maneuver (cricoid pressure) can be used to assist with difficult intubations.
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO2 of 30-35.
- It is important to adequately secure the endotracheal tube with commercial device and utilize a c-collar to better maintain tube
- placement.

****ONLY RSI QUALIFIED PARAMEDICS MAY PERFORM THIS SKILL ****

Rapid Sequence Intubation 1/2

Consider passive oxygenation via NRB at 15 lpm

B	Pre-oxygenate With **100% Oxygen via Mask,BVM, or CPAP** if Possible	B
B	Monitor Oxygen Saturations	B
A	Ensure You Have Patent IV/IO Access	A
P	Monitor the Patient's EKG	P
P	**Etomidate (See Chart)**	P
P	Apply the Sellick's Maneuver (Cricoid Pressure)	P
P	After 1 Minute Administer **Succinylcholine** (See Chart)	P
P	**Intubate**	P

RSI Steps By Time
(T=Time)(- Minus)(+Plus) Minutes

T-4	**Preoxygenate** via NRB or BVM 100% O2
T-2	**Etomidate**
T-1	**Atropine** if needed for bradycardia
T-0	**Succinylcholine**
T+1	Intubate

Unsuccessful

DO NOT RELEASE CRICOID PRESSURE

P | You May Attempt 2 More Times For a Total of 3 Attempts | P

Unsuccessful

B | Place a KingLT | B

Successful

Successful

P | Verify ETT Placement via visualization, auscultation, and continuous waveform capnography

P | Consider Continued Sedation **Midazolam** (See Chart) Consider if available **Diazepam or Lorazepam** | P

P | If Continued Agitation Exists Consider a Long Acting Paralytic **Vecuronium** (See Chart) or **Rocuronium** (See Chart)

Indications

- Age ≥ 12 years old and ≥ 55kg
- Trauma with GCS ≤8 with gag reflex
- Trauma with significant facial trauma and poor airway control
- Closed head injury or major stroke with unconsciousness
- Acute burn with airway involvement and inevitable airway loss
- Respiratory exhaustion such as severe asthma, CHF or COPD with hypoxia
- Overdose with AMS where loss of airway is inevitable

Considerations

- A Thorough Exam is Mandatory Prior To Performing This Skill.
- You may consider **Midazolam 2.5-5mg** in place of **Etomidate** if you suspect sepsis.
- Remember (2) paramedics must be on Scene to perform this skill. (1) must be RSI Qualified.

Contraindications

- *Age less than 12*
- Significant burns between 24 hours old and 2 weeks old
- Known neuromuscular disease such as myasthenia gravis, amyotrophic lateral sclerosis, muscular dystrophy, Guillain-Barre Renal failure patients who have not had hemodialysis within the past 24 hours
- Known hyperkalemia
- Patient or family history of malignant hyperthermia.
- Inability to get a mask seal.

Drug Assisted Intubation
Airway RSI

RSI Weight Based Criteria	
< 100 lbs.	< 45kg
100-200 lbs.	45-91kg
Over 200 lbs	>91kg

Paralytic	
Vecuronium Maximum dose 10 mg (10 mL)	
5 mg	5 ml
8 mg	8 ml
10 mg	10 ml

Sedative		Paralytic		Paralytic	
Etomidate (Amidate) Max Dose 30mg (15ml)		**Succinylcholine** (Anectine) Max Dose 150mg (7.5ml)		**Rocuronium** (Zemuron) Max Dose 100mg (10ml)	
15mg	7.5ml	75mg	3.75ml	50mg	5ml
20mg	10ml	150mg	7.5ml	80mg	8ml
30mg	15ml	150mg	7.5ml	100mg	10ml

Sedative		Sedative		Sedative	
Midazolam (Versed) Max Dose 5mg (5ml)		**Diazepam** (Valium) Max Dose 10mg (2ml)		**Lorazepam** (Ativan) Max Dose 4mg (2ml)	
2.5mg	0.5ml	5mg	1ml	2mg	1ml
5mg	1ml	10mg	2ml	4mg	2ml
5mg	1ml	10mg	2ml	4mg	2ml

3-3-2 Rule for Difficult Airway Evaluation

Respiratory Distress

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.)**

Universal Patient Care Protocol

Respiratory / Ventilatory Insufficiency?
If available measure EtCO2
Consider Airway Compromise or Foreign Body

YES → Go To Airway Protocol

NO

Rales or Signs of CHF ?

YES → Pulmonary Edema Protocol

NO

Position Patient for Comfort

Vascular Access Protocol

Wheezing

B	**Albuterol** 2.5mg-5mg
A	Repeat **Albuterol** or other **Beta-Agonist**
P	Repeat **Albuterol** or other **Beta-Agonist** with **Ipratropium** if Available 0.5 mg ipratropium bromide+ 2.5 mg albuterol sulfate

B	Consider **BIPAP / CPAP**
P	Consider **Epinephrine** 1:1,000 **0.3mg IM**

Stridor

B	**Normal Saline Nebulized**
P	If No Improvement or Severe **Racemic Epinephrine Nebulized** 0.5-0.75ml of 2.25% solution in 2.0ml normal saline

M	**If No Improvement Contact Medical Control**

OLMC

Consider Anaphylaxis Protocol

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**
- **EMT administration of Beta-Agonists (e.g., Albuterol) is restricted to patients who are under doctor's orders with a prescription for the drug.**
- **Pulse oximetry** should be monitored continuously if initial saturation is < or = 94%, or there is a decline in patients status despite normal pulse oximetry readings.
- **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.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **Capnography is:**
  - **Required for ALL Intubated Patients, Advanced Airway Device (i.e B*IAD)**
  - **Recommended / Encouraged for all unstable patients**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**

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

If Tracheostomy Tube unable to be Cleared and Patient is in extremis – Remove Tracheostomy Tube.
EMERGENT SUCTIONING of Tracheostomy Tube may be performed by ALL Levels (when patient is unable to breathe adequately).

Universal Patient Care Protocol

Tracheostomy Tube in place — NO → Tracheostomy Tube available — YES → **Allow *Caregiver* to insert Tracheostomy Tube - OR -**: P — Place Tracheostomy Tube /Appropriately sized ETT into stoma — P

Tracheostomy Tube in place — YES → Obturator Removed — NO → A — Remove Obturator — A

Tracheostomy Tube available — NO → **Continued Respiratory Distress?**

Obturator Removed — YES → Inner Cannula in place (Double lumen) — YES → A — Remove Inner Cannula — A; R — Suction Tracheostomy Tube — R

Inner Cannula in place (Double lumen) — NO → Speaking Valve Decannulation plug Removed — NO → A — Remove Speaking Valve Remove Decannulation plug — A; R — Suction Tracheostomy Tube — R

Speaking Valve Decannulation plug Removed — YES → R — Suction Tracheostomy Tube — R

Continued Respiratory Distress? — YES → R — Suction Tracheostomy Tube — R

Continued Respiratory Distress? — NO → Monitor & Reassess

Continued Respiratory Distress — YES → R — Assist Ventilations via Tracheostomy Tube Or ETT — R → Exit to Age Appropriate Respiratory Distress Protocol(s)

Continued Respiratory Distress — NO → Monitor & Reassess

M — **Notify Destination or Contact Medical Control** — M

Respiratory Distress With a Tracheostomy Tube

Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **If Tracheostomy Tube unable to be Cleared and Patient is in extremis – Remove Tracheostomy Tube.**
- **EMERGENT SUCTIONING of Tracheostomy Tube may be performed by ALL Levels (when patient is unable to breathe adequately).**
- 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 2–3mL 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:** **D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Asystole
Pulseless Electrical Activity

HISTORY
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
  - Tricyclics
  - Digitalis
  - Beta blockers
  - Calcium channel blockers
- DNR form

Signs and Symptoms
- Pulseless
- Apneic
- Electrical activity on ECG
- No heart tones on auscultation

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

The focus is on **QUALITY** CPR until more than 2 responders are on scene

Airway Management

When there are only 2 rescuers provide Oxygen via NRB @ 15lpm. Once additional recourses arrive begin BVM ventilations

Our advanced airway device for medical cardiac arrest patients will be BIAD unless otherwise contraindicated.

Cardiac Arrest Protocol

R — CPR — R

Airway Protocol

Vascular Access Protocol

P	**Epinephrine** every 3 – mins 1 mg of 1:10,000	P
A	**Normal Saline Bolus** 20cc/kg	A
B	**Assess Blood Glucose**	B
P	Consider **Naloxone**[1] 0.5mg -10 mg	P
P	Consider **Glucagon**[2] 1-2 mg	P
P	Consider **Calcium Gluconate**[3] 1-2 g	P
P	Consider **Bicarbonate**[4] 1meq/kg	P
P	Consider **Dopamine Infusion** 2-10 mcg/kg/min	P
P	Consider **Chest Decompression**[5]	P
P	Consider **Atropine** (Rate < 60) If ROSC occurs 0.5mg	P
P	**Consider External Pacing** If ROSC occurs	P
P	Consider **Epinephrine Infusion** 2-10mcg/min	P

25 MINUTES

We will work cardiac arrest patients wherever they are unless there is a safety issue.

We will provide high quality resuscitation for 25 minutes prior to making transport decisions.

AT ANY TIME

Return of Spontaneous Circulation

↓

Go to Post Resuscitation Protocol

1. Consider Naloxone for suspected opioid overdose.
2. Glucagon for suspected Beta Blocker or Calcium Channel Blocker Overdose.
3. Calcium for suspected Calcium Channel Blocker etiology or Hyperkalemia
4. Bicarbonate for Tricyclic Overdose, Hyperkalemia, Renal Failure
5. Consider Chest Decompression for Tension Pneumothorax

Criteria for Discontinuation

YES → **STOP Resuscitation**

NO → M **Notify Destination or Contact Medical Control** M

Asystole
Pulseless Electrical Activity

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
MCG/KG/MIN 2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
MCG/KG/MIN 5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
MCG/KG/MIN 10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
MCG/KG/MIN 15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
MCG/KG/MIN 20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Epinephrine Drip Chart

Ensure you have 8mcg/ml Concentration for this chart - Mix 2mg Epi 1:1,00 in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

	gtts/min
MCG/MIN 2 mcg	15
MCG/MIN 4 mcg	30
MCG/MIN 6 mcg	45
MCG/MIN 8 mcg	60
MCG/MIN 10 mcg	75

Pearls

- **Recommended Exam: Mental Status**
- Consider each possible cause listed in the differential: Survival is based on identifying and correcting the cause!
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Atrial Fibrillation
Supraventricular Tachycardia

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

Signs and Symptoms
- **Sustained** HR > 150/Min
- **QRS < .12 Sec (if QRS >.12 sec, go to V-Tach Protocol**
- **If history of WPW, go to V-tach Protocol**
- Dizziness, CP, SOB
- Potential presenting rhythm
  - Atrial/Sinus tachycardia
  - Atrial fibrillation / flutter
  - Multifocal atrial 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**

Universal Patient Care Protocol

Vascular Access Protocol

B | Cardiac Monitor / 12 Lead EKG **Acquisition** | B

P | Cardiac Monitor / EKG **Interpretation** | P

*** If patient is unstable and /or vascular access is problematic – initial therapy with synchronized electrical cardioversion is warranted**

STABLE

Rhythm Regular

YES

P | May attempt **Valsalva or other Vagal Maneuver** initially and after each drug administration if indicated | P

P | **Adenosine** 1st dosage 6 mg 2nd Dosage 12 mg Max of 18 mg | P

NO

PERSISTENT Tachydysrhythmia

Unstable/Altered Mental Status *

P | Consider **Benzodiazepines** Midazolam (Versed) 1mg- 2mg | P

P | **Synchronized Cardioversion** Narrow Regular 100j - 200j - 300j - 360j | P

P | **Synchronized Cardioversion** Narrow Irregular 200j - 300j - 360j | P

If Rhythm Changes Exit to Appropriate Protocol

P | Consider **Diltiazem** 20mg given over 10 min | P

P | Consider **Metoprolol** 5mg slow IV push may repeat 1x | P

B | Repeat 12 Lead EKG **Acquisition** | B

M | **Notify Destination or Contact Medical Control** | M

Atrial Fibrillation
Supraventricular Tachycardia

- Diltiazem 20mg into 100ml bag using 10gtt set. Administer over 10 minutes.
- May Repeat once dosage is 25mg.
- **DO NOT** perform carotid massage for vagal maneuver.

Pearls

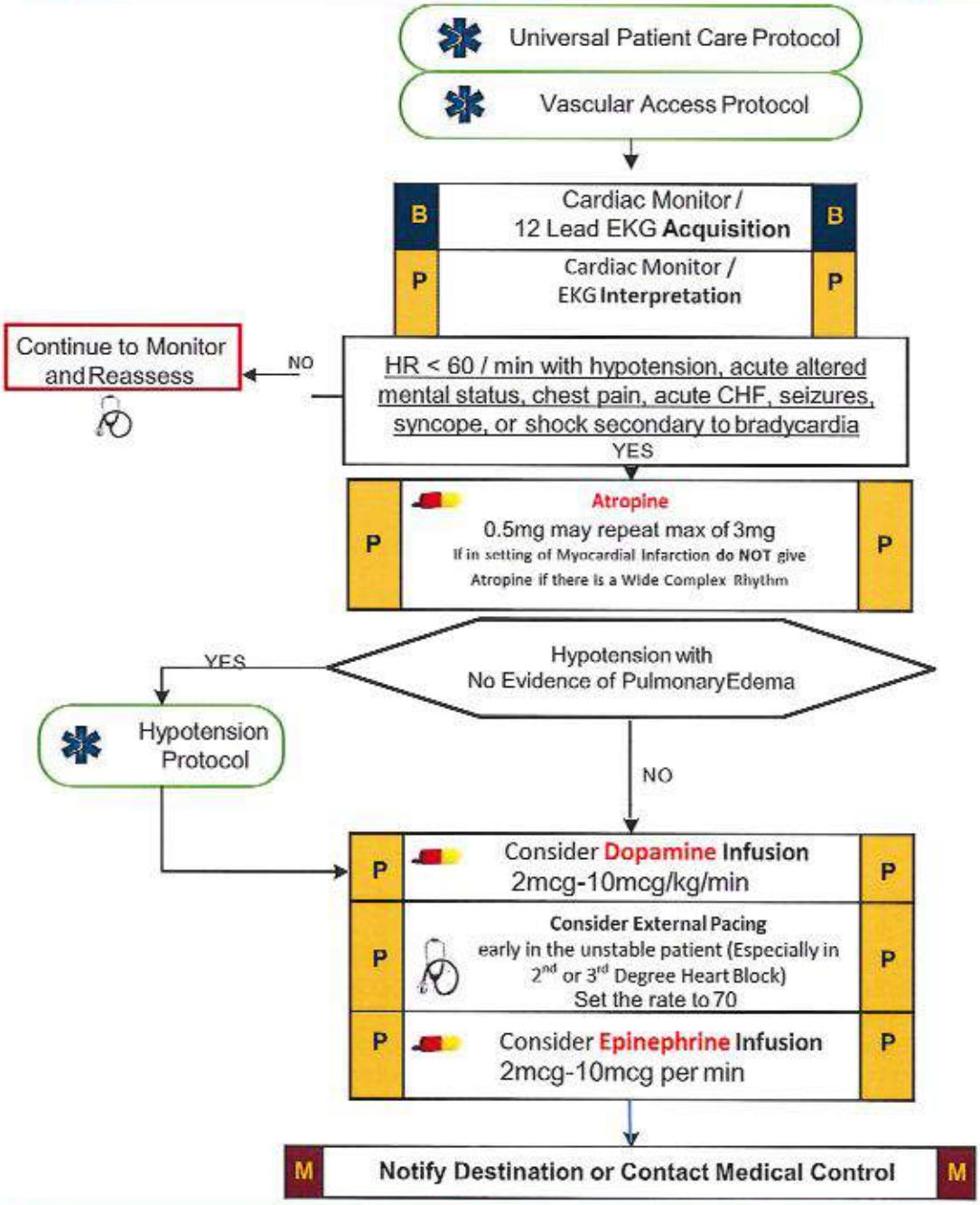
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers.
- Calcium Channel Blocker administered **ONLY** with Narrow Complex Tachydysrhythmia.
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, yet is not harmful.
- Monitor for hypotension after administration of Calcium Channel Blocker 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.

Bradycardia

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

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

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Epinephrine Drip Chart

Ensure you have 8mcg/ml Concentration for this chart - Mix 2mg Epi 1:1,00 in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

	gtts/min
MCG/MIN 2 mcg	15
MCG/MIN 4 mcg	30
MCG/MIN 6 mcg	45
MCG/MIN 8 mcg	60
MCG/MIN 10 mcg	75

Consider:

- Glucagon- 1mg if patient still bradycardic and on beta blockers
- Calcium Gluconate- 1-2g if patient still bradycardic and on calcium channel blockers

Pearls

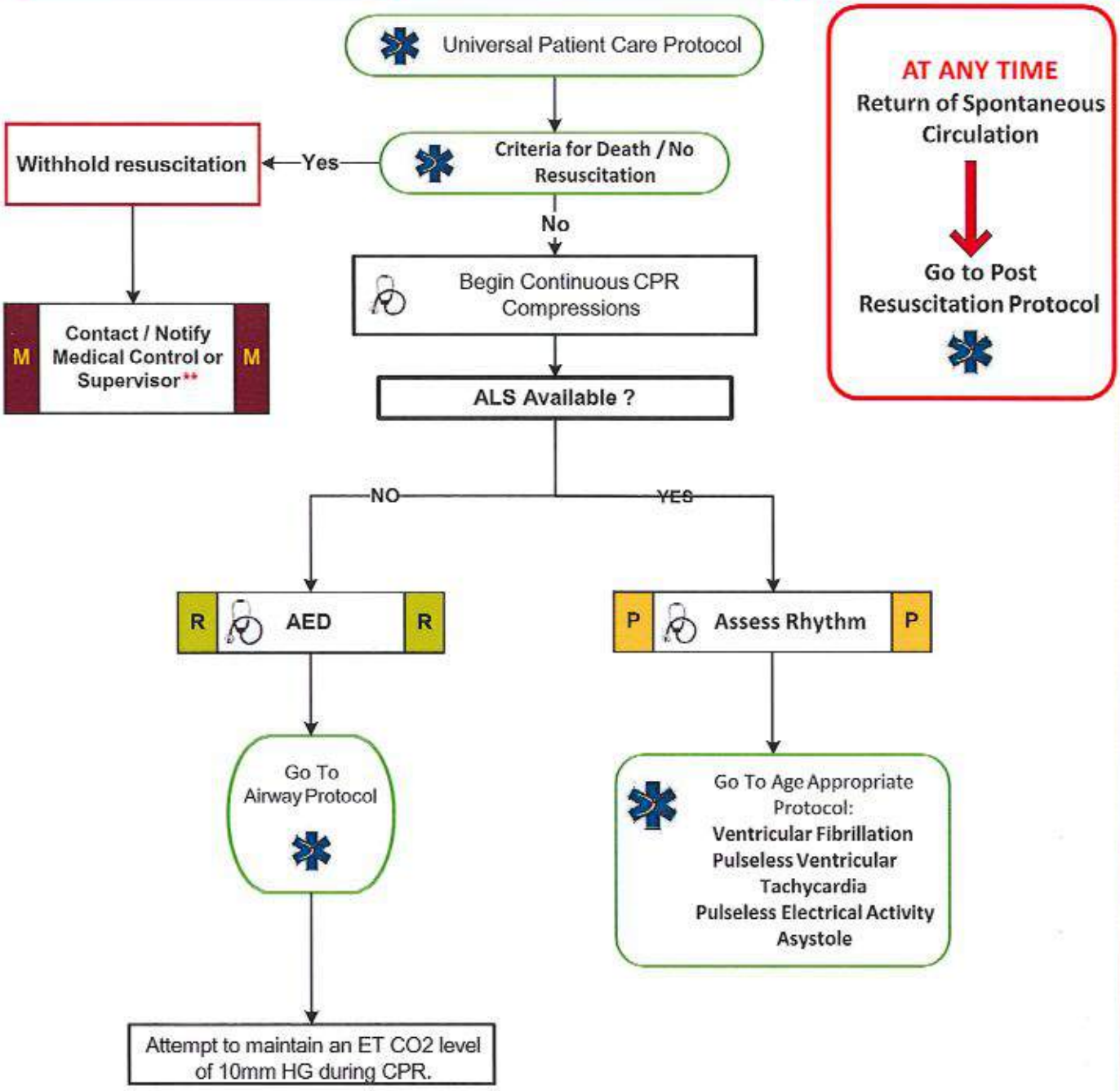
- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- The use of Lidocaine, Beta Blockers, and Calcium Channel Blockers in heart block can worsen Bradycardia and lead to asystole and death.
- Pharmacological treatment of Bradycardia is based upon the presence or absence of symptoms. **If symptomatic treat, if asymptomatic, monitor only.**
- In wide complex slow rhythm consider hyperkalemia.
- Remember: The use of Atropine for PVCs in the presence of a MI may worsen heart damage.
- If vascular access is problematic and the patient is symptomatic, initial therapy with external pacing may be warranted.
- Consider treatable causes for Bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)

Cardiac Arrest

History:
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Signs of lividity, rigor mortis
- DNR form

Signs and Symptoms:
- Unresponsive
- Apneic
- Pulseless

Differential:
- **Medical vs Trauma**
- **V. fib vs Pulseless V. tach**
- **Asystole**
- **Pulseless electrical activity (PEA)**



Cardiac Arrest

H's of ACLS

Causes	Signs	Treatment
Hypovolemia	-Rapid heart rate -Narrow QRS -Blood loss	-Obtain IO/IV Access -Administer fluid/blood -Use fluid challenge
Hypoxia/ Hypoxemia	-Slow heart rate -Cyanosis	-Ensure airway is open -Ventilate -Ensure oxygen supply is adequate
Hydrogen Ion Excess (Acidosis)	-Low amplitude QRS complex	-Atrial blood gas -Provide adequate ventilations -Sodium bicarbonate (metabolic)
Hypokalemia/ Hyperkalemia	-Flattened T waves & a U wave (Hypokalemia) -Peaked T waves & a widened QRS (Hyperkalemia)	-Ventilate (respiratory) -Sodium bicarbonate (metabolic)
Hypothermia	-Shivering -Previous exposure to cold temperatures	-Active warming measures -Temperature should be above 30°C

T's of ACLS

Causes	Signs	Treatment
Tamponade (Cardiac)	-Rapid heart rate -Narrow QRS -JVD -No pulse -Muffled heart sounds	-Pericardiocentesis -Thoracotomy
Toxins	-Prolonged QT interval	-Based on overdose agent -Supportive care
Tension Pneumothorax	-Slow heart rate -Narrow QRS -Unequal breathing -JVD -Tracheal deviation	-Needle decompression -Insertion of a chest tube
Thrombosis (Pulmonary)	-Rapid heart rate -Narrow QRS -Shortness of breath -Decreased oxygen -Chest pain	-Embolectomy -Fibrinolytic therapy -Anticoagulant therapy
Thrombosis (Coronary)	-Abnormal ECG	-Angioplasty -Stent placement -Coronary bypass surgery

Pearls

- **Recommended Exam: Mental Status**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Reassess airway frequently and with every patient move.
- **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport.
- **High quality compressions with timely defibrillation are the keys to success.**

Chest Pain: Cardiac and STEMI

History
- Age
- Medications
- **Erectile Dysfunction Medication**
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies (Aspirin, Morphine, Lidocaine)
- Recent physical exertion
- **P**alliation / **P**rovocation
- **Q**uality (crampy, constant, sharp, dull, etc.)
- **R**egion / **R**adiation / **R**eferred
- **S**everity (1-10)
- **T**ime (onset /duration /repetition)

Signs and Symptoms
- CP (pain, pressure, aching, vicelike 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**

Universal Patient Care Protocol

B Cardiac Monitor / 12 Lead EKG **Acquisition** B

P Cardiac Monitor / EKG **Interpretation** P

Positive Acute MI (STEMI = 1 mm ST Segment Elevation in 2 Contiguous Leads

Vascular Access Protocol

Transport based on EMS System STEMI Plan With Early Notification Keep Scene Time to < 15 minutes

B **Aspirin** (Unless Allergy) 324mg B

B **Nitroglycerin SL** 0.4mg Q every 5 minutes B

P Consider **Nitroglycerin Paste** 1" of paste P

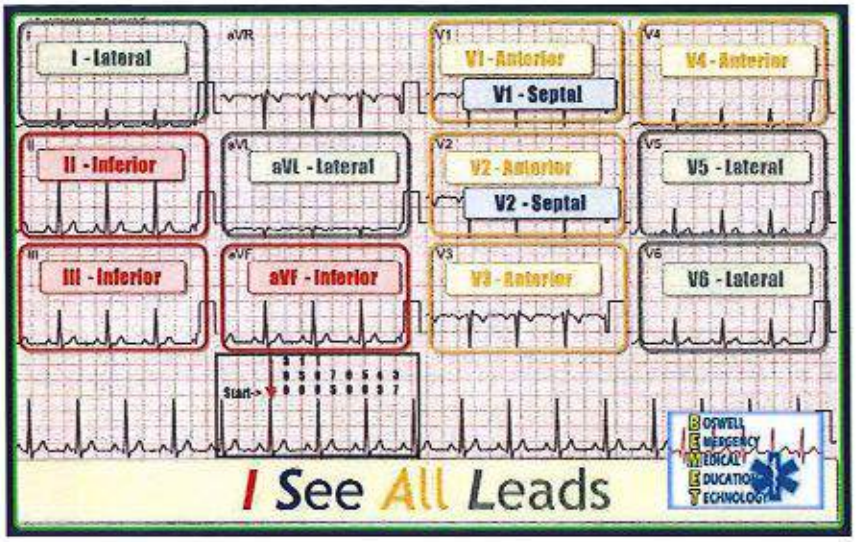
Continued Pain: **Pain Control Protocol** (per Local Medical Control)

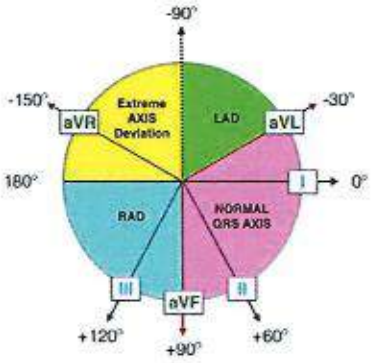
P Consider **Anti-Emetics** for Nausea/Vomiting
Ondansetron 4mg
(may repeat once)
Promethazine 12.5mg P

Go To Appropriate Protocol:
Hypotension Protocol
Dysrhythmia Protocols

M Notify Destination or Contact Medical Control M

Chest Pain: Cardiac and STEMI





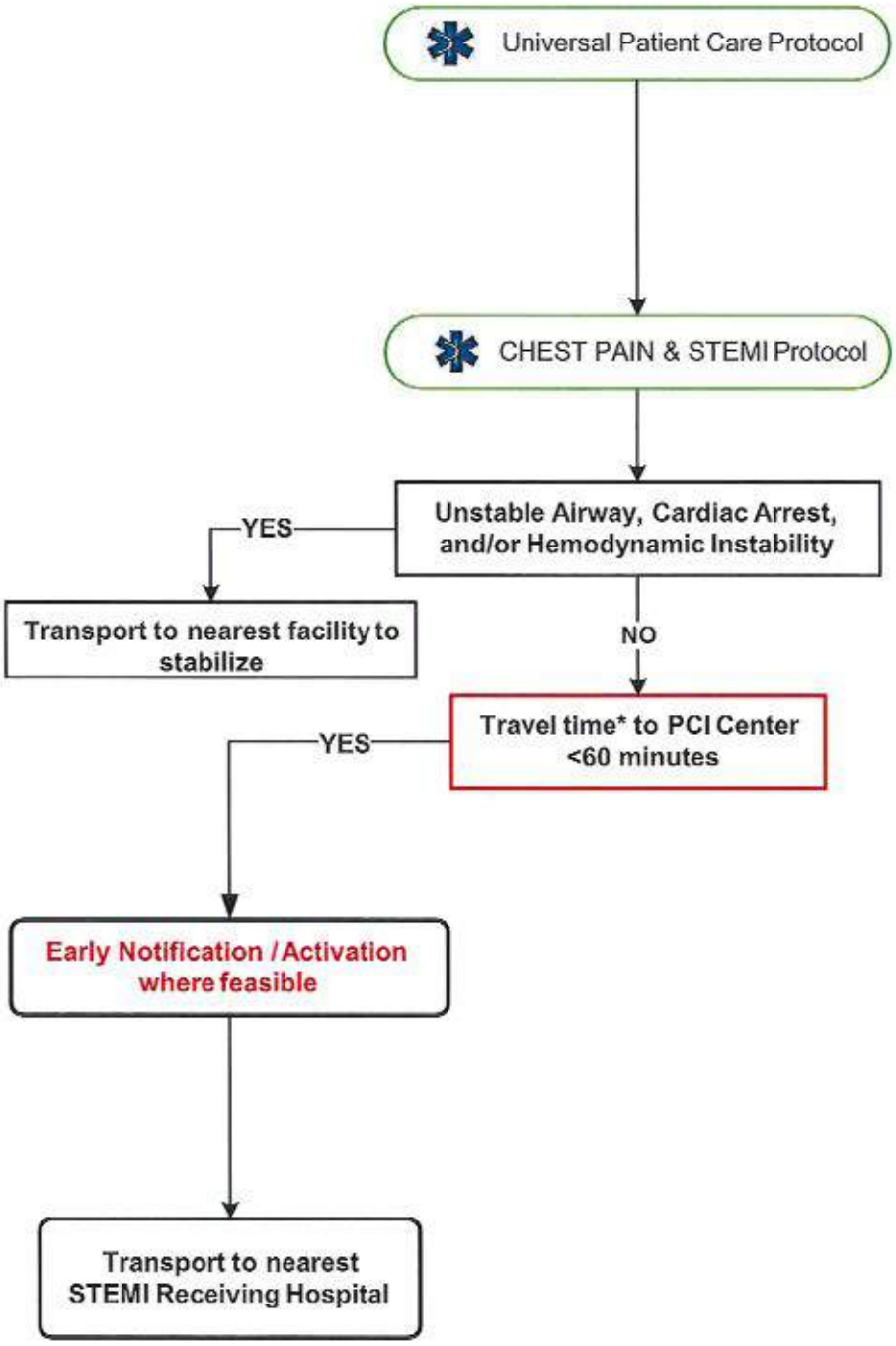
	Normal Axis 0 to 90	Left Axis Physiological 0 to -30	Left Axis Pathological -30 to -90	Right Axis 90 to 180	Extreme Axis -90 to -180	Indeterminate Axis ?
Lead I	Λ	Λ	Λ	V	V	∿
Lead II	Λ	∿	V	Λ	V	∿
Lead III	Λ	V	V	Λ	V	∿

- A patient should have a SBP of 90 or greater to administer Nitroglycerin.
- Preform **serial 12 leads every 10** minutes on NON STEMI patients.
- A right sided 12 lead must be preformed on patients with INFERIOR MI to rule out right sided involvement.
- **DO NOT Administer** Nitroglycerin in patients experiencing and INFERIOR MI or an MI with right sided involvement.
- Consider a posterior 12 lead if depression is present in leads V1-V4.
- COMBO PADS MUST BE PLACED ON ALL STEMI PATIENTS
- If able limit IV sticks to left arm.

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
- **Positive Acute MI (STEMI = cardiac symptoms > 15 minutes and ST segment elevation of 1 mm in 2 or more Anatomically Contiguous Leads**
- ***High Risk:* *Cardiogenic shock* – inadequate tissue perfusion due to low cardiac output. Systolic Blood Pressure 90 mm Hg in setting of acute myocardial infarction. (Killip class III)
- Patients with STEMI (ST-Elevation Myocardial Infarction) or positive Reperfusion Checklist should be transported to the appropriate destination based on the EMS System STEMI Plan
- **Avoid Nitroglycerin (NTG) in patients who use erectile dysfunction medication (Viagra or Levitra < 24 hours; or Cialis < 36 hours) due to possible severe hypotension.**
- **Travel Time* defined with understanding that PCI can be completed within 90 minutes or less including transport time.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (EMT-P)
- Nitroglycerin may be repeated per dosing guidelines. Paramedics repeat dosing with NTG unless hemodynamicallyunstable.
- If patient has taken NTG without relief, consider potency of medication.
- Monitor for hypotension after administration of NTG and/or Narcotics / Opiates
- Perform a patient interview, examination and treatment as simultaneously and expediently as possible, do not excessively delay treatment or transportation of this patient.
- Diabetics and geriatric patients often have atypical pain, or only generalized complaints.

Chest Pain: STEMI Transport



*Consider Air Medical Activation if time to Cath Lab can be achieved in <60 minutes and is NOT ACHIEVABLE by Ground Transport

Chest Pain: STEMI Transport

CHF/Pulmonary Edema

History
- Congestive heart failure
- Past medical history
- Medications (Digoxin, Lasix)
- **Erectile Dysfunction Medication**
- Cardiac history –past myocardial infarction

Signs/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**

Universal Patient Care Protocol

R **Obtain and Record Pulse Ox** R

B **Obtain and Record EtCO2 if available** B

R Supplemental Oxygen to maintain Sat greater than 94% R

B Consider **CPAP / BiPAP** if Available B

P May use **Nitroglycerin Paste** if available 1" applied to chest P

Vascular Access Protocol

B Cardiac Monitor / 12 Lead ECG **Acquisition** B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

M **Notify Destination or Contact Medical Control** M

P Consider (1) **Benzodiazepine** if needed to better tolerate CPAP/BiPAP **Midazolam** (Versed) 1-2 mg

Diazepam- if available see pearls P

If Cardiogenic Shock suspected Consider Dopamine/Epi Drip (see Pearls)

CHF/Pulmonary Edema

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

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Epinephrine Drip Chart

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4 mcg	30
6 mcg	45
8 mcg	60
10 mcg	75

Pearls

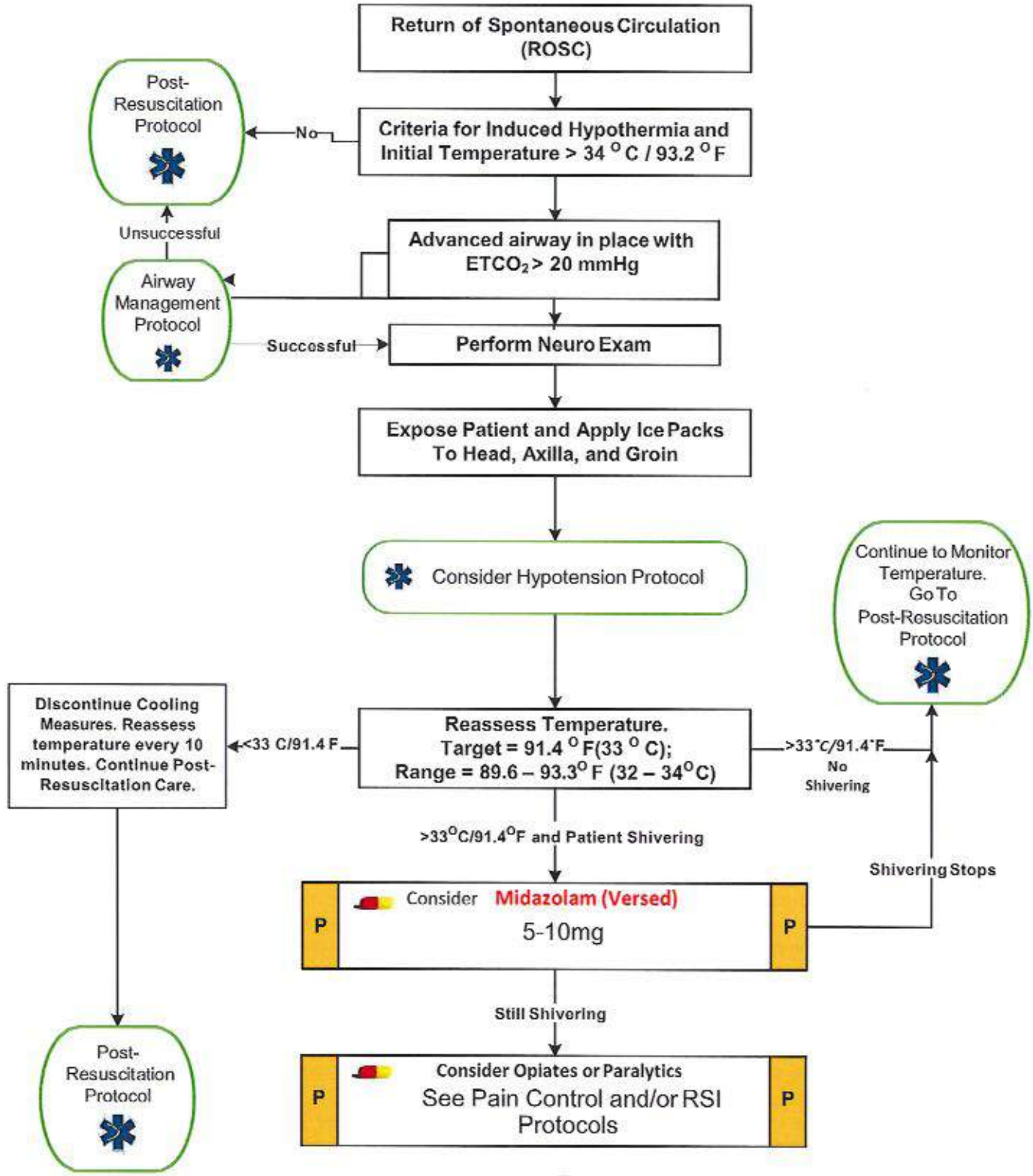
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Avoid Nitroglycerin in any patient who has used erectile dysfunction medication (Viagra or Levitra <24 hours; or Cialis <36 hours) due to potential severe hypotension.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Consider myocardial infarction in all these patients. Diabetics and geriatric patients often have atypical pain, or only generalized complaints.
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- 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.
- If available Diazepam (Valium) 5mg-10 mg

Hypothermia-Induced

History:
- Non-traumatic cardiac arrest (drowning and hanging are permissible in this protocol)

Signs and Symptoms:
- Return of pulse

Differential:
- **Continue to address specific differentials associated with the original dysrhythmia**



Hypothermia-Induced

Pearls

- If BIAD is already in place – DO NOT REMOVE to intubate
- If no advanced airway can be obtained, cooling may only be initiated on order from online medical control
- Take care to protect patient modesty. Undergarments may remain in place during cooling
- Do not delay transportto cool
- Frequently monitor airway, especially after each patient move
- Patients may develop metabolic alkalosis with cooling. Do not hyperventilate.
- **Induction of hypothermia REQUIRES transport of patient to a facility capable of continuing/maintaining hypothermia protocol.**

Inclusion Criteria for Induced Hypothermia

- ✓ ROSC not related to blunt/penetrating trauma or hemorrhage
- ✓ ADULT Patients ONLY. **NOT FOR USE IN PEDIATRICS**
- ✓ Temperature after ROSC greater than 34˚C/93.2˚F degrees
- ✓ Advanced airway in place with no purposeful response to pain
- ✓ Comatose after ROSC; GCS < 8 AND No purposeful movement

EXCLUSION Criteria for Induced Hypothermia

- Uncontrolled GI Bleeding
- Conflict with Do Not Resuscitate (DNR) order.
- Major intracranial, intra-thoracic, or intra-abdominal surgery within last 14 days.
- Sepsis as suspected cause of cardiac arrest.
- Cardiovascular instability as evidenced by: uncontrollable arrhythmias, refractory hypotension.

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

Consider Induced Hypothermia Protocol

B
Continue ventilatory support
- O2 Sats 94%
- EtCO2 ideally 35 – 45

DO NOT HYPERVENTILATE
Remove Impedance Threshold Device
B

Vascular Access Protocol

Airway Protocol

B Cardiac Monitor / 12 Lead ECG **Acquisition** **B**

R **Vital Signs** **R**

P Cardiac Monitor / 12 Lead ECG **Interpretaion** **P**

STEMI Protocol

Continue **Anti -Arrhythmic** if Return of Spontaneous Circulation (ROSC) was associated with its use **and there is continued ectopy.** **P**

Hypotension

Significant Ectopy

Bradycardia

Hypotension Protocol

Ventricular Tachycardia Protocol

Bradycardia Protocol

If arrest reoccurs, revert to appropriate protocol and/or initial successful treatment

M **Notify Destination or Contact Medical Control** **M**

Post Resuscitation

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.
- 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 Pressor Agent to maintain a systolic blood pressure > 100 mmHg. Ensure adequate fluid resuscitation is ongoing.

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

History
- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal failure / dialysis
- DNR or living will

Signs and Symptoms
- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on ECG

Differential
- **Asystole**
- **Artifact / Device failure**
- **Cardiac**
- **Endocrine / Metabolic**
- **Drugs**
- **Pulmonary**

Cardiac Arrest Protocol

The focus is on **QUALITY** CPR until more than 2 responders are on scene

Defibrillate x 1
200j - 300j - 360j escalate as needed

Airway Protocol

5 cycles of CPR

Vascular Access Protocol

Check Rhythm and Pulse

Defibrillate
200j - 300j – 360j escalate as needed

Epinephrine
(May repeat Q 3 – 5 minutes)
1mg of 1:10,000

After 5 Cycles of CPR Check Rhythm and Pulse

Defibrillate x 1
200j - 300j - 360j escalate as needed

Consider Anti-Arrhythmic:
Amiodarone 300mg May repeat 150mg
or
Lidocaine 1mg - 1.5mg/kg may repeat 0.5-0.75mg/kg

Continue CPR x 5 cycles

Criteria For Discontinuation?

NO → **Notify Destination Or Contact Medical Control**

YES → **STOP RESUSCITATION**

Airway Management

When there are only 2 rescuers provide Oxygen via NRB @ 15lpm. Once additional recourses arrive begin BVM ventilations

Our advanced airway device for medical cardiac arrest patients will be BIAD unless otherwise contraindicated.

25 MINUTES

We will work cardiac arrest patients wherever they are unless there is a safety issue.

We will provide high quality resuscitation for 25 minutes prior to making transport decisions.

AT ANY TIME
Return of Spontaneous Circulation
↓
Go to Post Resuscitation Protocol

AT ANY TIME
Rhythm Changes to Nonshockable Rhythm
↓
Go to appropriate protocol

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

H's of ACLS

Causes	Signs	Treatment
Hypovolemia	-Rapid heart rate -Narrow QRS -Blood loss	-Obtain IO/IV Access -Administer fluid/blood -Use fluid challenge
Hypoxia/ Hypoxemia	-Slow heart rate -Cyanosis	-Ensure airway is open -Ventilate -Ensure oxygen supply is adequate
Hydrogen Ion Excess (Acidosis)	-Low amplitude QRS complex	-Attiel blood gas -Provide adequate ventilations -Sodium bicarbonate (metabolic)
Hypokalemia/ Hyperkalemia	-Flattened T waves & a U wave (Hypokalemia) -Peaked T waves & a widened QRS (Hyperkalemia)	-Ventilate (respiratory) -Sodium bicarbonate (metabolic)
Hypothermia	-Shivering -Previous exposure to cold temperatures	-Active warming measures -Temperature should be above 30°C

T's of ACLS

Causes	Signs	Treatment
Tamponade (Cardiac)	-Rapid heart rate -Narrow QRS -JVD -No pulse -Muffled heart sounds	-Pericardiocentesis -Thoracotomy
Toxins	-Prolonged QT interval	-Based on overdose agent -Supportive care
Tension Pneumothorax	-Slow heart rate -Narrow QRS -Unequal breathing -JVD -Tracheal deviation	-Needle decompression -Insertion of a chest tube
Thrombosis (Pulmonary)	-Rapid heart rate -Narrow QRS -Shortness of breath -Decreased oxygen -Chest pain	-Embolectomy -Fibrinolytic therapy -Anticoagulant therapy
Thrombosis (Coronary)	-Abnormal ECG	-Angioplasty -Stent placement -Coronary bypass surgery

- Polymorphic V-Tach (Torsade de Pointes) may benefit from administration of **magnesium sulfate** 1-2mg.

Pearls

- **Recommended Exam: Mental Status**
- Reassess and document endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- Calcium and sodium bicarbonate if hyperkalemia is suspected (renal failure, dialysis).
- **Treatment priorities are: uninterrupted chest compressions, defibrillation, then IV access and airway control.**
- Do not stop CPR to check for placement of ET tube or to give medicines.
- If arrest not witnessed by EMS then 5 cycles of CPR prior to 1st defibrillation.
- Effective CPR and prompt defibrillation are the keys to successful resuscitation.
- If BVM is ventilating the patient successfully, intubation should be deferred until rhythm has changed or 4 or 5 defibrillation sequences have been completed.

Ventricular Tachycardia

History
- Past medical history / medications, diet, drugs.
- Syncope / near syncope
- CHF
- Palpitations
- Pacemaker
- Allergies: lidocaine / novacaine

Signs and Symptoms
- Ventricular tachycardia on ECG (Runs or sustained)
- Conscious, rapid pulse
- Chest pain, shortness of breath
- Dizziness
- Rate usually 150 - 180 bpm for sustained V-Tach
- **QRS > .12 Sec**

Differential
- **Artifact / Device failure**
- **Cardiac**
- **Endocrine / Metabolic**
- **Drugs**
- **Pulmonary**

Universal Patient Care Protocol

B — Cardiac Monitor / 12 Lead EKG **Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

- **Palpable Pulse**
- **Wide, Regular Rhythm**
- **QRS > 0.12 s**

No → Exit to Appropriate Protocol

If Rhythm Changes Or Becomes Pulseless → Exit to Appropriate Protocol

YES

Vascular Access Protocol

Stable

P — Consider **Adenosine * [Regular Monomorphic Rhythm Only]** — P
1st dosage 6 mg 2nd Dosage 12 mg
Max of 18 mg

P — **AntiArrhythmic Therapy**
Amiodarone 150mg over 10 mins
or
Lidocaine 0.5mg - 0.75mg/kg — P

If Unsuccessful – Rapid Transport with Early Destination Notification

Becomes Unstable ?

YES → **Unstable**

P — Consider **Benzodiazepines** Midazolam 1-2mg — P

P — **Synchronized Cardioversion** — P
May Repeat as Needed
100j - 200j - 300j - 360j

P — **Polymorphic Ventricular Tachycardia** — P
Unsynchronized Cardioversion
200j, 300j, 360j
(increase and repeat as needed)

NO →

P — **Antiarrhythmic Therapy** — P
Amiodarone 150mg over 10 mins
or
Lidocaine 0.5mg - 0.75mg/kg

B — Repeat 12 Lead EKG **Acquisition** — B

M — **Notify Destination or Contact Medical Control** — M

Ventricular Tachycardia

- Amiodarone Maintenance Infusion- 150mg into a 100ml bag of D5W, use 10gtts, administer 40gtts/min

- Lidocaine (premixed bag) -2g into 500ml=4mg/ml. Doseage is 2-4mg/min. Use 60gtts. 30gtt/min=2mg/min, 45gtt/min=3mg/min, 60gtts/min=4mg/min.

❖ Polymorphic V-Tach (Torsades de Pointes) may benefit from the administration of **Magnesium Sulfate** if available.

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- For witnessed / monitored ventricular tachycardia, try having patient cough.
- If presumed hyperkalemia (end-state renal disease, dialysis, etc.), administer **Sodium Bicarbonate.**
- *** Adenosine should NOT be given for unstable or for irregular or for polymorphic wide-complex tachycardias as it may cause degeneration of the arrhythmia to Ventricular Fibrillation.**

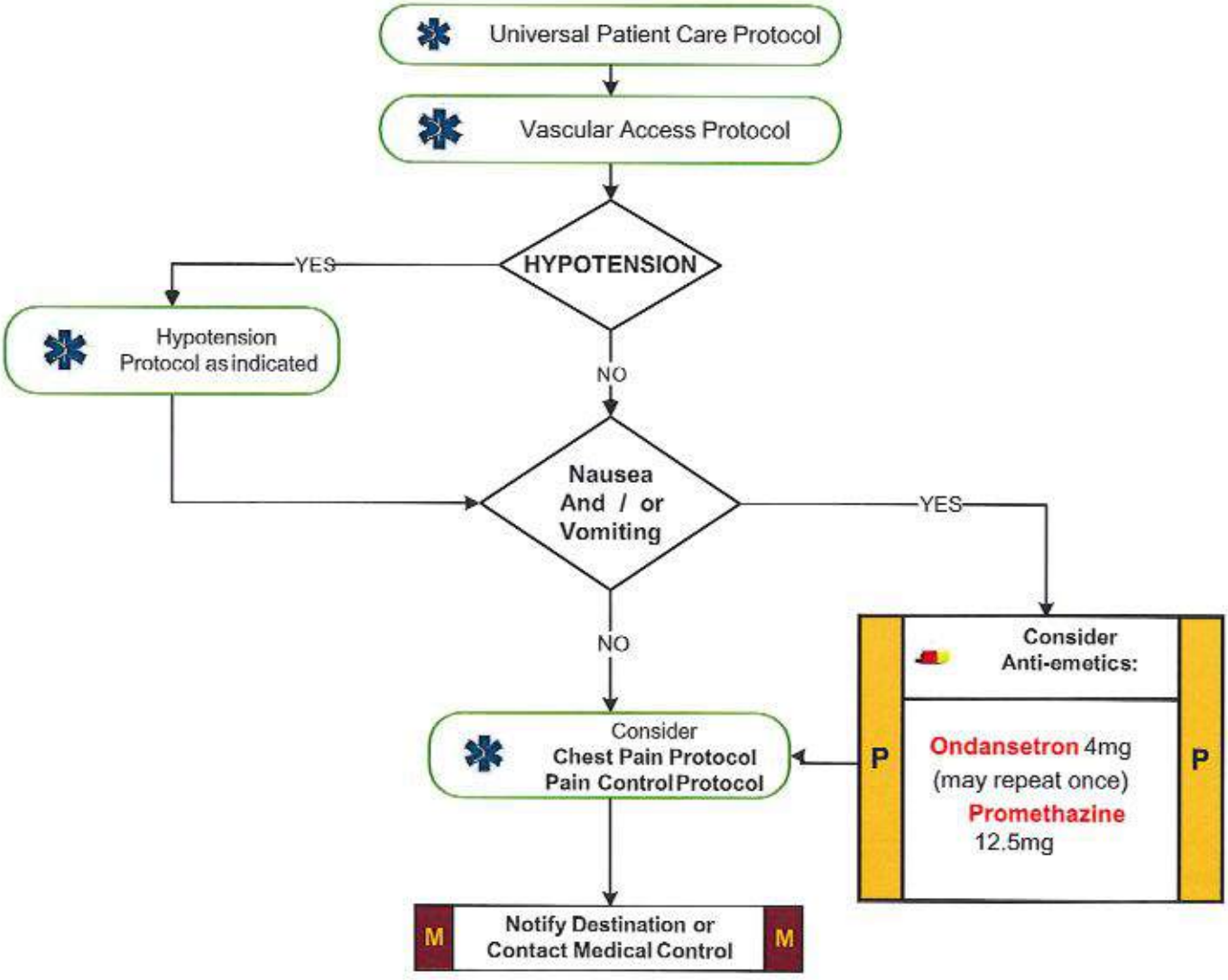
Abdominal Pain

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

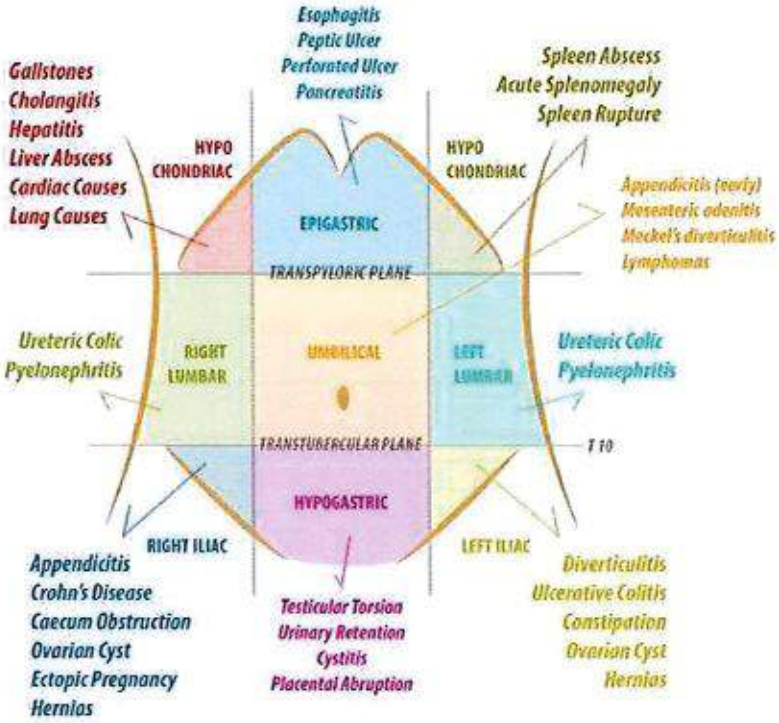
Differential
- **Pneumonia or Pulmonary embolus**
- **Liver (hepatitis, CHF)**
- **Peptic ulcer disease / Gastritis**
- **Gallbladder**
- **Myocardial Infarction**
- **Pancreatitis**
- **Kidney stone**
- **Abdominal aneurysm**
- **Appendicitis**
- **Bladder / Prostate disorder**
- **Pelvic (PID, Ectopic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



Abdominal Pain

QUADRANTS OF ABDOMEN

DIFFERENTIAL DIAGNOSIS (PAIN)



Pearls

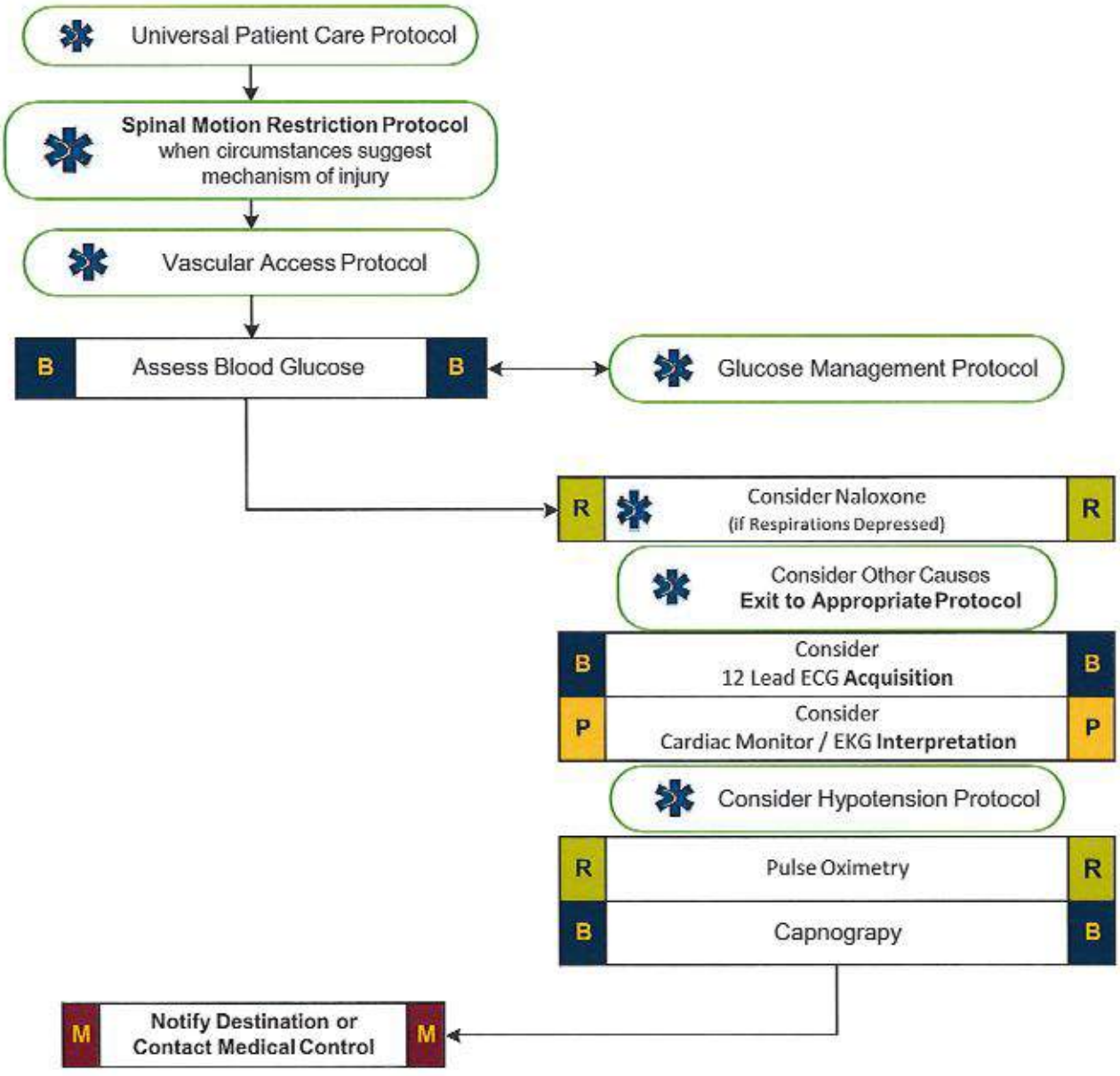
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neuro**
- Document the mental status and vital signs prior to administration of anti-emetics.
- Abdominal pain in women of childbearing age should be treated as an ectopic pregnancy until proven otherwise.
- Antacids should be avoided in patients with renal disease.
- The diagnosis of abdominal aneurysm dissection should be considered with abdominal pain in patients over 50.
- Repeat vital signs after each bolus.
- Appendicitis may present with vague, peri-umbilical pain which migrates to the RLQ over time.

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

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



Altered Mental Status

A	Alcohol Acidosis metabolic disorders) Ammonia (hepatic encephalopathy) Arrhythmias (any cardiac cause)
E	Endocrine Electrolytes Encephalopathy
I	Infection
O	Oxygen Overdose/ Opiates
U	Uremia
T	Trauma Temperature (hyper/hypothermia) Thiamine (Wernicke-Korsakoff)
I	Insulin (hypo/hyperglycemia)
P	Poisoning (all medications) Pyschiatric
S	Stroke Seizure (or postictal state) Syncope Space occupying lesions Shunt (VP) malfunction

Pearls

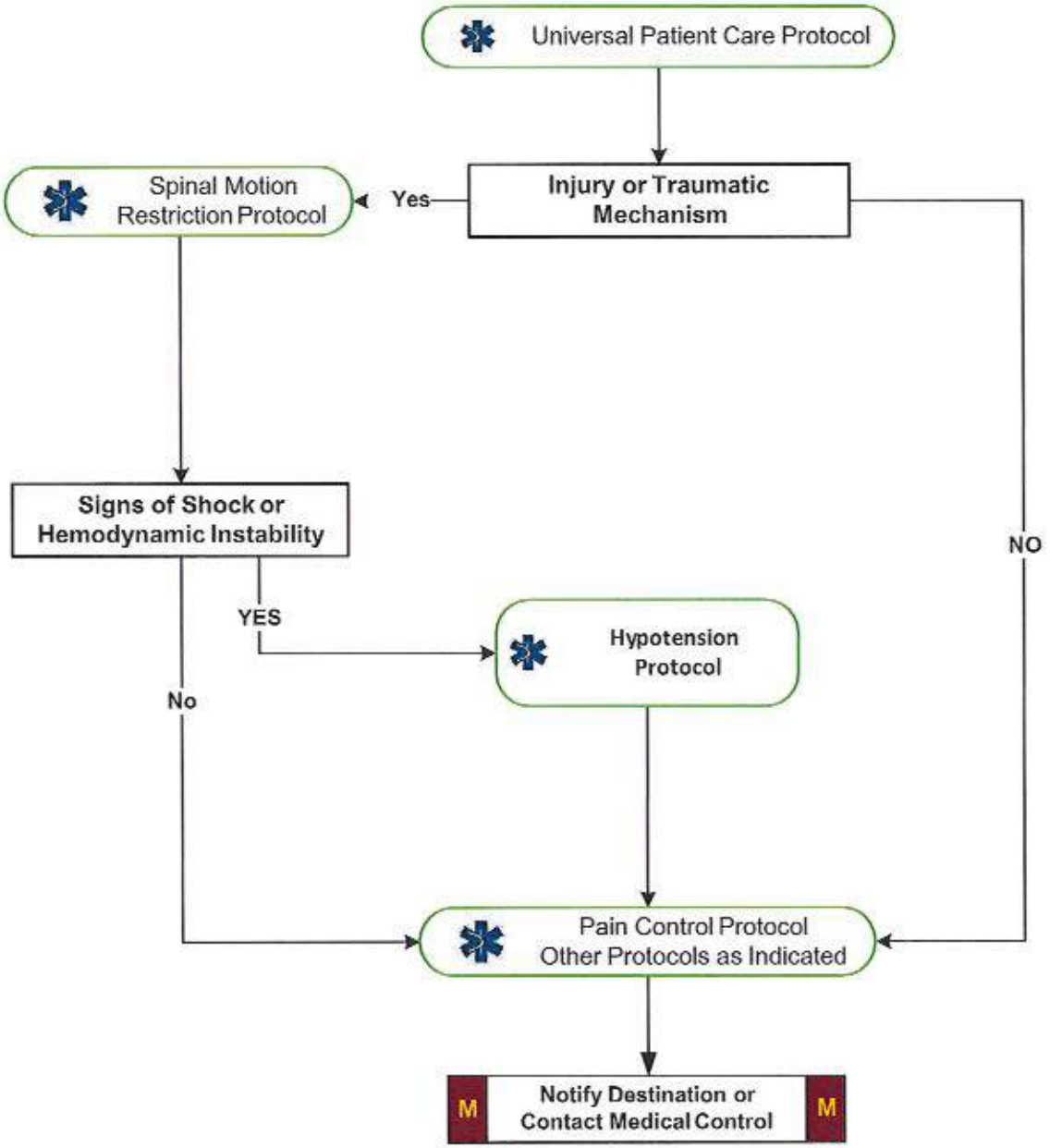
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro. Pay careful attention to the head exam for signs of bruising or other injury.**
- Naloxone may be given by EMRs, EMTs, or AEMTs by either auto-injector or nasal spray only per local medical controloption.
- 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.

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**



Back Pain

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Abdomen, Back, Extremities, Neuro**
- Abdominal aneurysm dissections are a concern in patients over the age of 50.
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.
- 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.

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

Scene Safety

Universal Patient Care Protocol

R
- Remove patient from stressful environment
- Use verbal calming techniques because communication is very important. (reassure, clam, establish rapport)
- GCS on ALL patients

R

Consider Other Causes
EXIT To Appropriate Protocol:
- **Altered Mental Status**
- **Overdose / Toxic Ingestion**
- **Head Trauma**

B **Assess Blood Glucose** B ↔ Glucose Management Protocol

Suspected excited delirumm (Paranoia,disorientation, hyper-aggresion, hallucination, tachycardia, increased strength, hyperthermia

YES →
- Sedation Protocol
- Hypotension Protocol
- Hyperthermia Protocol

NO

M **If Patient Refuses Care and/or Transport Contact Medical Control** M

R **RESTRAINT Procedure** R

Consider Sedation Protocol

M **Notify Destination or Contact Medical Control** M

Cardiac Arrest ?

YES

P Consider **Sodium Bicarbonate** 1 meq/kg P

Cardiac Arrest Protocol

NO

Behavioral

Pearls

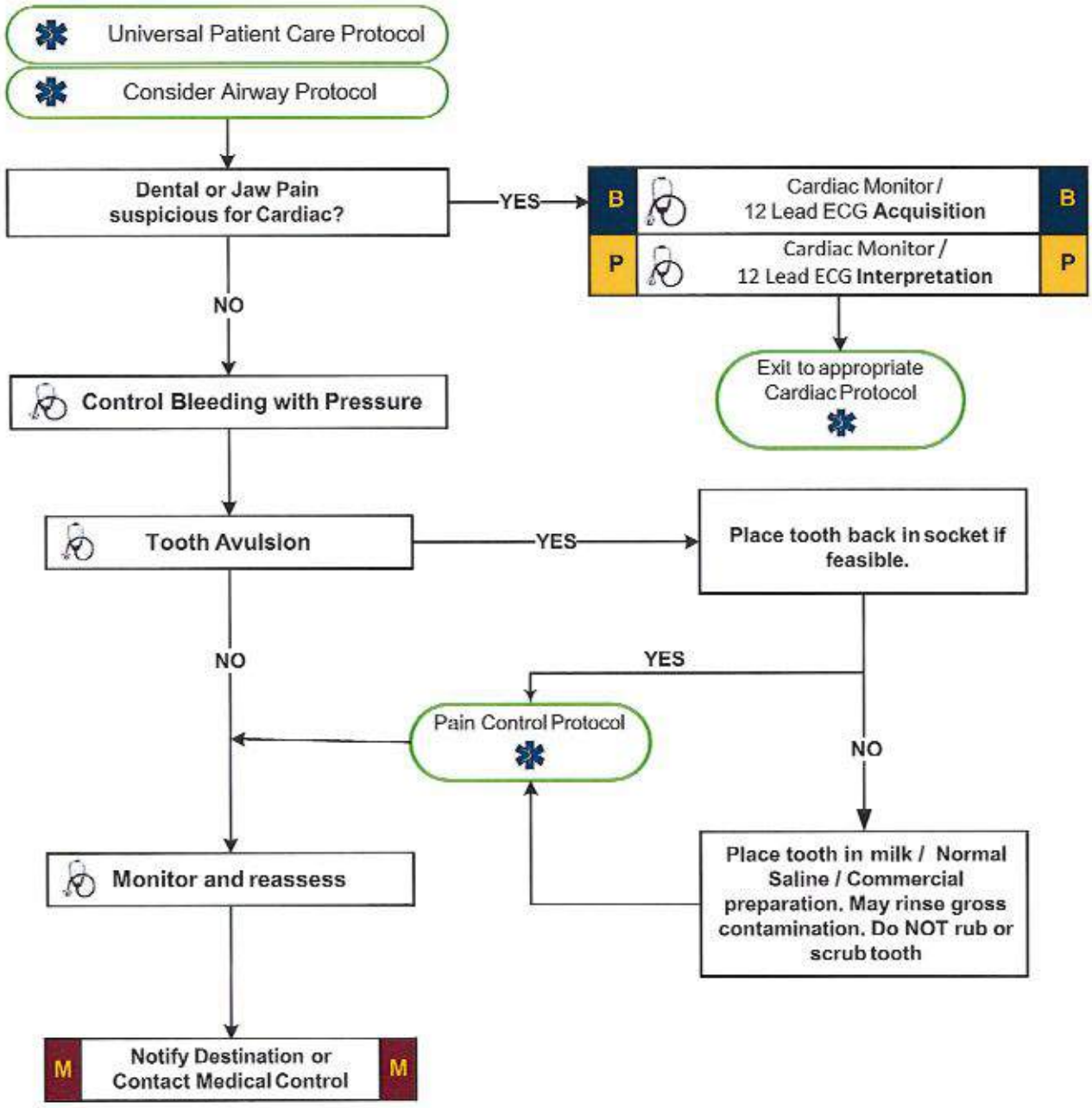
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Neuro**
- Your safety first!!
- **Consider Geodon for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Hyperthermic patients may require aggressive cooling measures.
- 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.
- **All patients who receive either physical or chemical restraint should be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.

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



Dental Problems

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.
- All tooth disorders typically need antibiotic coverage in addition to pain control.
- 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).
- DO NOT replace tooth if:
  - Obtunded patient
  - At risk for Aspiration
  - Spinal Immobilization
  - AMS
  - Multiple Teeth missing

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

Universal Patient Care Protocol

Shunt / Fistula Bleeding — YES → R: Apply firm finger tip pressure to bleeding site; Apply dressing but avoid bulky dressing; Dressing must not compress fistula / shunt as this will cause clotting of the shunt R

NO

CHF / Pulmonary Edema — YES → Exit to CHF / Pulmonary Edema Protocol

NO

Cardiac Arrest — NO → Serious Signs / symptoms — NO → Exit to Appropriate Protocol

YES

P: Calcium Chloride or Calcium Gluconate 1-2 g; Sodium Bicarbonate 1 meq/kg P

Exit to Appropriate protocol

YES

B: Blood Glucose Analysis B

B: 12 Lead ECG Acquisition B

Glucose Management Protocol

Vascular Access Protocol

P: Cardiac Monitor/EKG Interpretation P

Hemodialysis in past 4 hours – OR – Signs of Shock or Hypoperfusion — YES → Systolic Blood Pressure < 90 — YES → Hypotension Protocol

NO

NO

Symptomatic with Peaked T Wave QRS >0.12 sec — YES → Consider

P: Calcium Chloride or Calcium Gluconate 1-2 g; Sodium Bicarbonate 1 meq/kg P

B: Albuterol 2.5mg - 5mg B

NO

M: Notify Destination or Contact Medical Control M

Dialysis / Renal Failure

- Do no mix sodium bicarbonate and calcium in the same flowing IV line.

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.**
- 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.

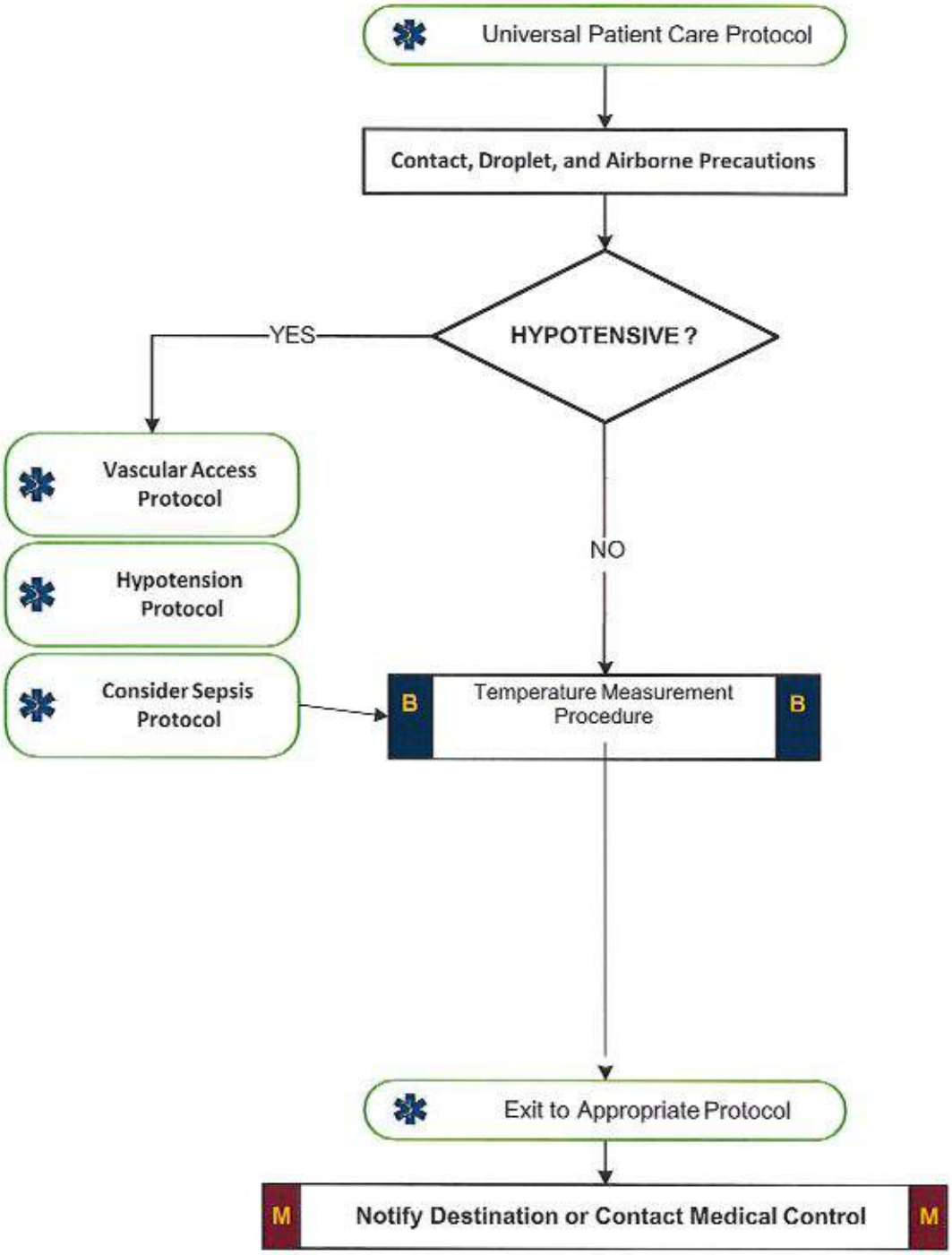
Fever / Infection Control

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**



Fever / Infection Control

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.
- **Contact 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 i s 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 NSAID's (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen.
- NSAID's should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child.

Hypertensive Emergency / Urgency

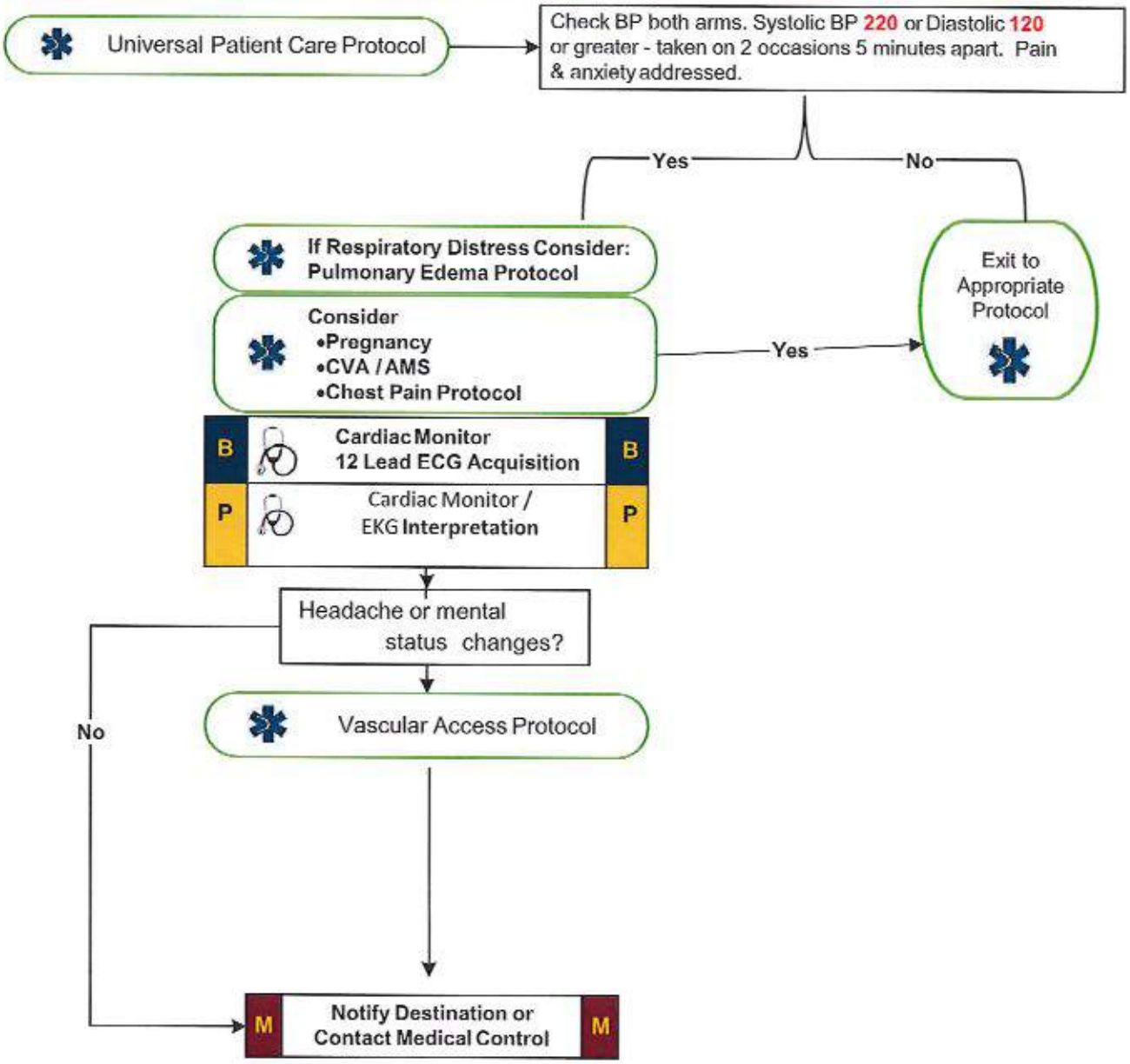
History
- Documented hypertension
- Related diseases: diabetes, CVA
- renal failure, cardiac
- Medications (compliance ?)
- Erectile dysfunction medication (Levitra/Cialis/Viagra)
- Pregnancy

Signs and Symptoms One of these
- Systolic BP 220 or greater
- Diastolic BP 120 or greater

AND at least one of these
- Headache
- Nosebleed
- Blurred vision
- Dizziness
- Chest Pain
- SOB
- AMS
- Hematuria

Differential
- **Hypertensive encephalopathy**
- **Primary CNS Injury (Cushing's response = bradycardia with 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.



Hypertensive Emergency / Urgency

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Never treat elevated blood pressure based on one set of vital signs or on vital signs alone.**
- Symptomatic hypertension is typically revealed through end organ damage to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated.

Hypotension (Symptomatic)

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
- Cardiomyopathy
- Trauma

Signs and Symptoms
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- 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)**

Universal Patient Care Protocol

Vascular Access Protocol

Trauma

Treatment per appropriate Trauma Protocol

A Fluid Bolus to Maintain **Systolic BP > 90 mmHg** 250ml may repeat to maintain BP A

P **Consider Vasopressor Infusion for Neurogenic Shock** Dopamine 2-10 mcg/kg/min or Epinephrine 2-10mcg/min P

Non-Cardiac / Non-Trauma

A **Normal Saline Bolus** **May Repeat To Total 30mL/Kg** 250ml A

P **Consider Vasopressor Infusion** Dopamine 2-10 mcg/kg/min or Epinephrine 2-10mcg/min P

Consider Sepsis Protocol

Cardiac

Treatment per appropriate Cardiac Protocol

A No rales present Consider **Normal Saline Bolus** 250ml may repeat x 1 A

P **Consider Vasopressor Infusion** Dopamine 2-10 mcg/kg/min or Epinephrine 2-10mcg/min P

M **Notify Destination or Contact Medical Control** M

Hypotension (Symptomatic)

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/KG/MIN	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Epinephrine Drip Chart

Ensure you have 8mcg/ml Concentration for this chart - Mix 2mg Epi 1:1,00 in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/MIN	gtts/min
2 mcg	15
4 mcg	30
6 mcg	45
8 mcg	60
10 mcg	75

❖ Dopamine and or Epinephrine contraindicated in hypovolemic shock

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 interprete d in context and patient s typical BP if known.
- Repeat Vital Signs AFTER each Bolus or Change in Pharmacologic Therapy (Change in Dose or Agent).
- 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 ventrical/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.

Pain Control: Adult

History
- Age
- Location
- Duration
- Severity (1 - 10)
- 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)**

Universal Patient Care Protocol

Patient care according to **Protocol** based on **Specific Complaint**

Pain Severity > 6 out of 10
Or
Indication for IV /IM Medication

NO → A | Consider If Available: **Nitrous Oxide** Self Administered 50/50 mix with Oxygen | A

YES

R | **Pulse Oximetry** | R

Vascular Access Protocol

A	Consider: Nitrous Oxide	A
P	Morphine or Fentanyl * * **ONLY** these doses may be administered PRIOR to OLMC contact	P
P	**Morphine*** 0.1 mg/kg up to 5 mg. May repeat x 1 Q 5 minutes. Max Dose = 10 mg Or **Fentanyl*** 2 mcg/kg up to 100 mcg. May repeat x 1 Q 5 minutes. Max Dose = 200 mcg	P
P	Consider anti-nausea medication as needed Ondansetron- 4mg may repeat x1 or Promethazine- 12.5mg	P

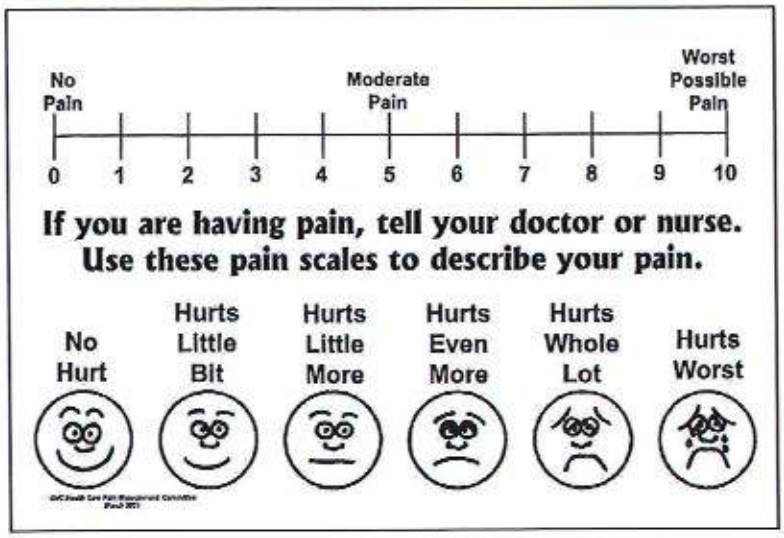
B | Must reasssess patient at least **every 15 minutes** after sedative medication | B

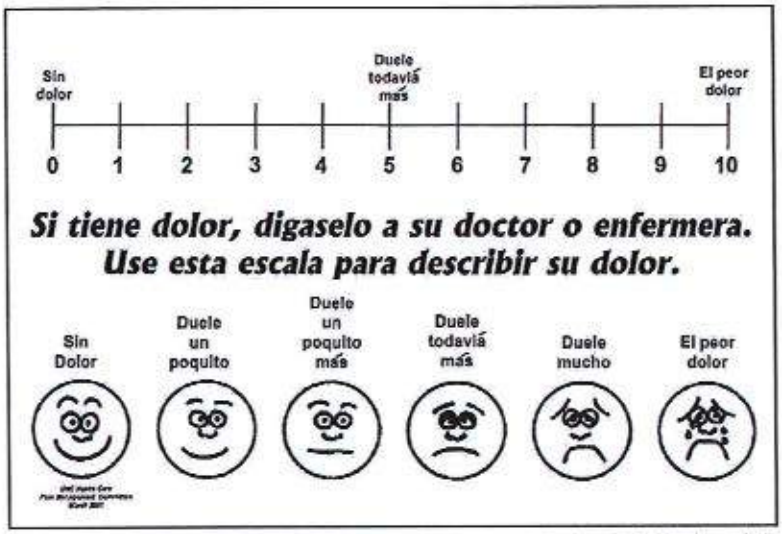
M | **Notify Destination or Contact Medical Control** | M

Morphine OR Fentanyl Doses listed in this protocol may be used PRIOR to contact with OnLine Medical Control

Relative Contraindications For IV Pain Control:
- Severe Head Injury
- End-Stage Lung Disease
- Untreated Hypotension

Pain Control: Adult





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.

A physician's signature is required for any patient who receives pain medications.

Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded pre and post IV, IM, IN medication delivery and at disposition.**
- **Vital signs should be obtained pre, 15 minutes post, and at disposition with all pain medications.**
- Relative Contraindications to the use of a **narcotic** include hypotension, head injury, respiratory distress or severe Lung Disease.
- **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, or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- **Ibuprofen** should not be given for headaches or 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, headaches, or abdominal pain.
- Do not administer **Acetaminophen** to patients with a history of liver disease.
- See drug list for other contraindications for Narcotics, Acetaminophen, Nitrous Oxide, and Ibuprofen.

Seizure

Histor
- 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

Differentia
- 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

Universal Patient Care Protocol → Spinal Motion Restriction Protocol

* For Actively seizing Patients on EMS arrival (i.e. without IV) consider IM / IN **Midazolam** 5 mg

R — Pulse Ox / EtCO2 — R
B — **Cardiac Monitor 12 Lead ECG Acquisition** — B
P — Cardiac Monitor / EKG **Interpretation** — P

Vascular Access Protocol

Airway Protocol

Glucose Management Protocol ↔ B — **Assess Blood Glucose** — B

Seizing *
- NO → Monitor and Transport
- YES → P — **Benzodiazepines** Midazolam 2.5mg- 5mg IV/IO/IM/IN Max 10mg; Diazepam if available see pearls — P
  May Repeat x 1 in 5 mins

Seizure Recurs?
- YES → P — **Benzodiazepines** Midazolam 2.5mg- 5mg IV/IO/IM/IN Max 10mg; Diazepam if available see pearls — P
  May Repeat x 1 in 5 mins
- NO → Monitor and Transport

Still Seizing ?
- NO → Monitor and Transport
- YES → Active Seizure in Known or Suspected Pregnancy > 20 weeks [? Ecclampsia or recent post-partum]
  P — Consider **Magnesium Sulfate** 4g IV over 2-3 minutes — P

Monitor and Transport → M — **Notify Destination or Contact Medical Control** — M

Seizure

- If availiable Diazepam 5mg-10mg IV/IO/Per Rectum

Pearls

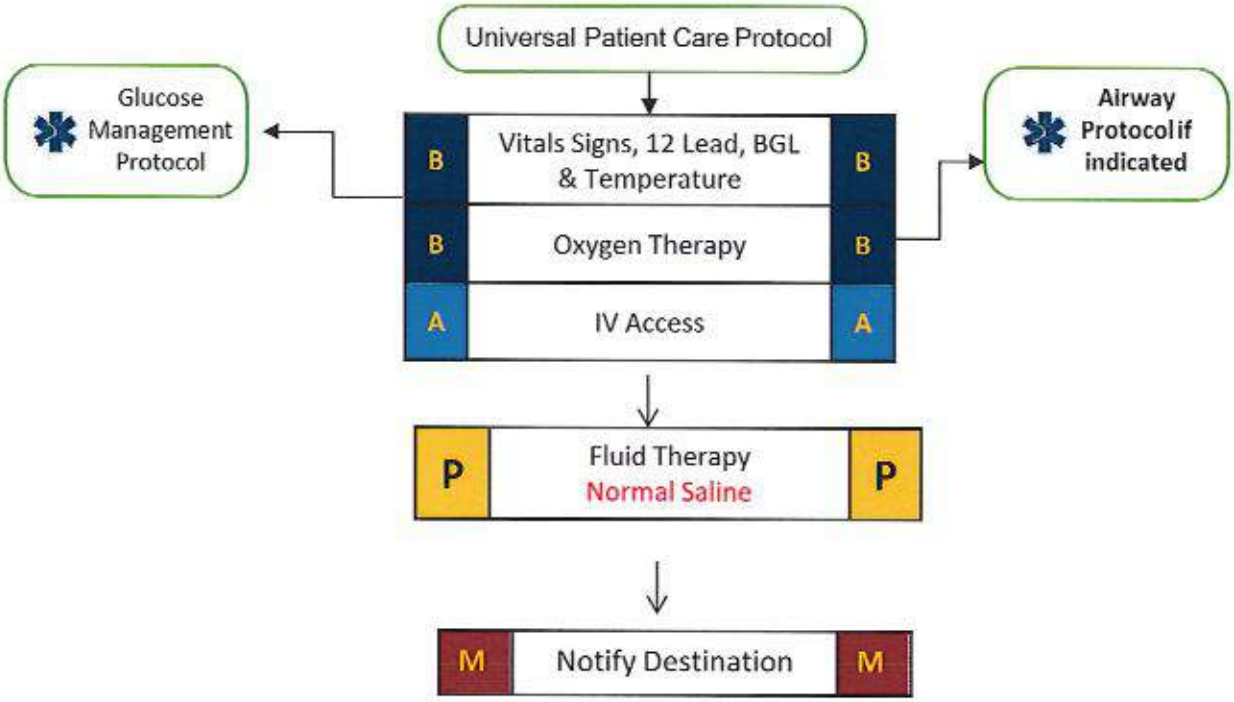
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- ***Status epilepticus*** is defined as two or more successive seizures without a period of consciousness or recovery. This 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)** effect only a part of the body and are not usually associated with a loss of consciousness
- **Jacksonian seizures** are seizures which start as a focal seizure and become generalized.
- 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 or recently delivered patient, follow the OB Emergencies Protocol.
- **For actively seizing patients on EMS arrival, (i.e. no IV) consider IM VERSED prior to establishing IV access.**
- **Diazepam** (Valium) is not effective when administered IM. It should be given IV or Rectally. **Midazolam** is well absorbed when administered IM

Sepsis

History
- Age > 18 years old
- Duration of fever
- Severity of Fever
- Altered Mental Status
- Past Medical History
- Medications
- Immunocompromise
  - Transplant
  - HIV
  - Diabetes
  - Cancer
- Environmental Exposure
- Last Acetaminophen

Signs and Symptoms/ Significant Findings:
- Hyperthermia (>100.4°F / 38° C)
- Hypothermia (< 95°F / 35° C)
- Tachypnea
- Tachycardia
- Acute mental status change
- Urinary Tract Infection
- Pneumonia
- Skin / soft tissue infection
- Abdominal Infection
- Wound Infection
- Suspected meningitis, endocarditis, or osteomyelitis

Differential:
- Altered Mental Status
- ARDS
- Diabetic Ketoacidosis
- Stroke
- Medications Reaction
- Pulmonary Embolism
- Trauma



CODE SEPSIS

Patient **MUST** meet **TWO** of the following qualifiers **&** have **Suspicion of infection**

Temperature	>100.4°F or < 96.4°F
Heartrate	>90
Respiratory Rate	>20

Sepsis

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/KG/MIN	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Pearls:

- Utilize **Sepsis Checklist**
- **Septic Shock:**
  - Hypotension (SBP <90 mmHg) refractory to fluid bolus.
  - **Consider Pressor Agents [Norepinephrine is preferred agent in septic shock.]**
- Bolus Fluids up to 30 mL / Kg for Hypotension in Sepsis.
- If possible meningitis, utilize precautions and notify receiving ED facility of possible meningitis.
- Code Sepsis is a non emergent return unless warranted otherwise based on the patient's condition.
- Rehydration with fluids increases the patients ability to sweat and allows for heat loss so remember to keep patient covered.

Suspected Stroke

History
- Prior Stroke / TIA
- 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**
- **Hypoglycemia**
- **Tumor**
- **Trauma**

Universal Patient Care Protocol

B **Assess Blood Glucose** B

B **Cardiac Monitor 12 Lead ECG Acquisition** B

Go To Glucose Management Protocol

R **Prehospital Stroke Screen Use RACE Stroke Tool** R

Transport ALL Patients with a RACE Score > 0 and Last Known Time Well < 22 Hours EMERGENTLY

If Positive and Symptoms < 22 hours, Transport to the Destination as per the **EMS System Stroke Plan.** **Limit Scene Time to 15 minutes. Provide Early Notification**

Code Stroke = Last Known Well Time **0-4.5 hours**

Stroke Alert = Last Known Well Time **4.5-22 hours**

Vascular Access Protocol

Consider Other Protocols as Indicated:
Altered Mental Status
Hypertension / Hypotension
Seizure
Overdose / Toxic Ingestion

M **Notify Destination or Contact Medical Control** M

South Carolina **RACE Score 4** suggestive of Large Vessel Occlusion [LVO]

Suspected Stroke

- On **ALL** code strokes or stroke alerts 12 leads must be submitted to EC prior to arrival with 2 identifiers.
- Stroke patients are to have blood drawn and labeled on arrival in premade stroke blood kits.
- Radio report must include:
  - Age/Gender
  - Last known well time
  - RACE score
  - Vitals with BGL
  - If the patient is on any blood thinners and last time taken

- **Any score > 0 is a "Stroke Alert"**
- **Any score ≥ 4 is likely an LVO** (consider helicopter early) If can get patient to a CSC within 30 minutes by helicopter or ground transport.

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**
- **RACE is based on Acute Non-Traumatic Symptoms ONLY.**
- **ALL RACE SCORES > 0 are indicative of Stroke.**
- **RACE SCORE ≥ 4is INDICATIVE of Large Vessel Occlusion (LVO) Stroke that may benefit from interventional procedures.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient. With a duration of symptoms of less than 22 hours, scene times should be limited to 10 minutes, early destination notification/activation should be provided and transport times should be minimized based on the EMS System Stroke Plan.**
- **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 of the previous night when patient was symptom free)
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Elevated blood pressure is commonly present with stroke. Consider treatment per Hypertensive Protocol.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit.
- Document the Stroke Screen results in the PCR.
- Document the 12 Lead ECG as a procedure in the PCR.

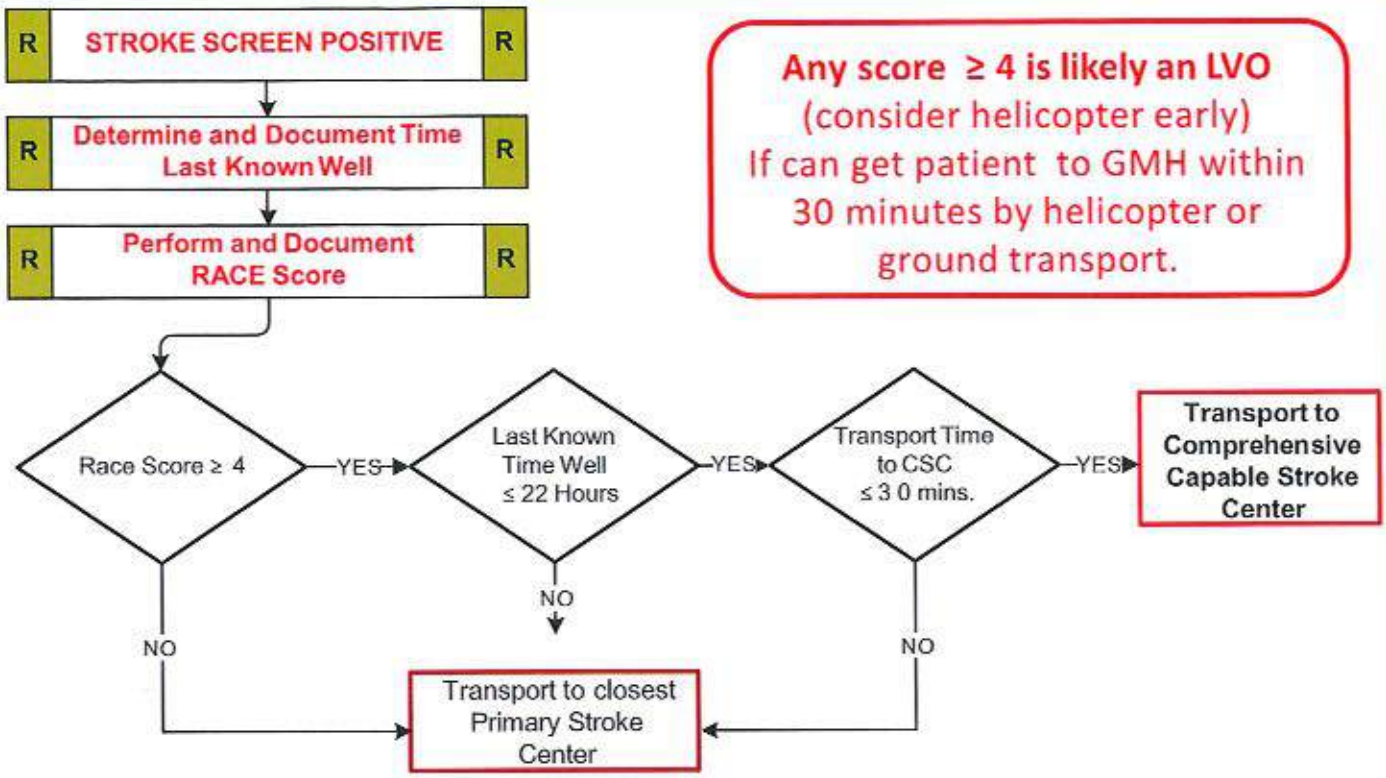
Suspected Stroke
R.A.C.E. Score

SC EMS R. A. C. E. Stroke Scale

Rapid **A**rterial o**C**clusion **E**valuation Scale

	Instruction	RESULT	SCORE
Facial Palsy	Ask Patient to show their teeth (Smile)	**Absent** (symmetrical movement)	0
		Mild (slightly asymmetrical)	1
		Moderate to **Severe** (completely asymmetrical)	2
Arm Motor Function	Extending the arm of the patient 90 ^{o} (if sitting) or 45 ^{o} (if supine) palms up	**Normal** to **Mild** (limb upheld more than **10** seconds)	0
		Moderate (limb upheld less than **10** seconds)	1
		Severe (patient unable to raise arm against gravity)	2
Leg Motor Function	Extending the leg of the patient 30 ^{o} (in supine) One Leg at a time	**Normal** to **Mild** (limb upheld more than **5** seconds)	0
		Moderate (limb upheld less than **5** seconds)	1
		Severe (patient unable to raise leg against gravity)	2
*Head & Gaze Deviation	Observe range of motion of eyes and look for head turning to one side	**Absent** (normal eye movements to both sides and no head deviation was observed)	0
		Present (eyes and/or head deviation to one side was observed)	1
*Aphasia [IF patient has **RIGHT** sided weakness]	Ask patient to follow two simple commands: ***1. Close your eyes. 2. Make a fist***	**Normal** (performs both tasks requested correctly)	0
		Moderate (performs only 1 of 2 tasks requested correctly)	1
		Severe (Cannot perform either task requested	2
Agnosia [IF patient has **LEFT** sided weakness]	Inability to recognize familiar objects. Ask patient: ***1. "Whose arm is this?"*** (while showing the affected arm). ***2. "Can you move your arm?"***	**Normal:** Appropriate or correct answer	0
		Moderate (does not recognize limb or states that they can move it - but cannot)	1
		Severe (does not recognize arm and is unaware of arm)	2
* Head/Eye Gaze Deviation or if patient is mute and does not follow commands = HIGH likelihood of Large Vessel Occlusion (LVO)		**RACE SCALE TOTAL =** **Maximum RACE Score = 9**	

Adult Stroke Patient Destination Determination by Stroke Center Capability



Any score ≥ 4 is likely an LVO
(consider helicopter early)
If can get patient to GMH within 30 minutes by helicopter or ground transport.

Comprehensive Stroke Center

- Physician / Nursing Staff trained in neurologic care on-site 24 hours a day
- Organized Emergency Department with written pathway for rapid identification and management of acute stroke patient
- CT of the head withtechnician on-slte 24 hours a day
- Clinical Laboratory Services
- 24 / 7 Stroke Call and capabilities for IV tPA therapy for eligible patients
- 24 / 7 Endovascular Call and capabilities for endovascular therapy for eligible patients
- 24 / 7 Neurosurgery Call
- Neuro-Intensive Care Unit and neurointensivists
- Stroke Registry and Quality Improvement Process
- Accredited Comprehensive Stroke Center (CSC)

Primary Stroke Center

- Physician / Nursing Staff trained in neurologic care on-site 24 hours a day
- Organized Emergency Department with written pathway for rapid identification and management of acute stroke patient
- CT of the head withtechnician on-site 24 hours a day
- Clinical Laboratory Services
- 24 / 7 Stroke Call and capabilities for IV tPA therapy for eligible patients
- Stroke Registry and Quality Improvement Process
- Accredited Primary Stroke Center (PSC)

Non-Stroke Hospitals

No organized treatment for acute stroke

Acute Stroke Ready Hospital

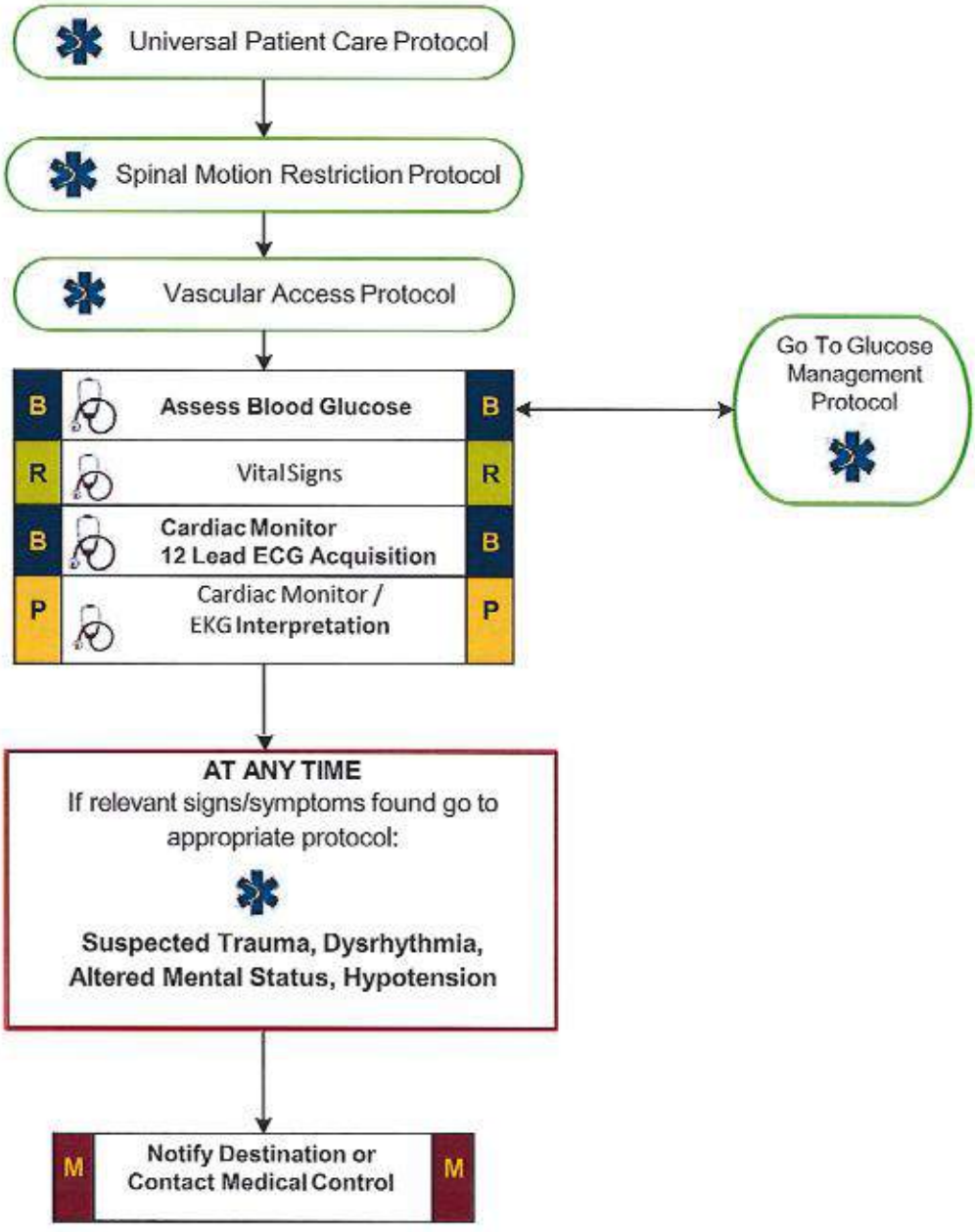
- Emergency Department 24 hours a day with Physician or physician extender and nursing staff trained in neurological care on-site 24 hours a day.
- CT of the head with technician on-site 24 hours a day
- Clinical Laboratory Services
- Telestroke Video – Conferencing Capabilities
- 24 / 7 Capabilities for IV tPA therapy for eligible patients
- Transfer agreement established in advance to ensure orderly transition from Level II Stroke Hospital to specialized stroke care facility
- Stroke Registry and Quality Improvement Process
- Accredited Acute Stroke Ready Hospital (ASRH)

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
- Micturation / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicologic (Alcohol)
- Medication effect (hypotension)
- AAA
- PE



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 related to cardiac dysrhythmia.

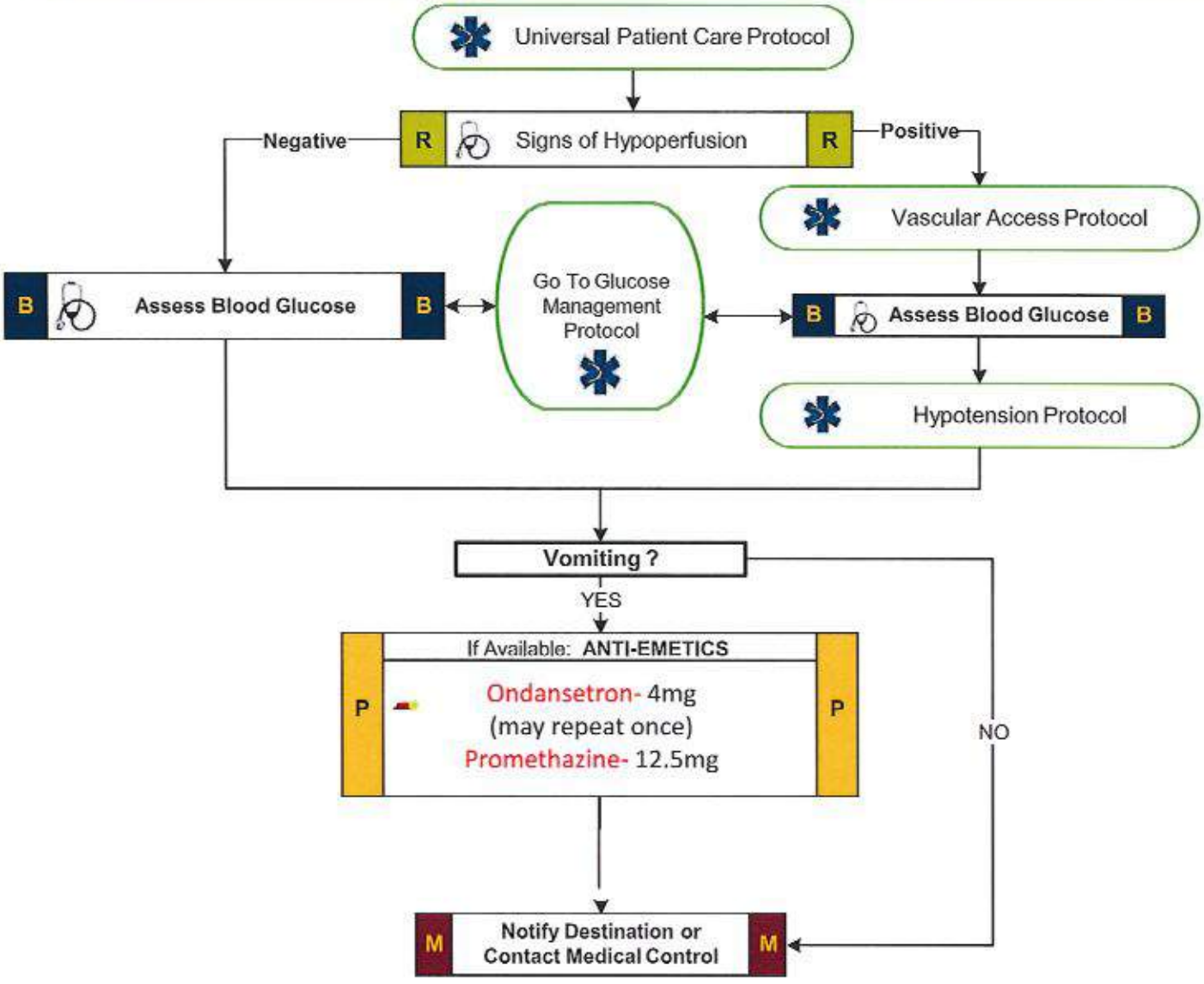
Vomiting and Diarrhea

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

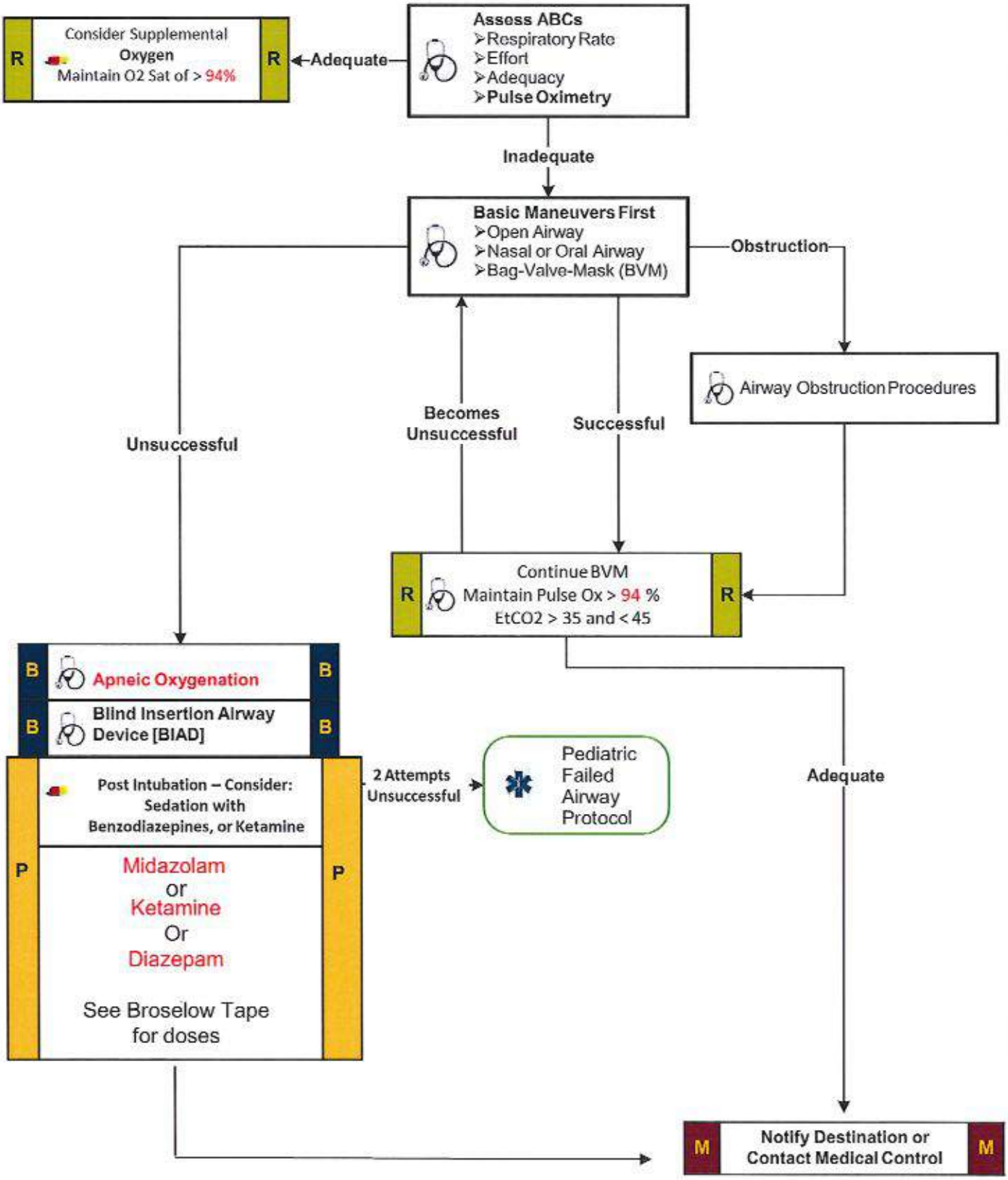
Differential
- **CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)**
- **Myocardial infarction**
- **Drugs (NSAID's, antibiotics, narcotics, chemotherapy)**
- **GI or Renal disorders**
- **Diabetic ketoacidosis**
- **Gynecologic disease (ovarian cyst, PID)**
-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



Vomiting and Diarrhea

- **Pearls**
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Document the mental status and vital signs prior to administration of antiemetic medications.
- Beware of vomiting only in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.
- 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.

Airway, Pediatric



Airway, Pediatric

Pearls

- **For this protocol, pediatric is defined as: < 12 years old AND [a] < 55 Kg -or- [b] Fits on Standardized Pediatric Length Based Tape**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Required for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of > 94% , it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol an adequate airway is when the patient is receiving appropriate oxygenation and ventilation without undue risk of aspiration or worsening airway pathology.**
- **An Intubation Attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Ventilatory rate are typically about 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.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- Paramedics should consider using 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 paperbag.
- BURP maneuver should be used to assist with difficult intubations. [Sellick s maneuver no longer recommended by AHA.]
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO2 (pCO2) of 30-35.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well. Manual stabilization of the endotracheal tube should be used during all patient moves/transfers.

Airway, Pediatric - Failed

Two (2) failed intubation attempts by most proficient technician on scene or anatomy inconsistent with intubation attempts. NO MORE THAN THREE (3) ATTEMPTS TOTAL

Inability to Oxygenate due to Upper Airway Compromise

NO → R Routine Airway Management and Transport R

YES

Inability to Oxygenate with BVM Oral / Nasopharyngeal Airway

NO → R BVM Ventilation R

YES

R Call For Assistance R

B Initiate Apneic Oxygenation B

Inability to Intubate Oral / Nasal Reposition, consider equipment change, BURP, bougie, Alternate Provider

NO → P ET Intubation and Transport P

YES

Inability to Oxygenate with BIAD

NO → B BIAD and Transport B

Emergent Transport

YES

M Notify Destination or Contact Medical Control M

Airway, Pediatric - Failed

Pearls

- If first intubation attempt fails, make an adjustment and then consider:
  - Different laryngoscope blade
  - Gum Elastic Bougie
  - Different ETT size
  - Change cricoid pressure
  - 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.
- **Ventilatory rate are typically about 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.**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- Notify **Medical Control** **AS EARLY AS POSSIBLE** about the patient's difficult / failed airway.

Pain Control: Pediatric

History
- Age
- Location
- Duration
- Severity (1 - 10)
- 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)**

Universal Patient Care Protocol

Patient care according to **Protocol** based on **Specific Complaint**

Pain Severity > 6 out of 10
Or
Indication for IV /IM Medication

R — **Obtain and Record Pulse Ox** — R

B — **Obtain and Record EtCO2 if available** — B

Vascular Access Protocol

A — Consider: **Nitrous Oxide** — A

P — **Morphine or Fentanyl ***
*** ONLY these doses may be administered PRIOR to OLMC contact [AGE > 5 Yrs]** — P

P — **Morphine* 0.1 mg/kg up to 5 mg. May repeat x 1 Q 5 minutes. Max Dose = 10 mg**

Fentanyl* 1 mcg/kg up to 50 mcg. May repeat x 1 Q 5 minutes. Max Dose = 100 mcg — P

P — Consider:
Ondansetron- 0.1mg/kg x1; max 4mg
Or
Promethazine - 0.5mg/kg x1; max 12.5 — P

B — Must reasssess patient at least **every 5 minutes** after sedative medication — B

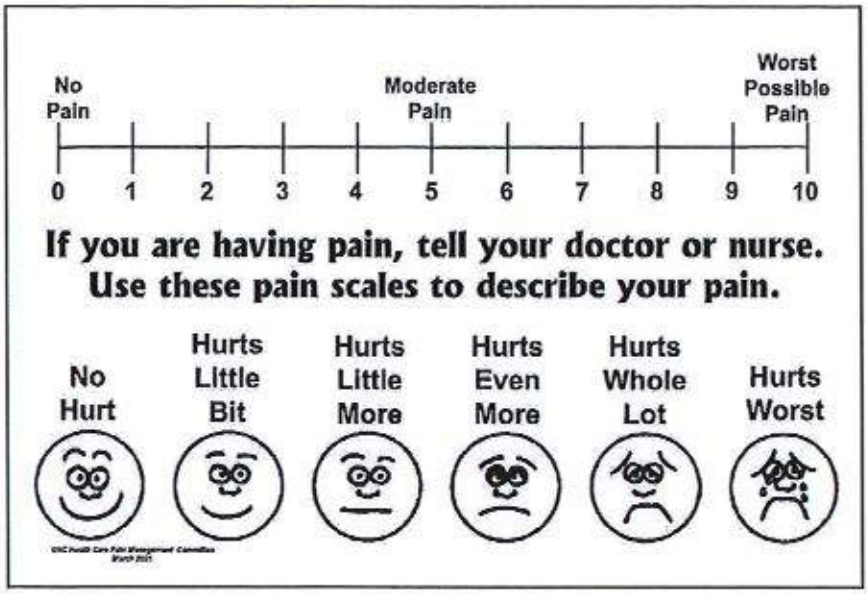
M — **Notify Destination or Contact Medical Control** — M

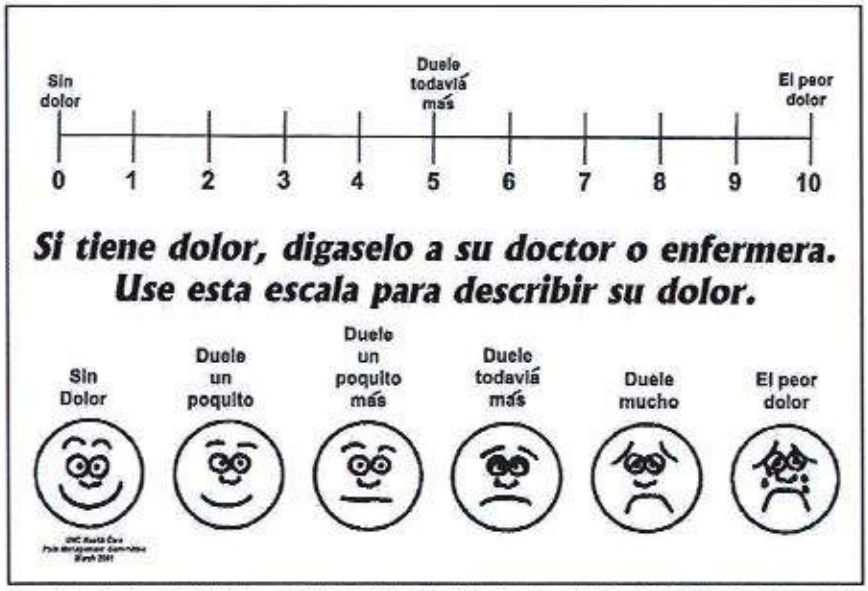
Morphine and Fentanyl Doses listed in this protocol may be used PRIOR to contact with OnLine Medical Control Age > 5 Years

Relative Contraindications For IV Pain Control:
- Severe Head Injury
- End-Stage Lung Disease
- Untreated Hypotension

Relative Contraindications For Non-Steroidal Agents :
- Active Bleeding
- Possible Surgery
- Renal Disease

Pain Control: Pediatric





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.

A physician's signature is required for any patient who receives pain medications.

Pearls

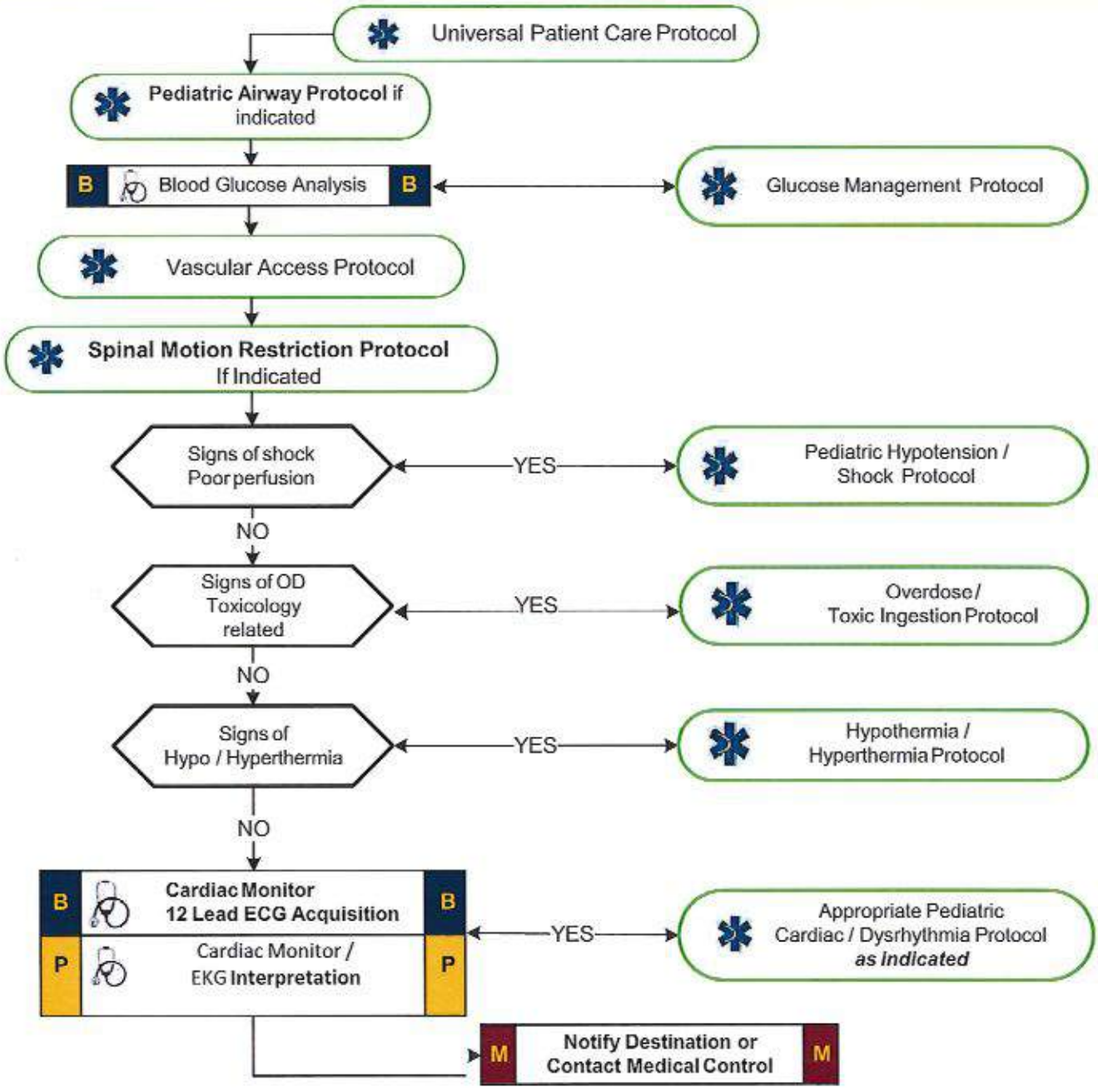
- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.**
- **Vital signs should be obtained pre, 15 minutes post, and at disposition with all pain medications.**
- Relative Contraindications to the use of a **narcotic** include hypotension, head injury, respiratory distress or severe Lung Disease.
- **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, or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- **Ibuprofen** should not be given for headaches or 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, headaches, or abdominal pain.

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
- Fever

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



Pediatric 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
- 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 Asystole / PEA

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, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Pediatric Pulseless Arrest Protocol

Criteria for Death / No Resuscitation Review DNR / POST Form

YES → Do not begin Resuscitation

Follow Deceased Subjects Policy

NO

R — Begin Continuous CPR Compressions — R
Push Hard / Push Fast
Change Compressors every 2 minutes
(*Limit changes / pulses checks seconds*)

Airway Protocol

Hypotension Protocol

Search for Reversible Causes
Utilize Appropriate Protocol

AT ANY TIME
Return of Spontaneous Circulation Go to Post Resuscitation Protocol

AT ANY TIME
If rhythm changes: Go to Appropriate Protocol

P — **Epinephrine 1:10,000** — P
0.01 mg/kg IV/IO (max 1mg)
Repeat every 3 – minutes

B — Blood Glucose Analysis — B

Glucose Management Protocol

P — Consider **Dopamine** 2-10mcg/kg/min or **Epinephrine** 2-10mcg/min — P

Consider Chest Needle Decompression Procedure

M — **Notify Destination or Contact Medical Control** — M

REVERSIBLE CAUSES:

Hypovolemia
Hypotension Protocol – Fluid Bolus

Hypoxia
Airway Protocol – Obstruction? Increase ventilation, Supplemental Oxygen

Hydrogen ion (acidosis) Increase ventilation, Bicarbonate

Hypothermia
Hypothermia Protocol, Rewarming

Hyperkalemia
Dialysis / Renal Failure Protocol – Calcium, Bicarbonate, Albuterol

Hypoglycemia
Hypoglycemia Protocol – Dextrose, Glucagon

Tension pneumothorax
Chest Decompression

Tamponade; cardiac
Rapid Transport – Early Notification

Toxins
OD / Toxic Ingestion Protocol; Specific Antidote

Thrombosis; pulmonary (PE)
Fluid Bolus. Rapid Transport – Early Notification

Thrombosis; coronary (MI)
Rapid Transport – Early Notification

Pediatric Asystole / PEA

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
MCG/KG/MIN 2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
MCG/KG/MIN 5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
MCG/KG/MIN 10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
MCG/KG/MIN 15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
MCG/KG/MIN 20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Epinephrine Drip Chart

Ensure you have 8mcg/ml Concentration for this chart - Mix 2mg Epi 1:1,00 in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

	gtts/min
MCG/MIN 2 mcg	15
MCG/MIN 4 mcg	30
MCG/MIN 6 mcg	45
MCG/MIN 8 mcg	60
MCG/MIN 10 mcg	75

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.

Pediatric Bradycardia

History
- Past medical history
- Foreign body exposure/swallowed
- 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, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

AT ANY TIME
Pulseless
Go To Pediatric Cardiac Arrest Protocol

Universal Patient Care Protocol

Pediatric Airway Protocol

B — Cardiac Monitor / 12 Lead ECG Acquisition — B

P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Poor Perfusion / Decreased Blood Pressure
Respiratory Insufficiency

NO → **Monitor & Reassess**

YES ↓

Vascular Access Protocol

Hypotension Protocol

R — Heart Rate < 60 in Infant **CPR** — R

P — **Epinephrine 1:10,000** See Broselow tape — P

P — Consider **Atropine** See Broselow tape — P

Consider Reversible Causes

Hypovolemia
Hypotension Protocol – Fluid Bolus

REVERSIBLE CAUSES:

Hypoxia
Airway Protocol – Obstruction? Increase ventilation, Supplemental Oxygen

Hydrogen ion (acidosis)
Increase ventilation, Bicarbonate

Hypothermia
Hypothermia Protocol, Rewarming

Hyperkalemia
Dialysis / Renal Failure Protocol – Calcium, Bicarbonate, Albuterol

Hypoglycemia
Hypoglycemia Protocol – Dextrose, Glucagon

Tension pneumothorax
Chest Decompression

Tamponade; cardiac
Rapid Transport – Early Notification

Toxins
OD / Toxic Ingestion Protocol; Specific Antidote

Thrombosis; pulmonary (PE)
Fluid Bolus.
Rapid Transport – Early Notification

Thrombosis; coronary (MI)
Rapid Transport – Early Notification

P — Consider **Dopamine** 2-10mcg/kg/min or **Epinephrine** 2-10mcg/min — P

P — **Consider External Pacing** Set rate to 100 bpm — P

M — **Notify Destination or Contact Medical Control** — M

Pediatric Bradycardia

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/KG/MIN	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Epinephrine Drip Chart

Ensure you have 8mcg/ml Concentration for this chart - Mix 2mg Epi 1:1,00 in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/MIN	gtts/min
2 mcg	15
4 mcg	30
6 mcg	45
8 mcg	60
10 mcg	75

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Age/Weight/Length based system to accurately calculate drug dosages and equipment**
- Infant = < 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 Cardiac Arrest

Histor
- y 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

Universal Patient Care Protocol

Criteria for Death / No Resuscitation

Yes → Withhold resuscitation

M Contact / Notify Medical Control or Supervisor** M

No

Begin Continuous CPR Compressions

ALS Available ?

NO

R AED R

Go To Airway Protocol

Interrupt Compressions Only as per AED Procedure. Ventilate to maintain EtCO2 of 10 mmHG during CPR.

YES

P Assess Rhythm P

Go To Age Appropriate Protocol:
Ventricular Fibrillation
Pulseless Ventricular Tachycardia
Pulseless Electrical Activity
Asystole

AT ANY TIME
Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Pediatric Cardiac Arrest

Hypovolemia
Hypotension Protocol – Fluid Bolus

Hypoxia
Airway Protocol – Obstruction? Increase ventilation, Supplemental Oxygen

Hydrogen ion (acidosis)
Increase ventilation, Bicarbonate

Hypothermia
Hypothermia Protocol, Rewarming

Hyperkalemia
Dialysis / Renal Failure Protocol – Calcium, Bicarbonate, Albuterol

Hypoglycemia
Hypoglycemia Protocol – Dextrose, Glucagon

Tension pneumothorax
Chest Decompression

Tamponade; cardiac
Rapid Transport – Early Notification

Toxins
OD / Toxic Ingestion Protocol;
Specific Antidote

Thrombosis; pulmonary (PE)
Fluid Bolus.
Rapid Transport – Early Notification

Thrombosis; coronary (MI)
Rapid Transport – Early Notification

Pearls

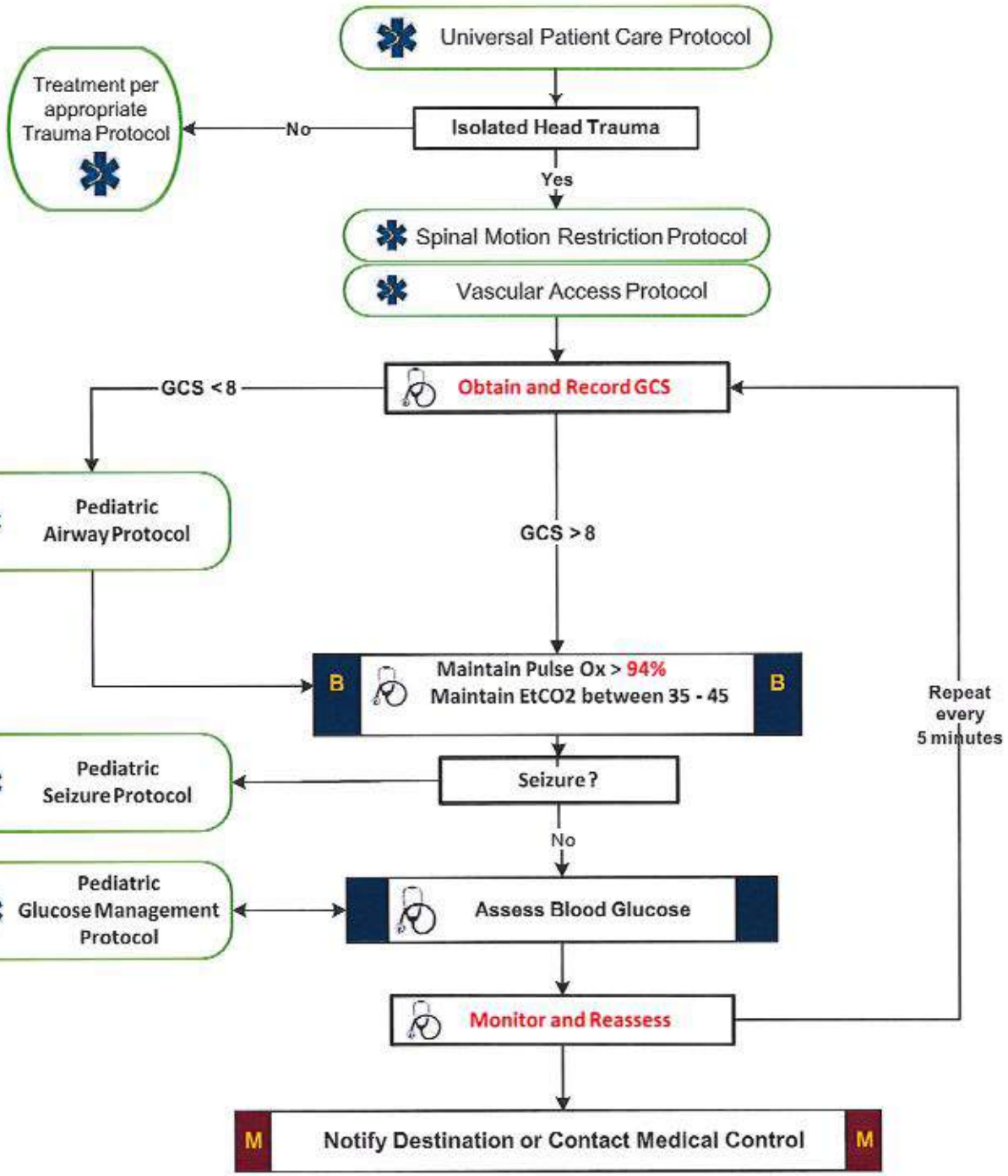
- **Recommended Exam: Mental Status, Heart, Lungs**
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Airway is the most important intervention. This should be accomplished immediately. Patient survival is often dependent on airway management success.

Pediatric Head Trauma

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

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

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



Pediatric Head Trauma

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury.
- The most important item to monitor and document is a change in the level of consciousness.
- Concussions are periods of confusion or LOC associated with trauma which may have resolved by the time EMS arrives. 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.

Pediatric Hypotension

History
- Blood loss
- Fluid loss
  - Vomiting
  - Diarrhea
  - Fever
- Infection
- Congenital Defects
- Birth Complications

Signs and Symptoms
- Restlessness, confusion, weakness
- Dizziness
- Increased HR, rapid pulse
- Decreased BP
- Pale, cool, clammy skin
- Delayed capillary refill

Differential
- Trauma
- Infection
- Dehydration
  - Vomiting
  - Diarrhea
  - Fever
- Congenital heart disease
- Medication or Toxin
- Allergic reaction

Universal Patient Care Protocol
Use Age Appropriate B/P Levels

Vascular Access Protocol

Evidence or History of Trauma ? — Yes → Pediatric Multiple Trauma Protocol

No

B — Assess Blood Glucose — B ↔ Glucose Management Protocol

A — **Normal Saline Bolus 20 mL/Kg**
May repeat 3x max cumulative dose of 60 ml/kg — A

P — Consider:
Dopamine
2-10mcg/kg/min
Or
Epinephrine
2-10mcg/min — P

Consider OD / Toxic Protocol

M — Notify Destination or Contact Medical Control — M

Age Appropriate Vital Signs:

	SBP	HR
Premature	55-75	120-170
0-3 m	65-85	100-150
3-6m	70-90	90-120
6-12m	80-100	80-120
1-3Y	90-105	70-110
3-6Y	95-110	65-110
6-12Y	100-120	60-95

Pediatric Hypotension

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
MCG/KG/MIN 2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Epinephrine Drip Chart

Ensure you have 8mcg/ml Concentration for this chart - Mix 2mg Epi 1:1,00 in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

	gtts/min
MCG/MIN 2 mcg	15
4 mcg	30
6 mcg	45
8 mcg	60
10 mcg	75

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- Consider all possible causes of shock and treat per appropriate protocol.
- Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.
- Most maternal medications pass through breast milk to the infant. Examples: Narcotics, Benzodiazepines.
- Consider possible allergic reaction or early anaphylaxis.
- Consider sepsis as possible etiology and measure a body temperature as part of vital signs.
- If patient has a history of cardiac disease, (prematurity) chronic lung disease, or renal disease limit Normal Saline bolus to 10 ml/kg unless otherwise directed by Medical Control Physician

Pediatric Multiple Trauma

History
- Time and mechanism of injury
- Height of any fall
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / Protective equipment
  - Car Seat / Helmet / Pads Ejection
- Past medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status
- Unconscious
- Hypotension or shock
- Cardiac/Respiratory 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

Universal Patient Care Protocol

Assessment of Serious Signs / Symptoms
ABC and LOC

Spinal Motion Restriction Protocol

Pediatric Airway Protocol

Vascular Access Protocol

R — VS / Perfusion / GCS — R

ABNORMAL

Rapid Transport to appropriate destination using **EMS System Trauma Plan**
Limit Scene Time to 10 minutes
Provide Early Notification

B — Cardiac Monitor / 12 Lead EKG **Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

Hypotension Protocol

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

P — Consider **Chest Decompression**
Needle Procedure if indicated — P

Pediatric Head Injury Protocol if indicated

Monitor and Reassess

NORMAL

Repeat Assessment

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

Transport to appropriate destination using **EMS System Trauma Plan**

R — **Monitor and Reassess** — R

Pediatric Pain Protocol

M — **Notify Destination or Contact Medical Control** — M

Pediatric 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.**
- Mechanism is the most reliable indicator of serious injury. Examine all restraints / protective equipment for damage.
- In prolonged extrications or serious trauma consider air transportation for extended transport times.
- Do not overlook the possibility for child abuse.
- Scene times should not be delayed for procedures. These should be performed en route when possible.
- Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained above 90%.

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

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

B Cardiac Monitor / 12 Lead ECG Acquisition B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

R Repeat Primary Assessment R

B Optimize Ventilation and Oxygenation Maintain SpO2 94% B

Pediatric Airway Protocol

B Remove Impedence Threshold Device
EtCO2: 35 – 45 mmHg
DO NOT HYPERVENTILATE
Monitor Vital Signs / Reassess B

Vascular Access Protocol

Hypotension Age based ?
- YES → **Hypotension Protocol**

B Blood Glucose Assessment B ↔ **Pediatric Glucose Management Protocol**

Symptomatic Bradycardia ?
- YES → **Pediatric Bradycardia Protocol**
- NO ↓

Symptomatic Tachycardia ?
- YES → **Pediatric Tachycardia Protocol**
- NO ↓

Persistent ectopy?
- YES ↓
  - P Continue **Antiarrhythmic** Utilized for ROSC P ↓
  - P **Consider Sedation** See Broselow Tape P
- NO ↓

M **Notify Destination or Contact Medical Control** M

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.
- **Consider use of Impedance Threshold Device once Advanced Airway is Placed.**
- **REMOVE Impedance Threshold Device once ROSC obtained**
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

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

Universal Patient Care Protocol

B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B

P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Airway Patent
Ventilations adequate
Oxygenation adequate
— NO → **Pediatric Airway Protocol**

YES

Allergic Reaction
Anaphylaxis
— YES → **Allergic Reaction / Anaphylaxis Protocol**

NO

Vascular Access Protocol

B — Position child with Head of bed in up-position (25-40°) Flex hips with support under knees so that they are bent 90° — B

Transport to a Pediatric Specialty Center ***if available***

M — **Notify Destination or Contact Medical Control** — M

***OLMC**

P — Consider: if available **CPAP / BiPAP** — P

M — Consider: **Diuretics** **Inotropic Agents** — M

OLMC* = Online Medical Control

Pediatric Pulmonary Edema / CHF

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.
  - – 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 should include consultation with Control:**
- 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 Respiratory Distress

History
- Time of onset
- Possibility of foreign body
- Medical history
- Medications
- Fever or respiratory infection
- Other sick siblings / contacts
- History of trauma

Signs and Symptoms
- Wheezing or stridor
- Respiratory retractions
- Increased heartrate
- Altered level of consciousness
- Nasal flaring / tripoding
- Anxious appearance

Differential
- **Allergic Reaction**
- **Asthma**
- **Aspiration**
- **Foreign body**
- **Infection**
  - **Pneumonia**
  - **Croup**
  - **Epiglotitis**
- **Congenital heart disease**
- **Medication or Toxin**
- **Trauma**

Universal Patient Care Protocol

Respiratory / Ventilatory Insufficiency

YES → Airway Management Protocol

NO

Position Patient for Comfort

R — Pulse Oximetry — R

B — Capnography if Available — B

Consider Pediatric CHF Protocol

Wheezing

B — **Albuterol** 2.5mg — B

Vascular Access Protocol
If SpO2 < 94% after 1st treatment

B — If no improvement repeat **Albuterol** 2.5mg x 2 — B

P — Consider **Albuterol** or other **Beta- Agonist** with **Ipratropium** if available 0.5mg **ipratropium bromide** + 2.5mg **albuterol** sulfate — P

B — Consider CPAP/BiPAP if available — B

Stridor

B — Normal Saline *Nebulized* — B

P — If NO improvement or Severe **Racemic Epinephrine Nebulized** 0.5-0.75ml of 2.25% solution in 2.0ml normal saline — P

Vascular Access Protocol
If SpO2 < 94% after 1st treatment

M — **Notify Destination or Contact Medical Control** — M

OLMC*

B — Consider Repeat **Albuterol** or other **Beta Agonist** — B

P — If NO improvement repeat **Racemic Epinephrine Nebulized** — P

Consider Anaphylaxis Protocol

Consider Anaphylaxis Protocol

OLMC* = Online Medical Control

Pediatric Respiratory Distress

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Racemic EPINEPHrine should be diluted** with 2mls of normal saline prior to administration.
- Do not force a child into a position. 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 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.
- Avoid direct laryngoscopy unless intubation is imminent.

Pediatric Seizure

History
- Fever
- Prior history of seizures
- Seizure medications
- Reported seizure activity
- History of recent head trauma
- Congenital abnormality
- Consider pregnancy in teenage female

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

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

* For Actively seizing Patients on EMS arrival (i.e. without IV) consider **IM / IN** **Midazolam** (see chart)

Universal Patient Care Protocol

Peds Airway Protocol

B Assess Blood Glucose B ↔ Glucose Management Protocol

Evidence of Trauma ? **Pediatric Head Injury Protocol**

Actively Seizing / **Post-Ictal**

Vascular Access Protocol

P Consider **Benzodiazepines** **Midazolam** (see chart on next page) Or See Broselow tape P

May repeat x1 after 5 min.

Still Seizing ? YES → M **Notify Destination or Contact Medical Control** M

NO

R Obtain Temperature R → **AFEBRILE** → M

R Obtain Temperature R → **FEBRILE** → Vascular Access Protocol

R Obtain Temperature R → **FEBRILE** → Cooling Measures R

Seizure Recurs ? YES → Vascular Access Protocol

NO → M

Pediatric Seizure

Midazolam IV/ IO/ IM/ IN

Weight	Grey	Pink	Red	Purple	Yellow	White	Blue	Orange	Green	Other	Other
kg	3-5	6-7	8-9	10-11	12-14	15-18	19-22	24-28	30-36	40	45
Lbs.	6-11	13-15	17-20	22-25	27-31	33-40	42-49	53-62	65-80	90	100
IV/ IO/ IM (Intravenous / Intraosseous / Intramuscular)											
0.1mg/kg Dose	0.4 mg	0.65 mg	0.85 mg	1 mg	1.25 mg	1.75 mg	2 mg	2.5 mg	3.3 mg	4 mg	4.5mg
0.1mg/kg Volume	0.8 ml	0.13 ml	0.17 ml	0.2 ml	0.25 ml	0.35 ml	0.4 ml	0.5 ml	0.65 ml	0.8 ml	0.9 ml
IN (Intranasal)											
0.2mg/kg Dose	0.75 mg	1.25 mg	1.75 mg	2 mg	2.5 mg	3.5 mg	4 mg	5 mg	5 mg	5 mg	5 mg
0.2mg/kg Volume	0.15 ml	0.25 ml	0.35 ml	0.4 ml	0.5 ml	0.7 ml	0.8 ml	1 ml	1 ml	1 ml	1 ml

USE A 1 ML SYRINGE FOR MIDAZOLAM ADMISTRATION IN PEDIATRIC PATIENTS

Pearls

❖ May give initial dose of Midazolam and repeat once. If a second Benzodiazepine is available then initial dose of that one can be given. If seizing continues and another dose is needed contact medical control.

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- May give initial dose of Midazolam and repeat dose, then initial dose of second Benzodiazepine.
- **Addressing the ABCs and verifying blood glucose is more important than stopping the seizure**
- **Avoiding hypoxemia is extremely important**
- **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)** effect only a part of the body and do not usually result in a loss of consciousness.
- **Jacksonian seizures** are seizures which start as a focal seizure and become generalized.
- Be prepared to assist ventilations especially if a benzodiazepine is used.
- If evidence or suspicion of trauma, spine should be immobilized.
- In an infant, a seizure may be the only evidence of a closed head injury.
- **Rectal Diazepam/Lorazepam:** Draw drug dose up in a 3 ml syringe. Remove needle from syringe and attached syringe to an IV extension tube. Cut off the distal end of the extension tube leaving about 3 or 4 inches of length. Insert tube in rectum and inject drug. Flush extension tube with 3 ml of air and remove.
- * D10 used in Newborn/Infant and D25 used in Pediatric

Pediatric Tachycardias
(With A Pulse)

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

Universal Patient Care Protocol

B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B

P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Vascular Access Protocol

Unstable / Serious Signs & Symptoms — YES → P — Cardioversion Procedure — P; P — Consider **Pre-Shock Benzodiazepines** See Color Based Tape — P

NO

QRS > 0.08 secs ? — YES

NO

HR < 220 Infant
HR < 180 Child
P wave Present
HR Variable

YES → **Probable Sinus Tachycardia** → Identify & Treat Underlying Cause → Exit to Appropriate Protocol

NO → **Probable SVT** → P — Vagal Maneuvers — P; P — Consider **Adenosine** See Color Based Tape — P → P — Consider **Antiarrhythmics** See Color Based Tape — P

P — Consider **Adenosine*** **[Regular Monomorphic Rhythm Only]** See Color Based Tape — P

P — Consider **Antiarrhythmics** See Color Based Tape — P

B — **Rhythm Converts** 12 Lead ECG Acquisition — B

M — **Notify Destination or Contact Medical Control** — M

AT ANY TIME
Pulseless
Go To Pediatric Cardiac Arrest Protocol

Single lead ECG able to diagnose and treat arrhythmia 12 Lead ECG not necessary to diagnose and treat, but preferred when patient stable

Pediatric Tachycardias
(With A Pulse)

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 <0.12 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 <0.12 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 (> 0.08 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 Benzodiazepines are used.
- 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.
- * Adenosine should NOT be given for unstable or for irregular or for polymorphic wide-complex tachycardias as it may cause degeneration of the arrhythmia to Ventricular Fibrillation.

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

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

R **Continuous CPR Compressions** R
Push Hard/Push Fast
Change Compressors every 2 minutes
(Limits changes / pulse checks
Seconds)

P **Defibrillate x 1** P
See Color Based Tape

Airway Protocol

B Cardiac Monitor / Rhythm **Acquisition** B

Vascular Access Protocol

Check Rhythm and Pulse

P **Defibrillate x 1** P
See Color Based Tape

5 Cycles of CPR

P **Epinephrine** P
(May repeat Q 3 – minutes)
See Color Based Tape

After 5 Cycles of CPR Check Rhythm and Pulse

Defibrillate x 1
See Color Based Tape

5 Cycles of CPR

Consider Anti-Arrhythmic:
See Color Based Tape

5 Cycles of CPR

P **Consider Torsades de pointes** P
Magnesium Sulfate
See Color Based Tape

AT ANY TIME
Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Criteria For Discontinuation?

NO → M **Notify Destination Or Contact Medical Control** M

YES → **STOP RESUSCITATION**

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls

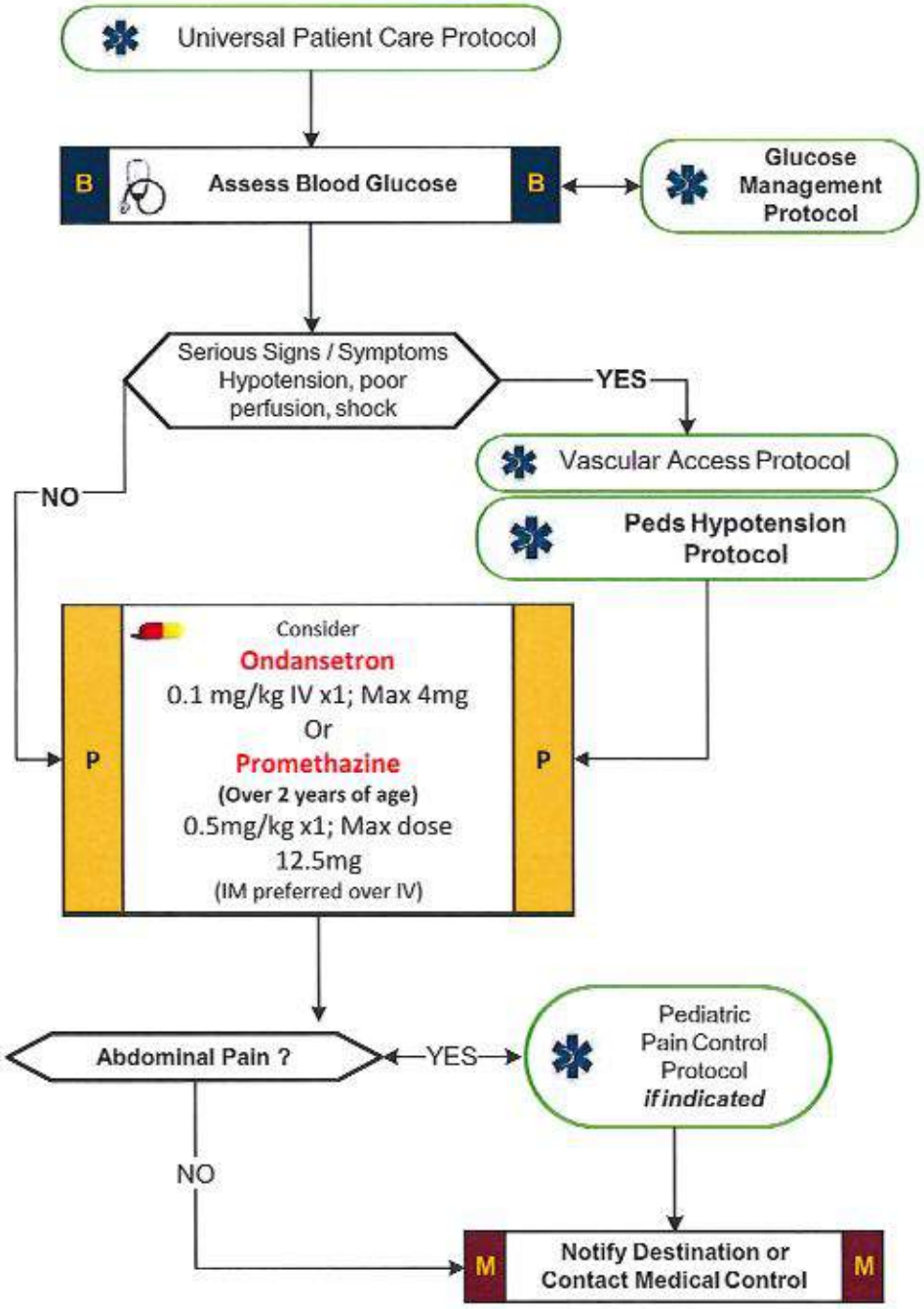
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 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.

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 Vomiting / Diarrhea

Pearls

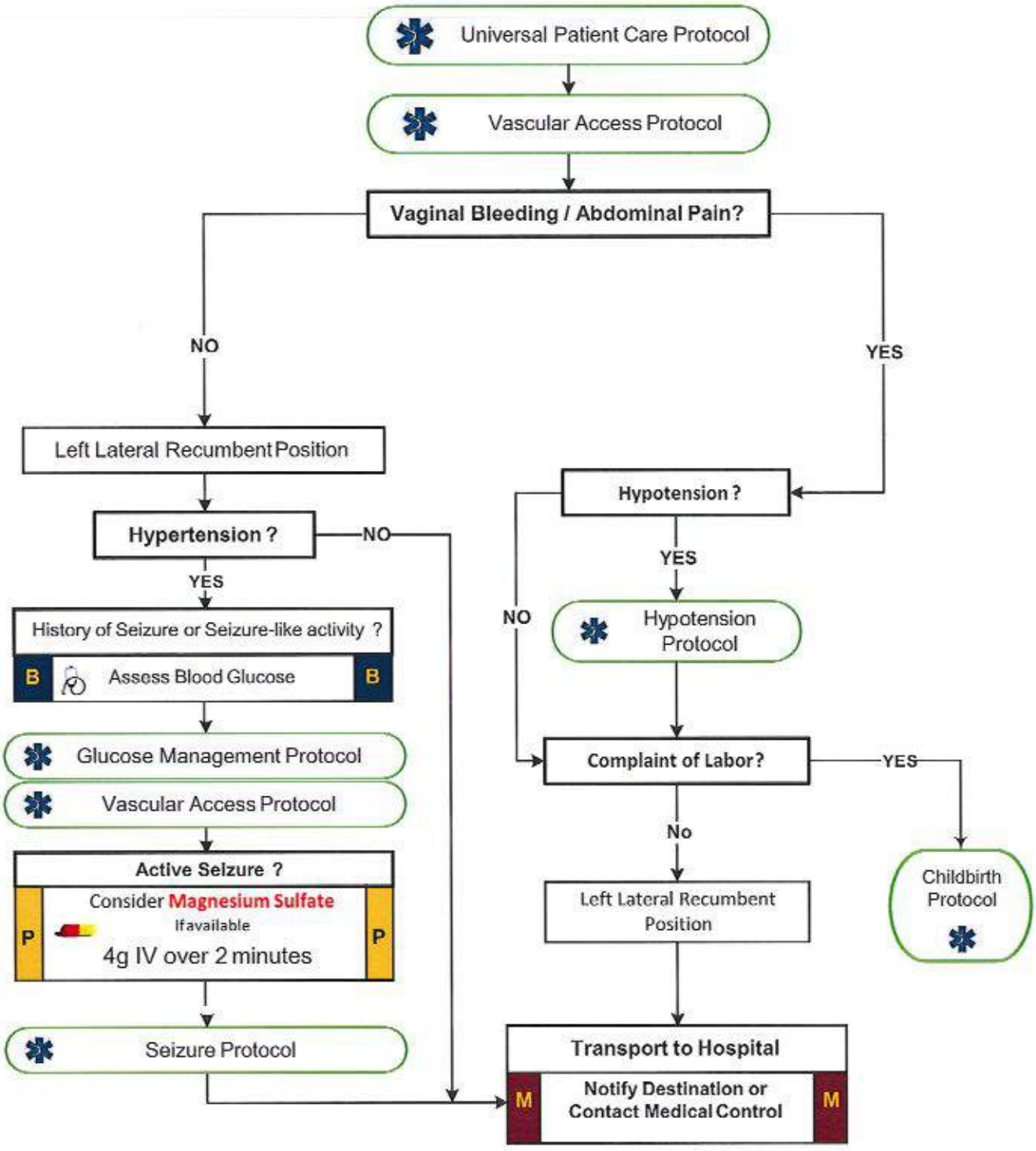
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.**
- **Age specific blood pressure 0 – 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.

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**
- **Ectopic Pregnancy**



Obstetrical Emergency

Pearls

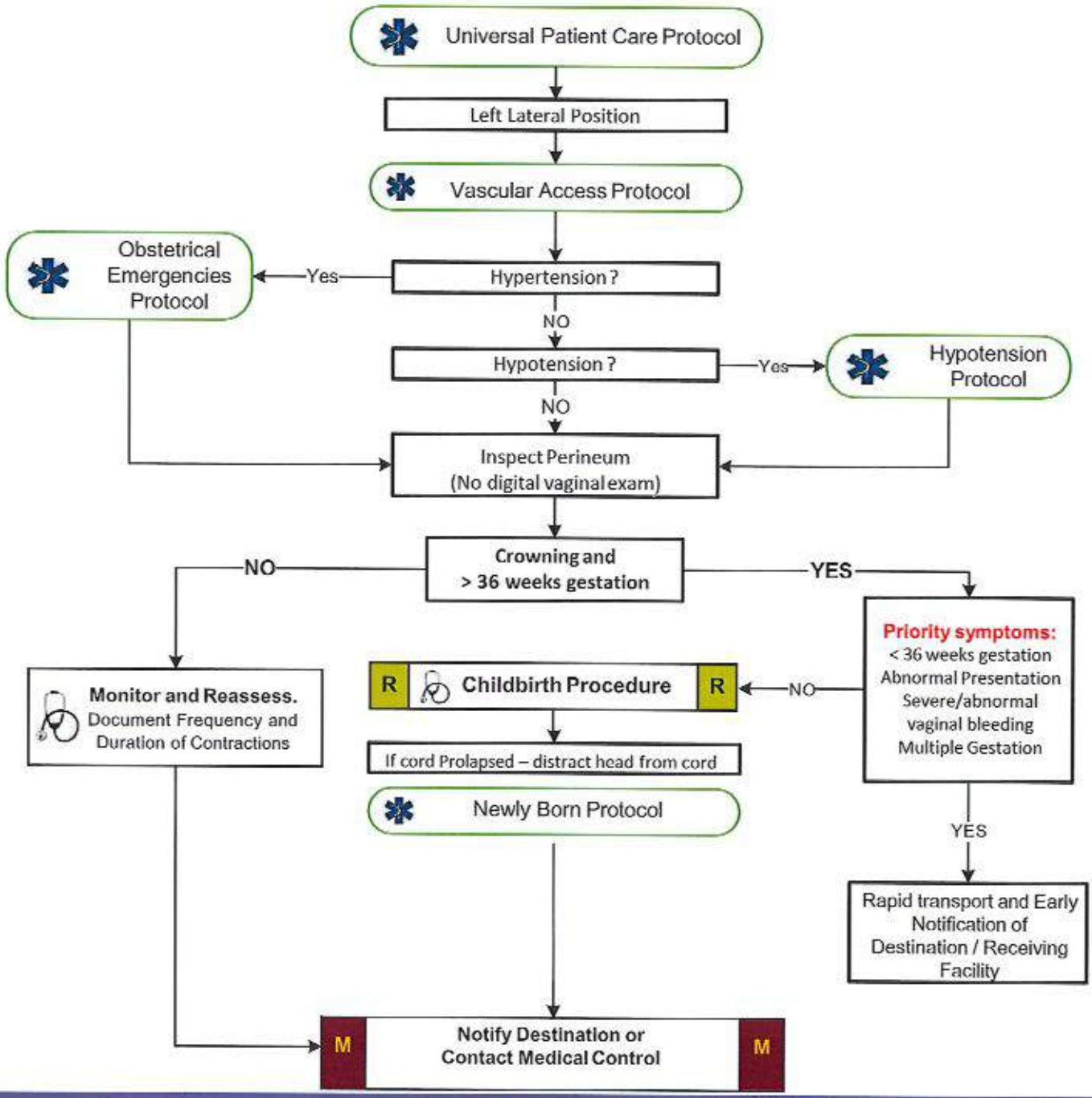
- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- Severe headache, vision changes, hypertension or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 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 .
- **Magnesium** may cause hypotension and decreased respiratory drive. **Use with caution.**

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
- Illicit Drug Use

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

APGAR SCORE

	Score = 0	Score = 1	Score = 2	Totals
Appearance Skin Color	Blue or Pale all over	Blue at extremities Body pink (acrocyanosis)	Body and Extremities Pink	
Pulse Rate	Absent	< 100 BPM	100 BPM +	
Reflex irritability **G**rimace	No Response to Stimulation	Grimace on Suction or Aggressive Stimulation	Cry with Stimulation	
Activity	None	Some Flexion	Flexed Arms and Legs – resist extension	
Respiratory Effort	Absent	Weak, Irregular, Gasping	Strong, Robust Cry	

- Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
- Support the infant's head as needed.
- Check for 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.
- Suction the airway with a bulb syringe. **(Mouth first then Nose)**
- Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
- Gently pull up on the head to allow delivery of the posterior shoulder.
- Slowly deliver the remainder of the infant.
- Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the
- clamps.
- Record APGAR scores at 1 and 5 minutes.
- Follow the **Newly Born Protocol** for further treatment.
- The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
- Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.

Continue transport to the hospital after delivery.

Complications:

- **Prolapsed Cord**
  - Don't reinsert cord
  - With 2 gloved fingers lift the baby off of the cord if circulation is comprised.
  - If able have mother in the knee to chest position.
  - Saline soaked dressings applied to the cord for extended delivery time
- **Breech Presentation**
  - Do not pull. If the head doesn't deliver make a V with your gloved fingers to provide an airway for the infant. **(Rapid Transport)**
- **Shoulder Dystonia**
  - Do Not force delivery
  - Have mother flex thighs up to relieve pressure

  (Rapid Transport)

Pearls

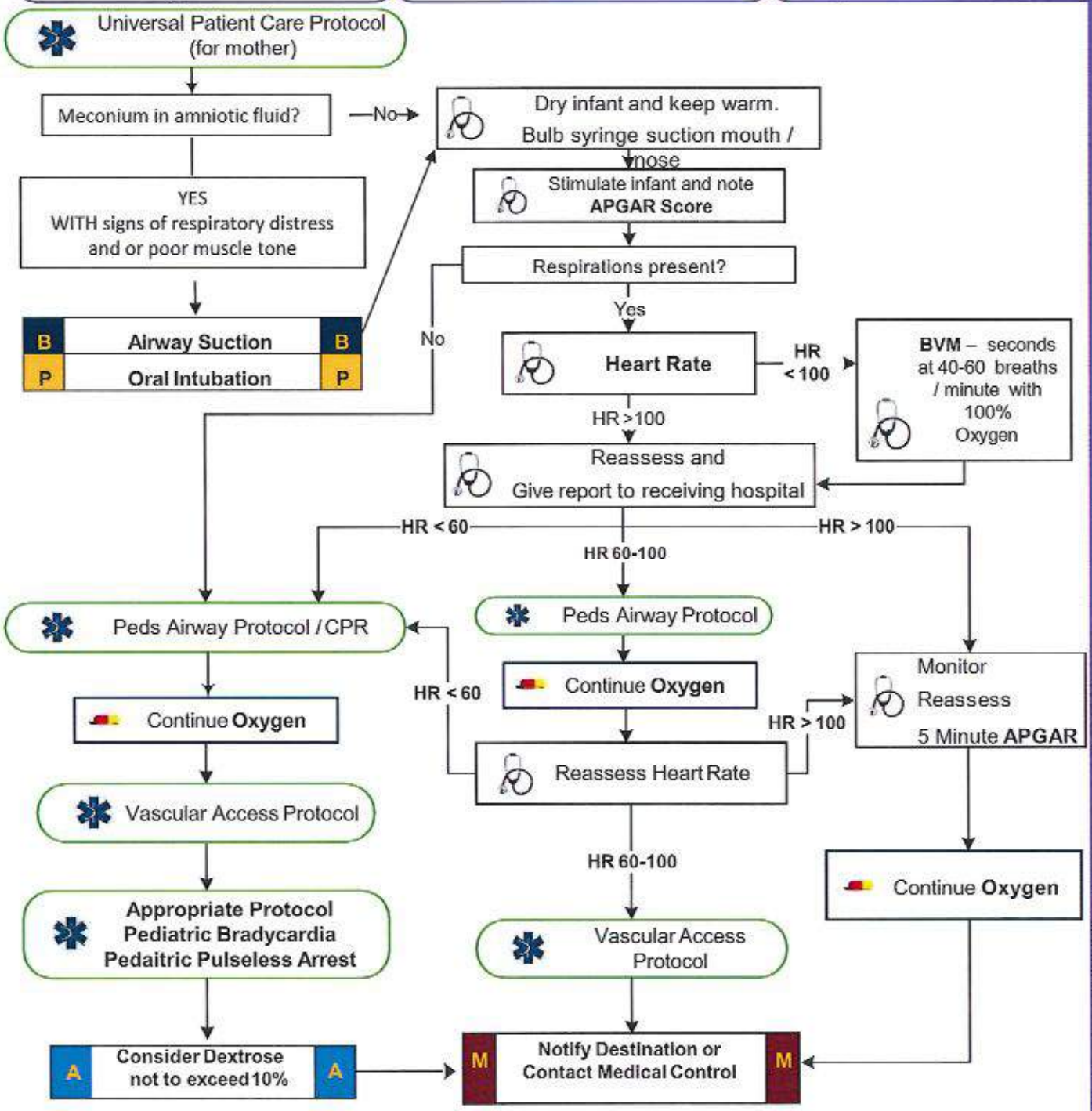
- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
- Document all times (delivery, contraction frequency, and length).
- If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control postpartum 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. (APGAR = Appendix C)

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**



Newly Born

APGAR SCORE

	Score = 0	Score = 1	Score = 2	Totals
Appearance Skin Color	Blue or Pale all over	Blue at extremities Body pink (acrocyanosis)	Body and Extremities Pink	
Pulse Rate	Absent	< 100 BPM	100 BPM +	
Reflex irritability Grimace	No Response to Stimulation	Grimace on Suction or Aggressive Stimulation	Cry with Stimulation	
Activity	None	Some Flexion	Flexed Arms and Legs – resist extension	
Respiratory Effort	Absent	Weak, Irregular, Gasping	Strong, Robust Cry	

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- CPR in newborn is 120 compressions/minute with a 3:1 compressionto ventilation ratio
- It is extremely important to keep infant warm.
- Maternal sedation or narcotics will sedate infant.
- Consider hypoglycemia in infant.
- Document 1 and 5 minute APGAR in PCR (APGAR = Appendix C)
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)

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

Accidental / Intentional Explosions (See Pearls)

Triage Protocol

Thermal / Chemical / Electrical Burn or Exposure — YES → Age Appropriate Thermal Burn / Chemical and Electrical Burn Protocol

Radiation Burn or Exposure — YES → Radiation Incident Protocol

Crush Injury — YES → Crush Syndrome Trauma Protocol

Age appropriate **Multiple Trauma Protocol** if indicated

Age appropriate **Airway Protocol** if indicated

Vascular Access Protocol

P — Cardiac Monitor / 12 Lead ECG **Interpretation** **If indicated** — P

Blast Lung Injury — YES → Maintain Oxygen Saturation

Age appropriate **Pain Control Protocol** if indicated

Age appropriate **Airway Protocol** if indicated

Rapid Transport to appropriate destination using **Trauma and Burn: EMS Triage and Destination Plan**

M — **Notify Destination or Contact Medical Control** — M

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 Triaged 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 particalization 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 particalization 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.

Burns: Thermal

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
- singed facial or nasal hair
- Hoarseness / wheezing

Differential
- **Superficial (1-Degree)** red and painful
- **Partial Thickness (2-Degree)** blistered or leathery skin
- **Full Thickness (3-Degree)** painless/
- **Thermal**
- **Chemical**
- **Electrical**
- **Radiation**

Initial Actions AFTER determining SCENE SAFE is to STOP THE BURN !

Universal Patient Care Protocol

Consider CO / Cyanide Poisoning → Yes → **Carbon Monoxide / Cyanide Poisoning Protocol**

Airway Protocol

When Trauma coexists in the Burn Patient – initial transport to a verified Trauma Center based on the Trauma Triage and Bypass Protocol is warranted.

Remove rings, bracelets, and other constricting items

Cover burn with dry sterile sheet or dressing

Vascular Access Protocol

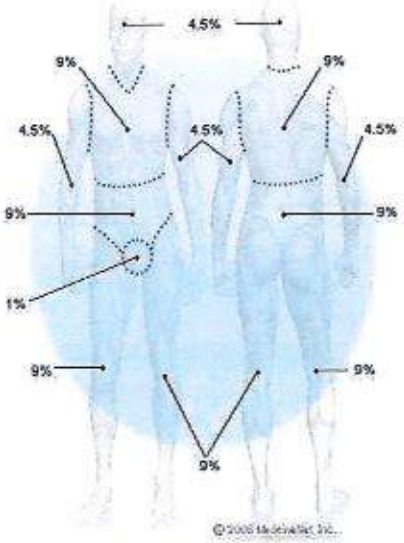
A — IV Normal Saline 0.25 x Kg body Wgt x % TBSA /Hr for up to first 8 Hrs. (More info on next page). — A

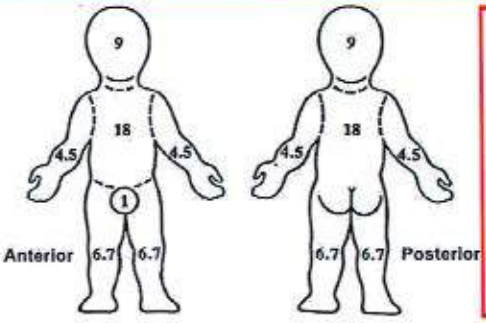
Pain Control Protocol

M — **Notify Destination or Contact Medical Control** — M

Burns: Thermal

Burn Percentage in Adults: Rule of Nines





Parkland Formula

Volume of Ringer's lactate = 4 mL x % BSA x weight (kg)

½ → First 8 hours

½ → Next 16 hours

1. The IV solution should be changed to Lactated Ringers if it is available. It is preferred over Normal Saline.

2. Formula example and a rule of thumb is; an 80 kg patient with 50% TBSA will need 1000 cc of fluid per hour.

- **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.***

(These burns will require direct transport to a burn center, or transfer once seen at a local facility where the patient can be stabilized with interventions such as airway management or pain relief if this is not available in the field or the distance to a Burn Center is significant.)

Critical (Red)

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

Serious (Yellow)

5-15% TBSA 2nd/3rd Degree Burn Suspected Inhalation injury or requiring intubation for airway stabilization Hypotension or GCS < 14 (When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Minor (Green)

< 5% TBSA 2nd/3rd Degree Burn No Inhalation Injury, Not Intubated, Normotensive GCS>14 (Transport to the Local Hospital)

Pearls

- Burn patients are Trauma Patients, evaluate for multisystem trauma.
- **When Trauma coexists in the Burn Patient – initial transport to a verified Trauma Center based on the Trauma Triage and Bypass Protocol is warranted.**
- Assure whatever has caused the burn, is no longer contacting the injury. (Stop the burning process!)
- Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro
- Early intubation is required when the patient experiences significant inhalation injuries.
- Potential CO exposure should be treated with 100% oxygen. (For patients suffering from CO inhalation, transport to a hospital equipped with a hyperbaric chamber is indicated [when reasonably accessible].)
- 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 burns, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.

Chemical and Electrical Burns

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.

Initial Actions AFTER determining SCENE SAFE is to STOP THE BURN !

Universal Patient Care Protocol

Assess Burn Type
Concomitant Injury Severity

CHEMICAL BURN

R Brush off any DRY Chemical R

R Irrigate copiously for **AT LEAST** 15 minutes R

Consider Airway Protocol

ELECTRICAL BURN

Remove metal objects

Consider Spinal Motion Restriction Protocol

Consider Trauma Protocol

B Cardiac Monitor / 12 Lead ECG Acquisition B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

R Identify Contact Points R

Consider Vascular Access Protocol

Consider Pain Control Protocol

R Cover burns with Dry Sterile Dressings R

M **Notify Destination or Contact Medical Control** M

When Trauma coexists in the Burn Patient – initial transport to a verified Trauma Center based on the Trauma Triage and Bypass Protocol is warranted.

Age Appropriate **Cardiac Arrest / Pulseless Arrest / Arrhythmia Protocol(s)** *as indicated*

Chemical and Electrical Burns

Critical (Red)

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

Serious (Yellow)

5-15% TBSA 2nd/3rd Degree Burn
Suspected Inhalation Injury or requiring intubation for airway stabilization
Hypotension or GCS <14
(When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Minor (Green)

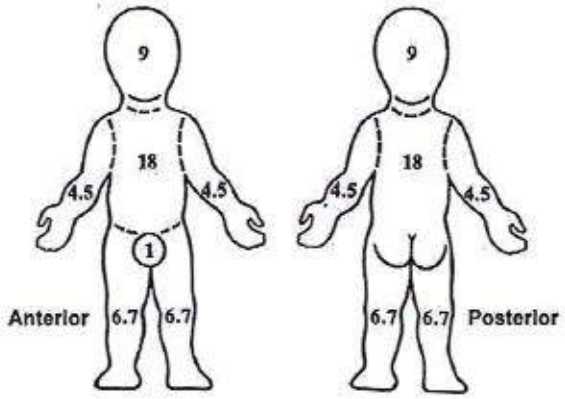
< 5% TBSA 2nd/3rd Degree Burn No inhalation injury, Not Intubated, Normotensive GCS>14
(Transport to the Local Hospital)

Parkland Formula

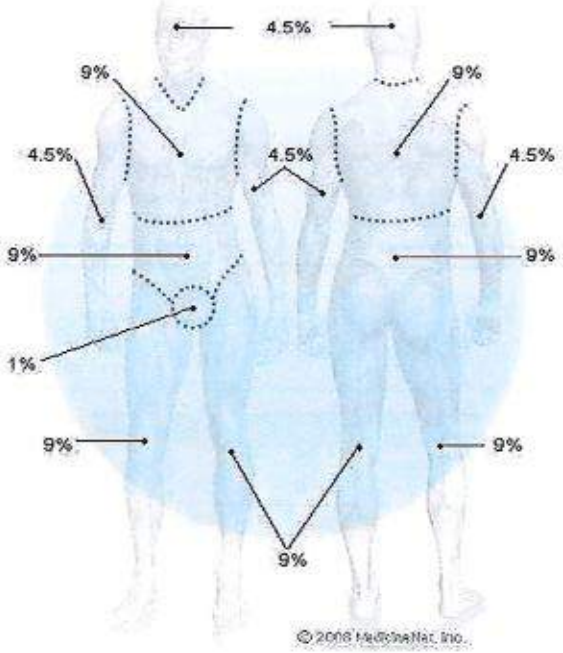
Volume of Ringer's lactate = 4 mL x % BSA x weight (kg)

½ → First 8 hours

½ → Next 16 hours



Burn Percentage in Adults: Rule of Nines



Pearls

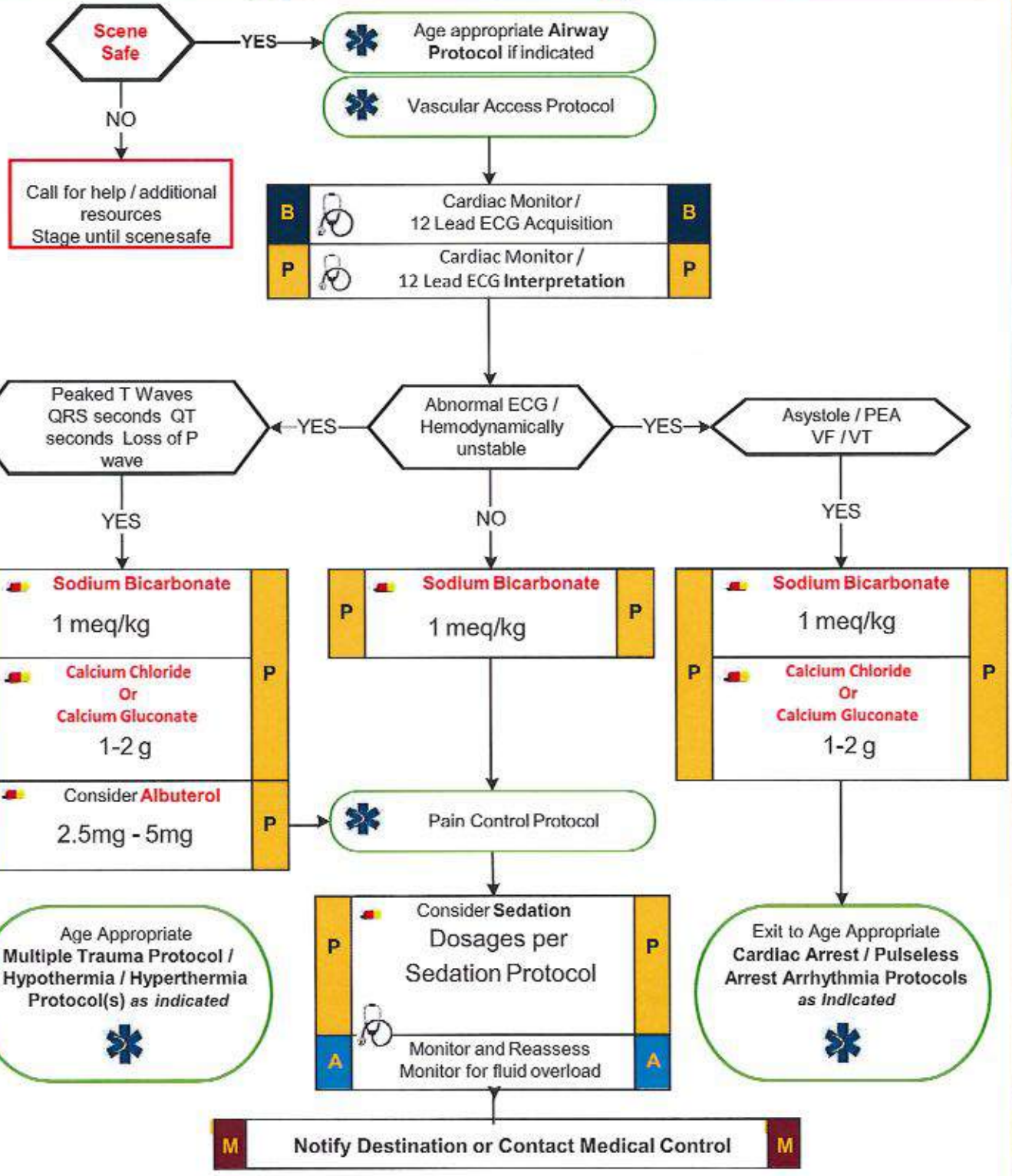
- Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro
- Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.
- Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source, does 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 u sing 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



Crush Syndrome Trauma

Pearls

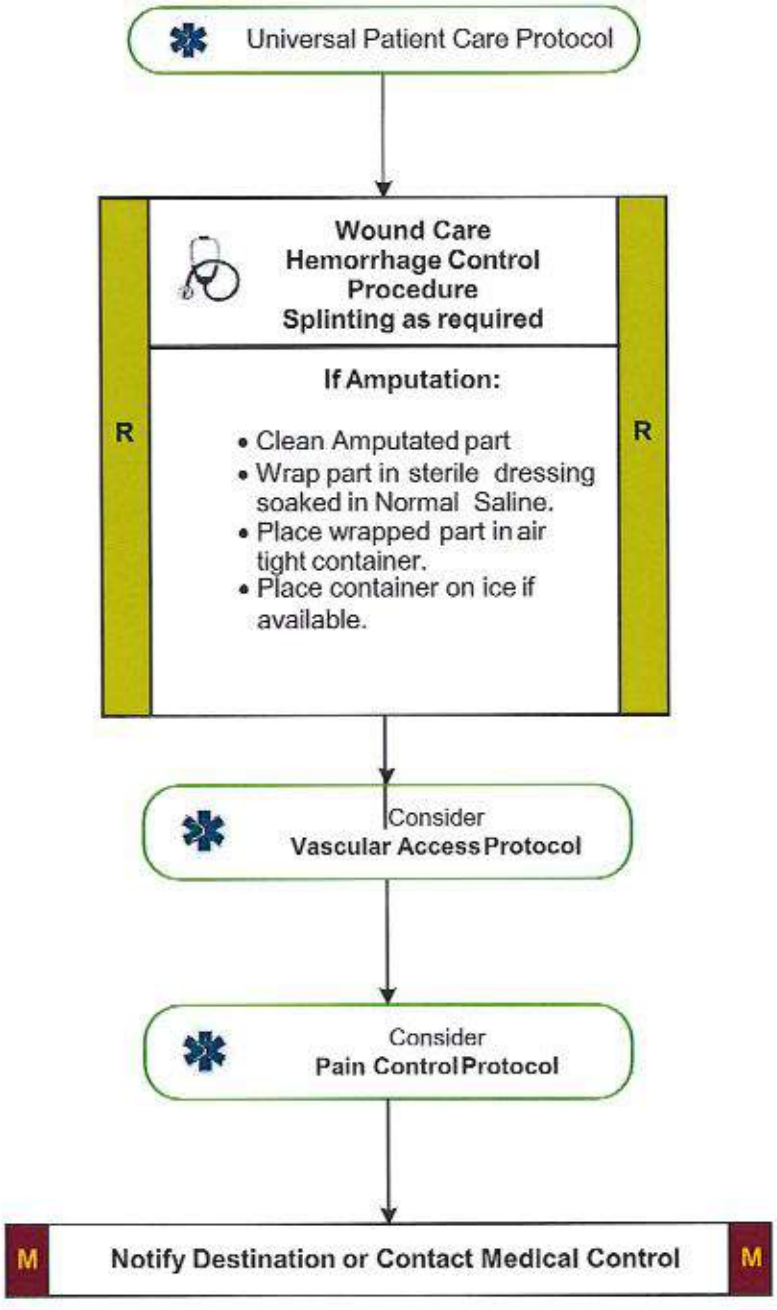
- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.**
- Avoid Ringers Lactate IV Solution due to potassium and potential worsening hyperkalemia
- Hyperkalemia from crush syndrome 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 Ventricular Tachycardia with a Pulse 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.
- If the Crush Injury is isolated to an extremity/extremities – application of a proximal tourniquet prior to release of the compression may be considered based upon Local Protocol

Extremity Trauma

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

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**



Extremity Trauma

Pearls

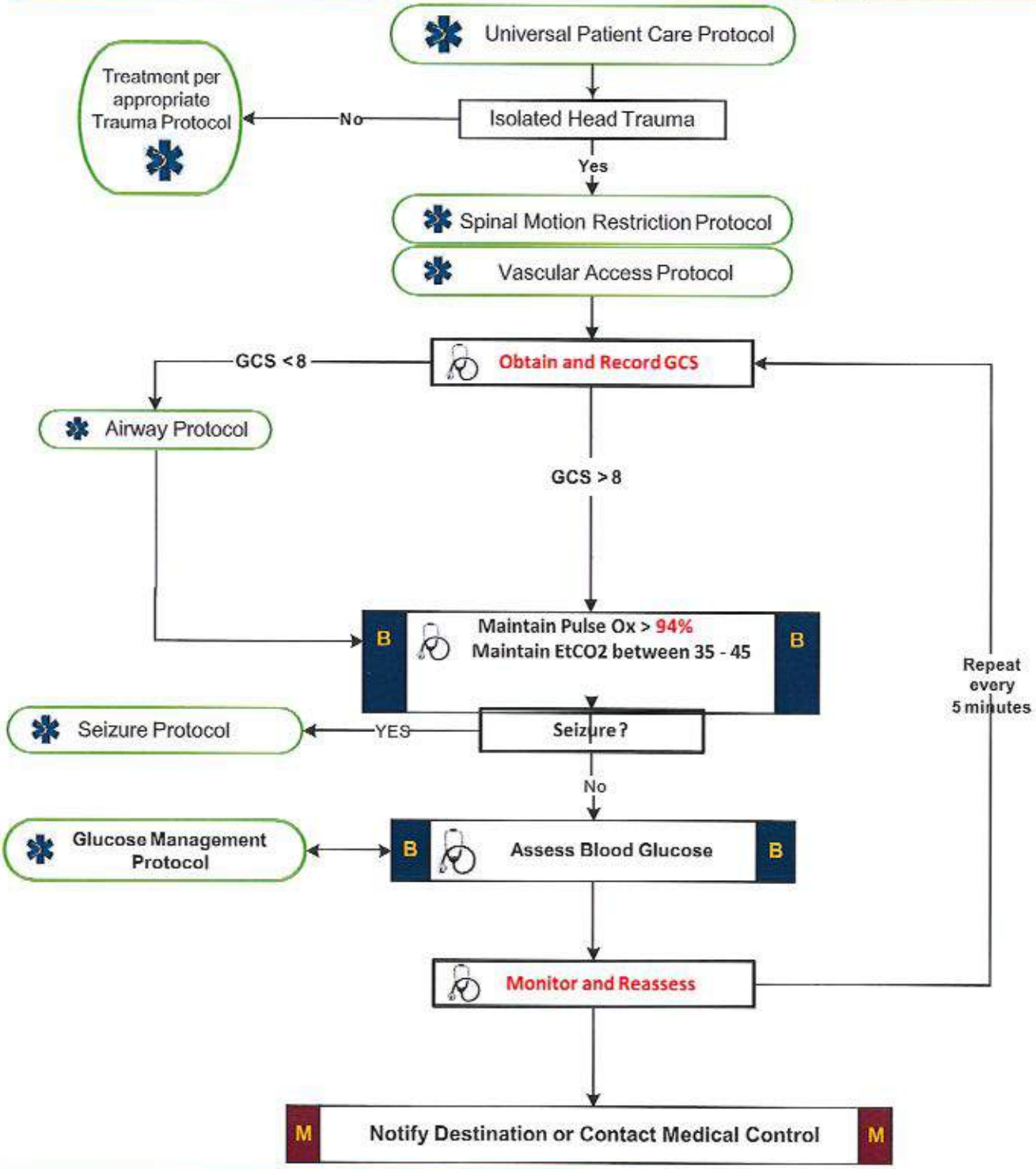
- **Recommended Exam: Mental Status, Extremity, Neuro**
- Peripheral neurovascular status is important.
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations 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.
- Hemostatic Device approved by Bureau of EMS.
- Multiple Casualty Incident: Tourniquet Procedure may be considered 1st instead of direct pressure.

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



Head Trauma

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- If GCS < 12 consider air / rapid transport
- In the absence of Capnography, hyperventilate the patient (adult: 20 breaths/min, child: 30, infant: 35) only if ongoing evidence of brain herniation (blown pupil, decorticate or decerebrate posturing, or bradycardia)
- 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.
- The most important item to monitor and document is a change in the level of consciousness.
- Consider Restraints/Sedation if necessary for patient s and/or personnel s protection per the Restraint Procedure.
- Limit IV fluids unless patient is hypotensive.
- Concussions are periods of confusion or LOC associated with trauma which may have resolved by the time EMS arrives. 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.
- 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 greater than 90% with supplemental oxygen.

Multiple Trauma

Hlstor
- y 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

Universal Patient Care Protocol

Spinal Motion Restriction Protocol

Assessment of Serious Signs / Symptoms
ABC and LOC

Airway Protocol
If indicated

Vascular Access Protocol

R — **VS / Perfusion / GCS** — R

ABNORMAL

Rapid Transport to appropriate destination using EMS System Trauma Plan
Limit Scene Time to 10 minutes
Provide Early Notification

B — Cardiac Monitor / 12 Lead EKG **Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

Hypotension Protocol

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

P — Consider **Chest Decompression**
Needle Procedure if indicated — P

Head Injury Protocol if indicated

R — **Monitor and Reassess** — R

NORMAL

Repeat Assessment

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

Transport to appropriate destination using **EMS System Trauma Plan**

R — **Monitor and Reassess** — R

Pain Protocol

M — **Notify Destination or Contact Medical Control** — M

Multiple Trauma

Pearls

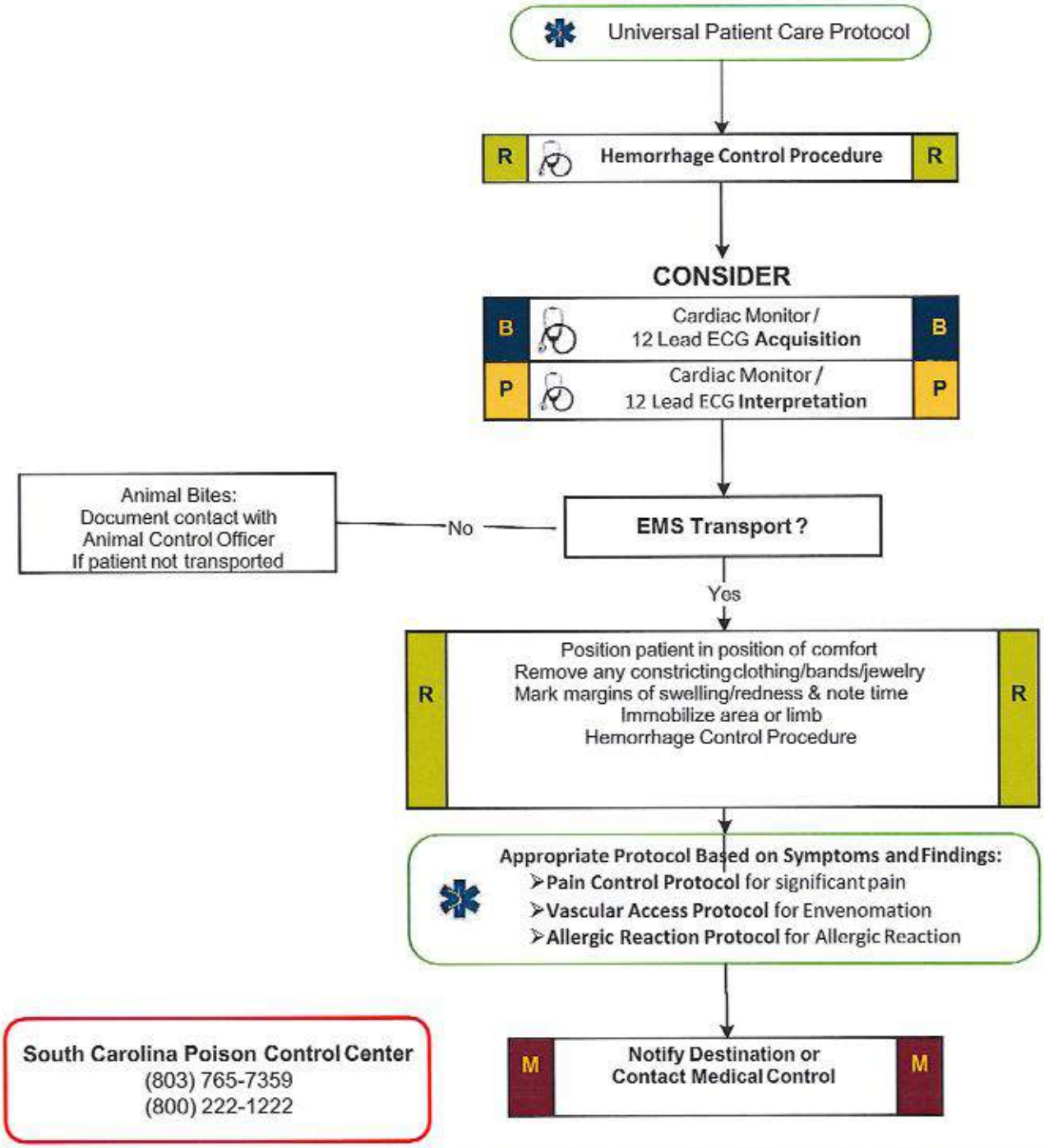
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- 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.
- Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient is the goal.
- Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained above 90%

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

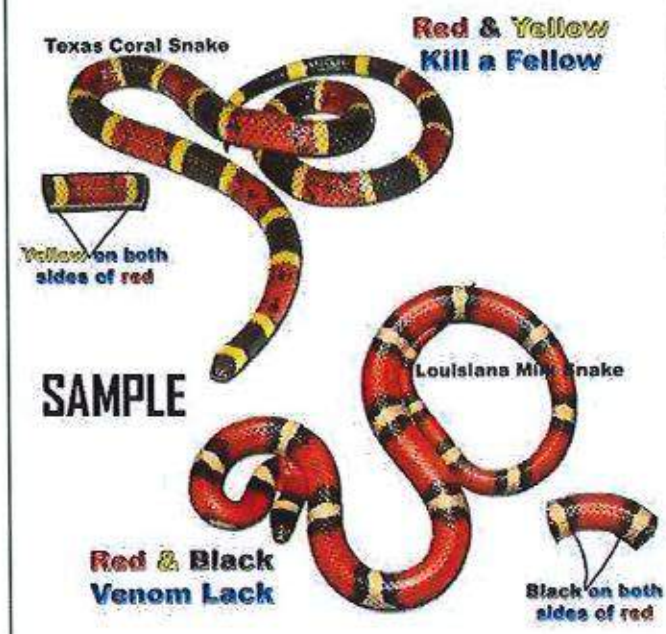
Signs and Symptoms
- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

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



South Carolina Poison Control Center
(803) 765-7359
(800) 222-1222

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 multicoda).
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake, copperhead, and water moccasin.
  - 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 (except for Coral snakes).
- 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 South Carolina Poison Control Center for guidance (1-800-222-1222).
- Do NOT apply Tourniquet for envenomations

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

Immediately Remove from Exposure

Universal Patient Care Protocol

R — High Flow Oxygen — R

B — Blood Glucose Analysis — B ↔ Glucose Management Protocol

Age appropriate **Multiple Trauma Protocol** if indicated ↔ **Spinal Motion Restriction Protocol** If indicated

B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

B — EtCO2 Monitoring Consider **CO Monitoring** — B

Adequate Oxygenation Ventilation

YES → **Monitor & Reassess** — Continue High Flow Oxygen

NO

Age appropriate **Airway Protocol** if indicated

Suspicion of Cyanide ?

YES

NO

SBP <90
Age Specific VS
SBP < 70 + 2 x Age
Poor Perfusion / Shock

YES → **Use as Indicated Hypotension / Shock Protocols**

NO

Monitor & Reassess

R — Continue High Flow Oxygen — R

M — Notify Destination or Contact Medical Control — M

Carbon Monoxide / Cyanide

CONSIDER CYANIDE POISONING FOR:

- Patients on **NITROPRUSSIDE** infusions
- Smoke Exposure: Burning wools, silk, plastics, furniture
- Industrial / Laboratory Settings.
- Metal Processing, Jewelry Manufacturing, Photographic Processing, Dyeing, Plastics Manufacturing
- Agriculture / Mining

Know the Symptoms of CO Poisoning...

Physical symptoms of CO poisoning vary, depending on the amount of CO in the bloodstream. The higher the concentration the greater the danger.

Mild Exposure
- Slight headache
- Nausea
- Vomiting
- Fatigue
- Flu-like symptoms

Medium Exposure
- Severe headache
- Drowsiness
- Confusion
- Rapid heartrate

Severe Exposure
- Unconsciousness
- Convulsions
- Cardiac/respiratory failure
- Death

Carbon Monoxide Poisoning

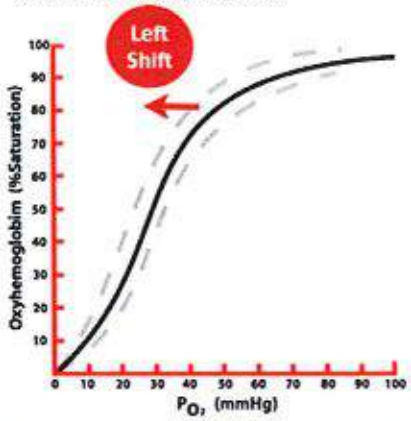
Incomplete combustion

$Fire + O_2 \longrightarrow CO_2 + water\ vapor + CO$

- Propane-powered vehicles (Zamboni, power mower, tractor)
- Home heating, natural gas stoves. kerosene heaters
- Indoor hibachi, clothes dryer, hot water heater

Risk Factors for Poor Outcomes

Carbon monoxide
(Decreased O_2 delivery to tissues)



Clinical
- Headache
- Nausea/vomiting
- Loss of consciousness
- Hypoxia, chest pain

Management
- Secure airway as needed
- Apply high-flow oxygen
- Hyperbaric oxygen
  - CO level > 25% (15% if pregnant)
  - Loss of consciousness
  - Severe metabolic acidosis (pH < 7.1)
  - Concern for end-organ ischemia

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.
- Pulse Oximetry Readings may read **FALSELY HIGH** with Carbon Monoxide Poisoning

Category A Isolation Protocol

History
- Positive 911 EMD / PSAP Screening
- **Travel history to – or residence in – a region with prevalent Category A disease within 21 days in conjunction with signs and symptoms listed within this protocol**

Signs and Symptoms
One of these
- Fever of > 100.4° F
- Severe headache
- Muscle pain
- Weakness
- Diarrhea
- Vomiting
- Abdominal Pain
- Unexplained hemorrhage

Differential
- Cold / Influenza
- Electrolyte imbalance
- Hyperglycemia
- Other Viral / Bacterial Infections

If you respond to an incident where an Emerging Disease (Category A) risk may be present, as determined by prescreening, **IMMEDIATELY** contact your DHEC Regional Public Health Epidemiology (EPI) as listed below. EPI will conduct a further risk assessment to determine what, if any, actions are necessary for disease containment or monitoring and assist in determining resources needed.

UPSTATE:
Abbeville, Anderson, Cherokee, Greenville, Greenwood, Laurens, McCormick, Oconee, Pickens, Spartanburg, Union
866.298.4442

MIDLANDS:
Aiken, Barnwell, Chester, Edgefield, Fairfield, Kershaw, Lancaster, Lexingtron, Newberry, Richland, Saluda, York
888.801.1046

PEE DEE:
Chesterfield, Clarendon, Darlington, Dillon, Florence, Georgetown, Horry, Lee, Marion, Marlboro, Sumter, Williamsburg
843.915.8845

LOWCOUNTRY:
Allendale, Bamberg, Beaufort, Berkeley, Calhoun, Charleston, Colleton, Dorchester, Hampton, Jasper, Orangeburg
843.441.1091

Appropriate **Personal Protective Equipment** in conjunction with current CDC recommendations **PRIOR** to entering scene

↓

Age Appropriate Airway Protocol *

↓

R **Vital Signs** **R**
□(Does not include auscultation of Breath Sounds)
□Recommend NIBP measurement and **Pulse Oximetry**

B Consider **Supplemental Oxygen** by NRB if SpO2 <94%, respiratory distress, altered LOC, or> 20 weeks pregnant **B**

Consider **Cardiac Monitor** **ONLY** if patient is symptomatic for cardiac related complaint

R Provide Supportive Care Continue to calm and reassure the patient(s) **R**

↓

Is the Patient Stable?

YES → **Provide for Transport to Appropriate Facility following orders from Incident Commander**

NO → Exit to appropriate treatment protocol. Transport Immediately

If your agency is providing transport, alert the Receiving Medical Facility:
- v As soon as feasible, confidentially notify the Receiving Facility that you are transporting a potential Ebola paitent.
- v **DO NOT TAKE THE PATIENT INTO THE MEDICAL FACILITY UNTIL YOU ARE INSTRUCTED TO DO SO.**
- v **MEDICAL FACILITY PERSONNEL WILL DIRECT YOU TO THE PROPER ROOM THROUGH A SAFE ENTRANCE.**

Category A Isolation Protocol

* No routine aerosol generating procedures unless absolutely medically necessary. This includes CPAP / BiPAP. Advanced airway procedures should be performed under controlled conditions while not in motion.

** No routine IV lines unless absolutely medically necessary and then only under controlled conditions while not in motion.

Pearls:

- **Incubation period 2 – 21 days.**
- A patient is only infectious when symptomatic.
- Once ill, a person can spread virus to others through direct contact with body fluids: blood, urine, sweat, semen, feces, and tears.
- **ONLY Personnel who have been well trained in use of PPE and know how to put it on and take it off safely and properly should enter contaminated zone.**
- There should be **NO** exposed skin once full PPE has been put on prior to entry.
- Per CDC Guidelines, withhold invasive procedures unless, absolutely necessary:
  - Limit the use of needles and other sharps as much as possible. All needles and sharps should be handled with extreme care and disposed of in puncture-proof, sealed containers. Safety devices must be employed immediately after use.
  - Do not attempt any invasive procedures while in motion to minimize exposure risk(s).
- Always have a monitor for the doffing procedure to insure there is no provider contamination during doffing.
- There should be a standardized procedure for donning and doffing that is monitored by a Safety Officerr.
- Remain cognizant that potential patients may experience heightened anxiety due to situation and EMS Responder in PPE.

Drowning

History
- Submersion in water regardless of depth
- Possible trauma to C-spine
- Possible history of trauma ie: diving board
- Duration of immersion
- Temperature of water or
- possibility of hypothermia

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing
- Apnea
- Stridor / Wheezing / Rales

Differential
- Trauma
- Pre-existing medical problem (hypoglycemia, cardiac dysrhythmia)
- Pressure injury (diving)
- Barotrauma
- Decompression sickness
- Post-immersion syndrome
- Hypothermia

Universal Patient Care Protocol

Awake and Alert

R — **Supplemental Oxygen As Tolerated** — R

Spinal Motion Restriction Protocol (as indicated)

Remove wet clothing
Dry / Warm Patient

Monitor & Reassess

Encourage transport and evaluation even if asymptomatic or with minimal symptoms
Asymptomatic drowning patients (refusing transport) should be instructed to seek medical care/call 911 if they develop any symptoms within 6 hours

Vascular Access Protocol (as indicated)

B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B
P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Awake but with AMS

R — **5 Breaths via BVM / Mouth-to-Mask As Tolerated** — R
R — **Supplemental Oxygen As Tolerated** — R

Age Appropriate Airway Protocol *(as indicated)*

Spinal Motion Restriction Protocol *(as indicated)*

Age Appropriate Altered Mental Status Protocol *(as indicated)*

Remove wet clothing
Dry / Warm Patient

B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B
P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Vascular Access Protocol

Age Appropriate Respiratory Distress Protocol *(as indicated)*

Unresponsive

Does patient have pulse?

YES → R — **5 Breaths via BVM / Mouth-to-Mask As Tolerated** — R; R — **Supplemental Oxygen As Tolerated** — R

NO

M — **Notify Destination or Contact Medical Control** — M

Exit to Age Appropriate:
Airway Protocol / Cardiac Arrest / Arrhythmia Protocol(s) / Respiratory Distress Protocol / Altered Mental Status and/or **Spinal Motion Restriction Protocol** as indicated

Drowning

Types of drowning

- 1. Wet drowning= primary drowning
- 2. Dry drowning= 10-15%, laryngospasm, thick mucous→ foam plug, panoramic views of past life, pleasant dreams without distress.
- 3. Secondary drowning= post immersion syndrome= near drowning; Secondary drowning is death due to chemical or biological changes in the lungs after a near drowning incident ; resuscitated and survives for 24 hours, +/- conscious, hypoxemia→ brain damage, electrolyte disturbances, pulmonary edema, hemoglobinuria, chemical pneumonitis
- 4. Immersion syndrome= hydrocution= submersion inhibition; cold water→ n. endings +/ strike epigastrium +/ entering ear drums, nasal passages.
  - Horizontal entry (dive)→ pressure on abdomen
  - All these → Vagal inhibition→ Cardiac arrest→ death

Pearls

- **Recommended Exam: Respiratory, Mental status, Trauma Survey, Skin, Neuro**
- **Cold water drowning is should be considered when the ambient water temperature is less than 70 degrees Fahrenheit.**
- **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 less than 25 minutes.**
- **Regardless of water temperature – If submersion time great than 1 hour consider moving to recovery phase instead of rescue.**
- **Foam is usually present in airway and may be coplous, DO NOT waste time attempting to suction. Ventilate with BVM through foa m (suctlon 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 worsen ing 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
- Exposure to increased temperatures and / or humidity
- Past medical history / medications
- Extreme exertion
- Time and length of exposure
- Poor PO intake
- Fatigue and / or muscle cramping
- EtOH / Illicit Drug Use

Signs and Symptoms
- Altered mental status or unconsciousness
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

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

Universal Patient Care Protocol

Signs/Symptoms of Hyperthermia

B — Temperature Measurement Procedure if available — B

B — Remove from heat source to cool environment — B
B — Passive cooling measures — B
B — Remove tight clothing — B
B — Blood Glucose Analysis — B

Seizure Protocol If indicated

If Indicated Glucose Management Protocol

Assess Symptom Severity

HEAT CRAMPS
Normal to elevated body temperature Warm, moist skin
Weakness, Muscle cramping

HEAT EXHAUSTION
Elevated body temperature
Cool, moist skin
Weakness, Anxious, Tachypnea

HEAT STROKE
High body temperature, usually > 104 F Hot, dry skin
Hypotension, AMS / Coma

PO Fluids as tolerated

Monitor and Reassess

R — Active Cooling Measures — R
B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B
P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Airway Protocol (as indicated)

Vascular Access Protocol (as indicated)

Altered Mental Status Protocol (as indicated)

Hypotension / Poor Perfusion?

Yes

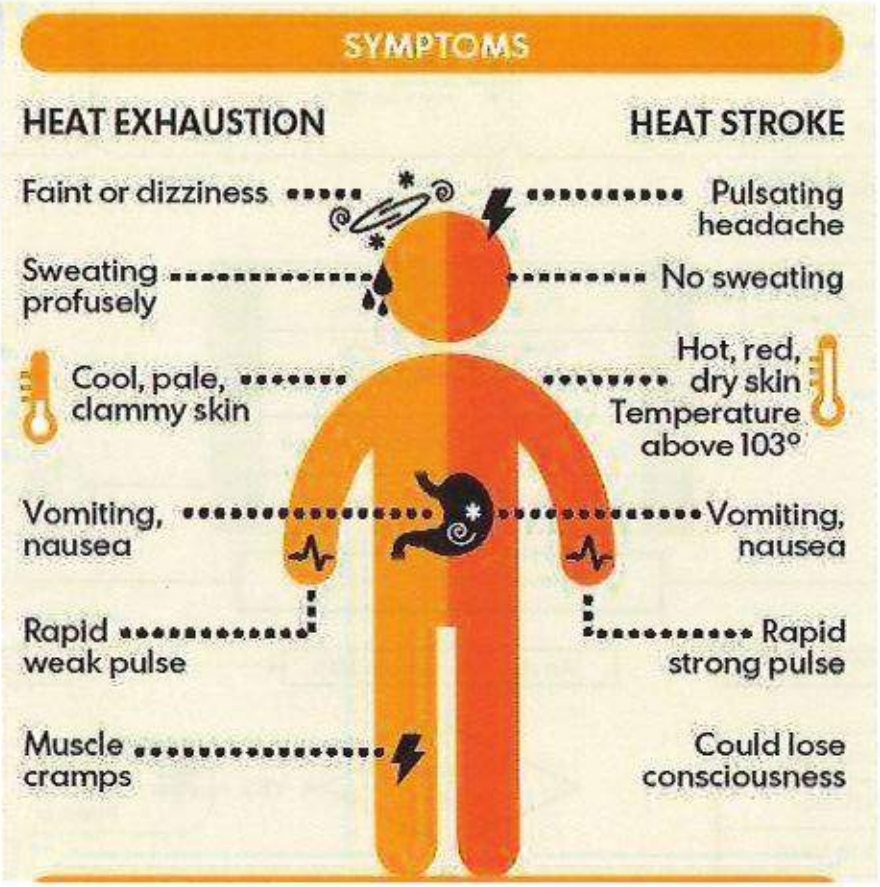
No

Hypotension Protocol (as indicated)

Monitor and Reassess

M — **Notify Destination or Contact Medical Control** — M

Hyperthermia



Pearls

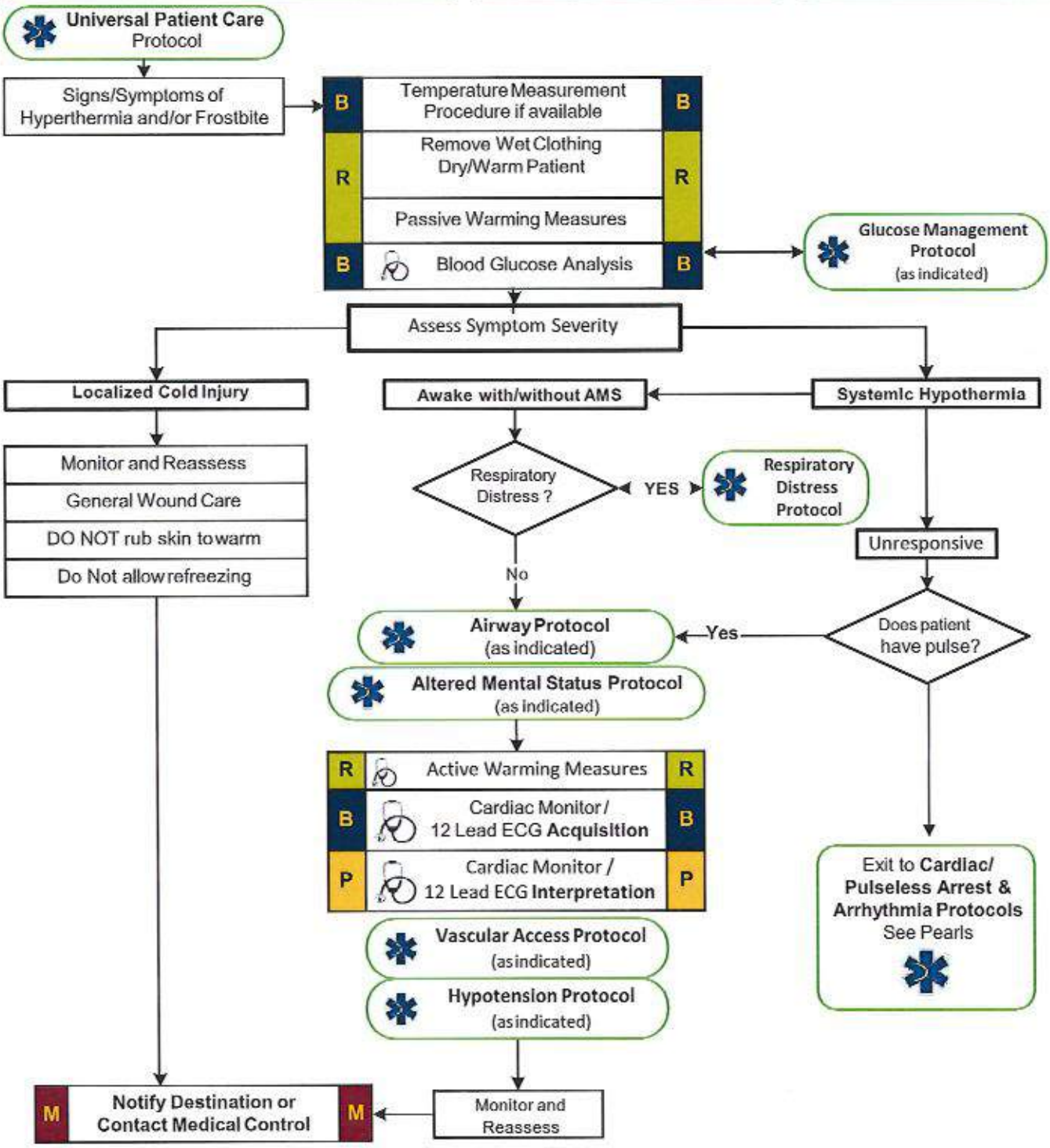
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, antipsychotics, synthetic cannabinoids, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperaturos.
- 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.
- **Rapid cooling takes precedence over transport as early cooling decreased morbidity and mortality. Goal temperature is about 102.5 degrees F.**
- **ACTIVE Cooling includes EVAPORATIVE Cooling as well as placement of Ice Packs in the groin, axillae, and on the head.**

Hypothermia

History
- Past medical history / medications
- Exposure to environment even in normal temperatures
- Exposure to extreme cold
- Extremes of age, very young & old
- Drug use: alcohol, barbituates
- Infections / Sepsis
- Length of exposure / wetness / wind chill

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

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



Hypothermia

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature >93.2 F, 32 degrees C.)**
- **Hypothermia categories:**
  Mild 90 – degrees F (32 – degrees C) Moderate
  82 – degrees F (28 – 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.
- ACTIVE WARMING Includes: Hot packs can be activated and placed in the axillae and groin area if available.
  - Care should be taken not to place the packs directly against the patient s skin
- **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 withheld due to this concern. Intubation can cause ventricular fibrillation so it should be done gently by most experienced person

➢Below 86 ^{O}F (30 ^{O}C) antiarrhythmics may not work and if given should be given at increased intervals. Contac Medical Control for direction. Epinephrine / Vasopressin can be administered. Below 86 ^{O}F (30 ^{O}C) 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 ^{O}F (30 ^{O}C) then defibrillate 1 time If defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact Medical Control for direction.

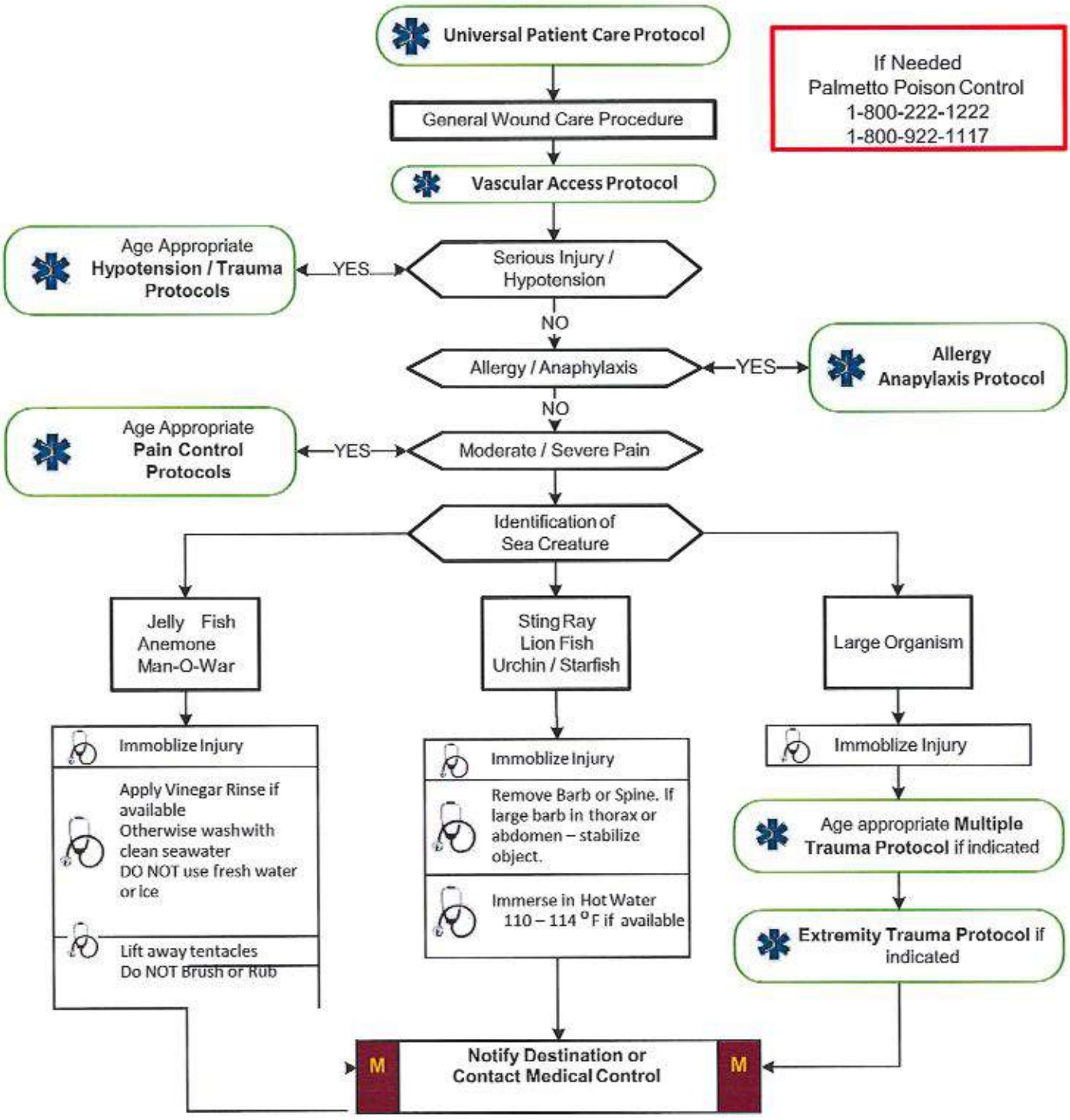
➢Hypothermia may produce severe bradycardia so take at least 45 seconds to palpate a pulse.

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



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.
- Arrest the envenomation by inactivation of the venom as appropriate.
- Ensure good wound care, immobilization and pain control.

Nerve Agent Protocol (Organophosphate)

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

Signs and Symptoms
- Salivation
- Lacrimation
- Urination; increased, loss of control
- Defecation / Diarrhea
- GI Upset/abdominal pain/cramping
- Emesis
- Muscle 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.)

Scene Safe. Appropriate PPE

NO → Call for help / additional resources; stage until scene safe

Yes

Universal Patient Care Protocol

Seizure Protocol (if indicated)

Obtain history of exposure; observe for specific toxidromes; initiate triage and/or decontamination as indicted

Symptom Severity

Major Symptoms: Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest

Minor Symptoms: Respiratory Distress + SLUDGEM

Asymptomatic

Vascular Access Protocol

R	**Nerve Agent Kit IM** **Up to 3 Doses Rapidly** As based on symptom Severity - If available	R
P	**Atropine IM/IO/IV** 1-3mg as needed	P

Monitor and Reassess every 15 minutes for symptoms; initiate treatment per appropriate arm

M **Notify Destination or Contact Medical Control** M

Nerve Agent Protocol (Organophosphate)

Organophosphate Poisoning

Potent cholinesterase inhibitors
- Organophosphates
- Carbamates

Cholinergic toxicity

↓Cholinesterase = ↑Acetylcholine

Muscarinic signs

Organophosphates
Parathion
Fenthion
Malathion
Diazinon
Carbamates
Methomyl
Aldicarb
Nerve agents
Sarin
Tabun
Soman

SLUDGE
- **S**alivation
- **L**acrimation
- **U**rination
- **D**iarrhea
- **G**I cramps
- **E**mesis

DUMBBELLS
- **D**iarrhea
- **U**rination
- **M**iosis
- **B**radycardia
- **B**ronchospasm
- **E**mesis
- **L**acrimation
- **L**ethargy
- **S**alivation
- **S**eizures

Nicotinic Effects
(similar to succinylcholine)
- Fasciculations
- Muscle weakness
- Paralysis

Treatment
- Atropine (anticholinergic...does not bind nicotinic receptors)
- Pralidoxime (2-PAM) - Regeneration of cholinesterase

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 f rom 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.

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

Universal Patient Care Protocol

Radiation Burn / Exposure

Assess Burn / Concomitant Injury Severity

R **Consider Decontamination of External Radiation Source if Patient is Stable** R

B **Cardiac Monitor 12 Lead ECG Acquisition** B

P Cardiac Monitor / EKG **Interpretation** P

→ Exit to Age Appropriate **Cardiac/ Pulseless Arrest & Arrhythmia Protocols** (as indicated)

R Irrigate any contaminated area copiously for **AT LEAST** 15 minutes R

Go To Age Appropriate **Thermal Burn Protocol**

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.*

Radiation Incident

Critical (Red)

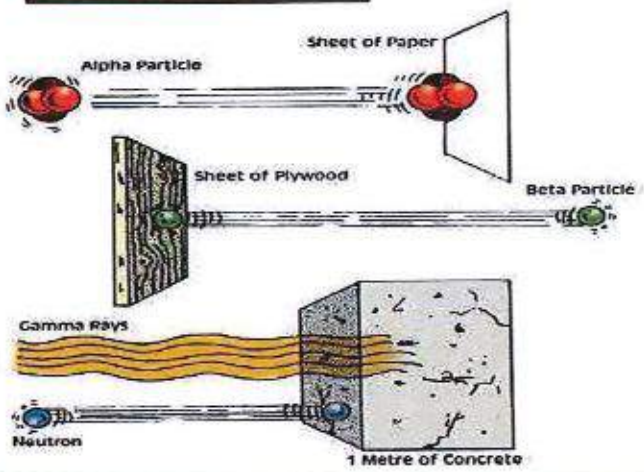
>15% TBSA 2nd/3rd Degree Burn Burns with Multiple Trauma Burns with definite airway compromise (When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Serious (Yellow)

5-15% TBSA 2nd/3rd Degree Burn Suspected Inhalation injury or requiring intubation for airway stabilization Hypotension or GCS < 14 (When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Minor (Green)

< 5% TBSA 2nd/3rd Degree Burn No Inhalation Injury, Not Intubated, Normotensive GCS>14 (Transport to the Local Hospital)



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 ch emical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been expos ed 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 unli kely 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 - Shielding from the source
- Dirty bombs ingredients generally include previously used radioactive material and combined with a conventional explosive dev ice 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: Nau sea/ Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.
- This event may require an activation of the National Radiation Injury Treatment Network.

Table of Contents

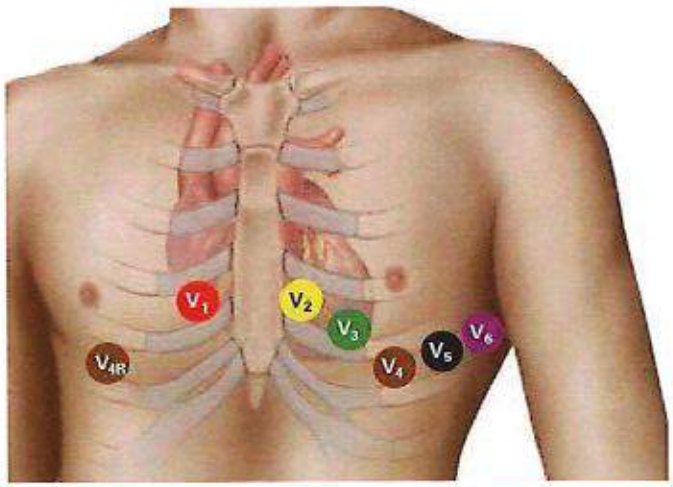
Procedure

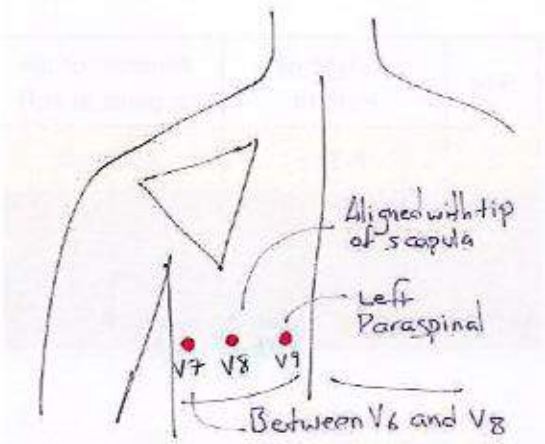
Standards Procedure (Skill)
12 Lead ECG

Clinical Indications:

Procedure:

- Assess patient and monitor cardiac status.
- Administer oxygen as patient condition warrants.
- If patient is unstable, definitive treatment is the priority. If patient is stable or
- stabilized after treatment, perform a 12 Lead ECG.
- Prepare ECG monitor and connect patient cable with electrodes.
- Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
- Expose chest and prep as necessary. Modesty of the patient should be respected.
- 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
  - **V4R** right side of the chest 5th intercostal space mid-clavicular line (For right-sided 12 lead ECG)
- Instruct patient to remain still. If patient will tolerate place in supine position.
- Press the appropriate button to acquire the 12 Lead ECG.
- 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.
- Once acquired, transmit the ECG data to the appropriate hospital.
- Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
- Monitor the patient while continuing with the treatment protocol.
- Download data as per guidelines and attach a copy of the 12 lead to the PCR.
- Document the procedure, time, and results on/with the patient care report (PCR)





Airway: BIAD King LT

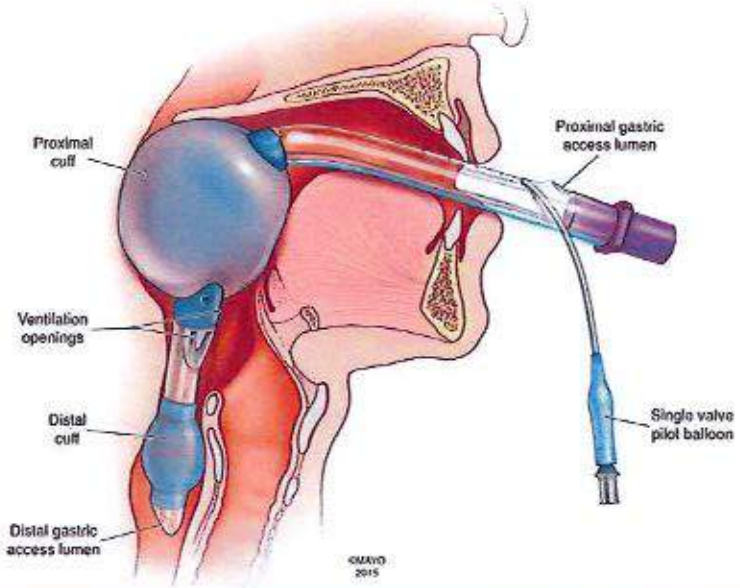
Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Tracheal 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.

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.
6. Once the tip is at the base of the tongue, rotate the tube back to midline without excessive force. Insert the airway until the base of the connector is in line with the teeth and gums.
7. Inflate the pilot balloon with appropriate amount (see chart below) of air depending on the size the device used.
8. **Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.**
9. Confirm tube placement by auscultation of breath sounds, epigastrium sounds and chest rise and fall. Monitor continuously through waveform capnography and pulse oximetry.
10. Secure with commercial tube holder device.
11. **Confirm tube placement and monitor continuously through waveform capnography and pulse oximetry.**
12. If the King LT is effective in ventilating and oxygenating the patient do not attempt to replace it with endotracheal tube.

Size	Height of Patient	Amount of air to place in cuff
3	4-5 ft	40-55ml
4	5-6 ft	50-70ml
5	Greater than 6Ft	60-80ml



Standards Procedure (Skill)

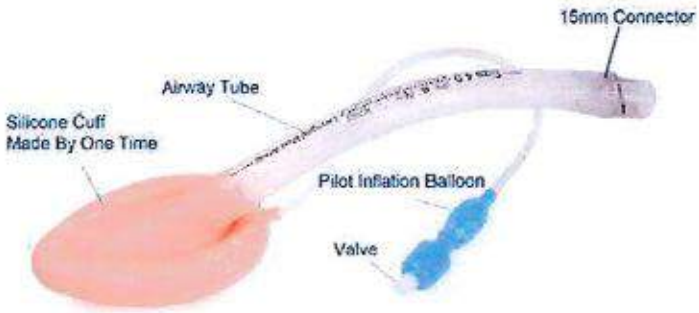
Airway: BIAD-Laryngeal Mask Airway (LMA)

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.
- 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:

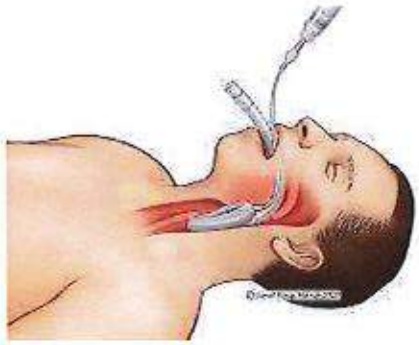
- Deforming Facial Trauma
- Pulmonary Fibrosis
- Morbid Obesity



Procedure:

- Check the tube for proper inflation and deflation.
- Lubricate with a water-soluble jelly.
- Pre-Oxygenate the patient with 100% Oxygen
- Insert the LMA into the hypopharynx until resistance is met.
- Inflate the cuff until a seal is obtained.
- Connect the LMA to an ambu bag and assess for breath sounds and air entry.
- **Confirm tube placement.**
- Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
- **It is required that the airway be monitored continuously through Capnography and Pulse Oximetry.**
- Re-verify LMA placement after every move and upon arrival in the ED
- Document the procedure, time, and result (success) on/with the patient care report (PCR)

Size	Weight of patient	Max amount of air into cuff
1	0-5kg	4ml
1.5	5-10kg	7ml
2	10-20kg	10ml
2.5	20-30kg	14ml



Airway: CPAP

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

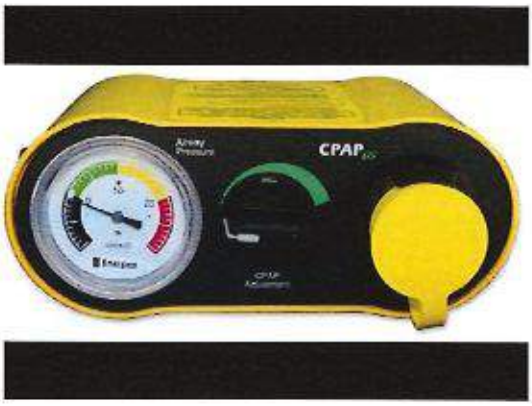
- CPAP is indicated in all patients whom inadequate ventilation is suspected that is not associated with Asthma. This could be as a result of pulmonary edema, pneumonia, COPD, etc.

Procedure:

- Explain the procedure to the patient.
- Consider placement of a nasopharyngeal airway.
- Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
- Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
- 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 – 15 cmH20 for Pulmonary Edema, Near Drowning, possible aspiration or pneumonia
- 3 – 5 cm H20 for COPD
- Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
- Titrate oxygen levels to the patient's response. Many patients respond to lower FIO2 (30- 50%).
- 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.
- Document time and response on patient care report (PCR)

Contraindications

- Patient less than 18 years of age
- Respiratory Arrest
- Altered Mentation
- Agonal Respirations
- Hypotensive
- Pneumothorax
- Penetrating Chest Trauma
- Persistent Vomiting
- Anything that prevents a proper mask seal



Standards Procedure (Skill)

Airway: Endotracheal Tube Introducer (Bougie)

Clinical Indications:

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

Contraindications:

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

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 reattempted 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 CO_2 monitor, and record and monitor readings to assure continued tracheal intubation.

Standards Procedure (Skill)

Airway: Foreign Body Obstruction

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:

1. 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 my clutch his/her neck in the universal choking sign.
2. **For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
4. **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
5. 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.
6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
7. 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.
8. Document the methods used and result of these procedures in the patient care report (PCR).

Standards Procedure (Skill)

Airway – Nebulizer Inhalation Therapy

Clinical Indications:

- Patients experiencing bronchospasm.

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.
- EMT-B and EMT-A may only assist patient in setup and administration.

Airway: Suctioning-Advanced

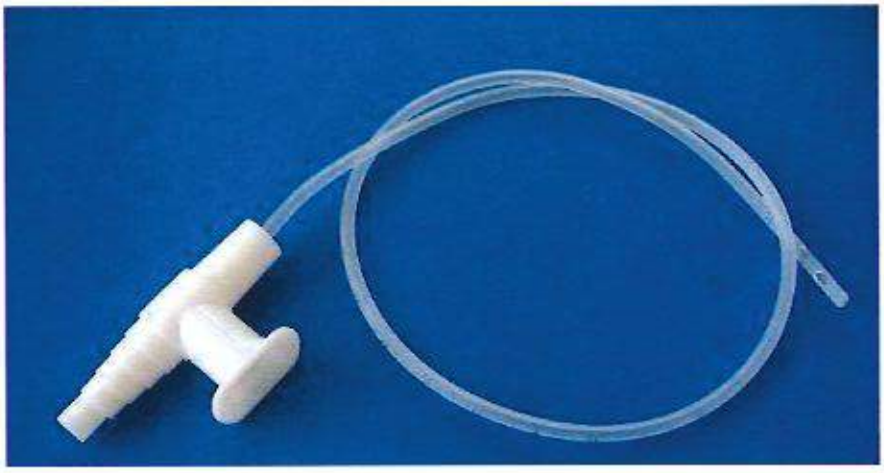
Clinical Indications:

- 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 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. Suctioning should be no longer then 10-15 seconds.
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).

*NOTE: Clean suction with sterile water in between suctioning.



Airway: Suctioning-Basic

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.(ie. dentures, partials, etc)
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device for no more than 10 seconds to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
9. Record the time and result of the suctioning in the patient care report (PCR).

Airway: Tracheostomy Tube Change

Clinical Indications:

- 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 Shiley, 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 difficultly 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 tracheotomy sites.**
11. Document procedure, confirmation, patient response, and any complications in the PCR

Airway: Ventilator Operation

Clinical Indications:

- Management of the ventilation of a patient during a prolonged or interfacility transportof 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.
9. **All patients who have an advanced airway in place must 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/alarms, remove the ventilator from the endotracheal tube and use a bag-valve mask with 100% O_2. Contact medical control immediately.

Standards Procedure (Skill)

Blood Glucose Analysis

Clinical Indications:

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

High reading is a BGL greater than 600

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick .
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 during unit check off, if any clinically suspicious readings are noted, and/or as recommended by the manufacturer and document in the log.

ERROR CODES

COD E	ERROR	SOLUTION
E-0	Software Error	Perform test again, if you get the same code again contact supervisor.
E-1	System Hardware Error	Perform test again, if you get the same code again contact supervisor.
E-2	Operating Temperature Error	Move meter to an area where the temperature is acceptable (59° to 104°F) Allow meter to adjust and repeat test.
E-3	User Strip Error	The test strip is defective or previously used. Repeat the test with a new strip.
E-4	Short Sample Error	An Insufficient sample (control or blood) placed into test strip. Repeat test with new strip.
E-5	Strip Not Recognized Error	Perform test again, if you get the same code again contact supervisor.
E-8	Bad Strip Error	The test strip is defective or bad. Repeat the test with a new strip.
E-9	Bad Sample Error	A problem was detected with the sample. Repeat the test with a new strip.

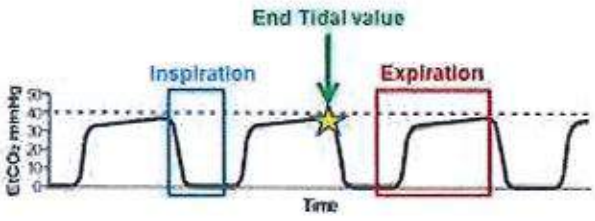
Capnography

Clinical Indications:

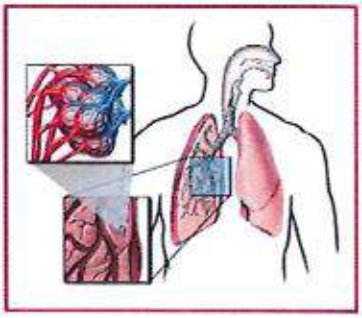
- Capnography shall be used when available with the use of all invasive airway procedures including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography should also be used when possible with CPAP.

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO_2 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 CO_2 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.

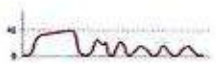


- During cellular respiration, small amounts of CO2 produced, is excreted via exhalation
- When no cellular respiration is occurring, even if ventilation is, there will be no CO2 exhaled
  - In poor perfusion states (cardiac arrest) no CO2 is transported to the lungs to be exhaled, so a low reading will occur
  - In poor ventilation states (hypoventilation) CO2 is retained, so a high reading will occur



Sudden loss of waveform
- ET tube disconnected, dislodged, kinked or obstructed
- Loss of circulatory function

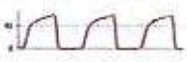
Decreasing $EtCO_2$
- ET tube cuff leak
- ET tube in hypopharynx
- Partial obstruction



CPR Assessment
- Attempt to maintain minimum of 10mmHg

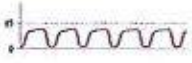
Sudden increase in $EtCO_2$
- Return of spontaneous circulation (ROSC)

Bronchospasm ("Shark-fin" appearance)
- Asthma
- COPD



Hypoventilation

Hyperventilation



Decreased $EtCO_2$
- Apnea
- Sedation

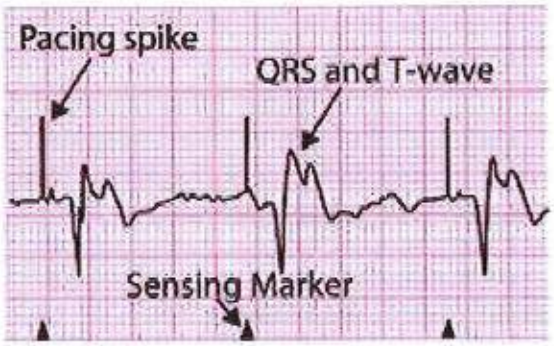
Cardiac: External Pacing

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.

Procedure:

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads as directed by packaging instructions.
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 femoral or carotid 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.



The pacing spike is produced when the pacemaker has delivered output (energy) to the myocardium. This is also known as the 'pacing artefact'. Electrical capture is indicated when a wide QRS complex follows the pacing spike, as demonstrated.

Standards Procedure (Skill)

Chest Decompression

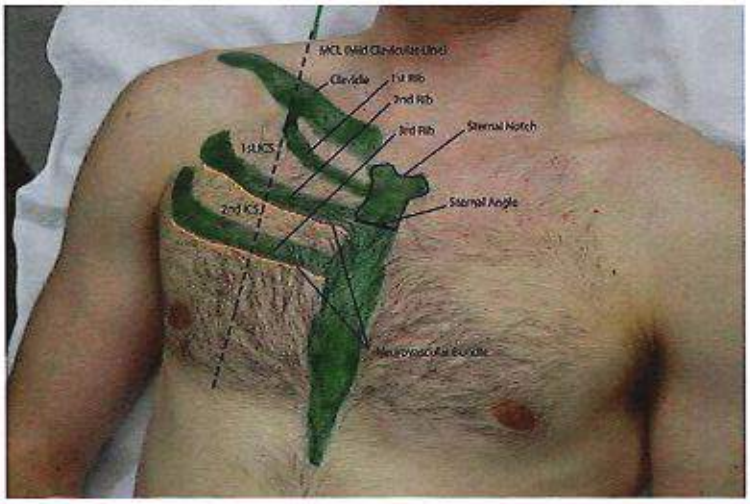
Clinical Indications:

- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
  - Jugular vein distention.
  - Tracheal deviation away from the side of the injury (often a late sign).
  - Absent or decreased breath sounds on the affected side.
  - Hyper-resonance to percussion on the affected side.
  - Increased resistance when ventilating a patient.

- 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.
   - 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. Assess and lung sounds and monitor pulse oximetry.
9. 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.)



Childbirth

Clinical Indications:

- Imminent delivery with crowning

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 for 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. **(Mouth first then Nose)**
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 transport to the hospital after delivery.**

Complications:

Prolapsed Cord

- Don't reinsert cord
- With 2 gloved fingers lift the baby off of the cord if circulation is comprised.
- If able have mother in the knee to chest position.
- Saline soaked dressings applied to the cord for extended delivery time

Breech Presentation

- Do not pull. If the head doesn't deliver make a V with your gloved fingers to provide an airway for the infant. **(Rapid Transport)**

Shoulder Dystonia

- Do Not force delivery
- Have mother flex thighs up to relieve pressure
- **(Rapid Transport)**

Standard Procedure

Criteria for Death/Withholding Resuscitation

Purpose:

- To honor those who have obviously expired prior to EMS arrival.

Assessment:

- 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.
  - Traumatic arrest in asystole.
  - 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 or un-witnessed arrest with asystole on the EKG in two leads.

Procedure:

1. 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.
2. 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 Resuscitative Efforts. Policy**
   b) Patient care responsibilities are transferred to the destination hospital staff.
   c) Orders to terminate resuscitation are received by Medical Control.

Standard Procedure

Discontinuation of Prehospital Resuscitative Efforts

Purpose:

- To allow for the discontinuation of pre-hospital resuscitation after the delivery of ALS resuscitative efforts.

Procedure:

- Discontinuation of CPRA and ALS intervention for a medical cardiac arrest patient may be implemented prior to contact with Medical Control if **ALL** of the follow criteria have been satisfied.
    1. Patient is 18 years of age or older.
    2. High quality CPR has been administered.
    3. Airway has been successful managed with verification of bilateral lung sounds, absent epigastric sounds, and capnography. Acceptable management techniques include oral tracheal intubation or blind insertion airway device such as the KING LT.
    4. IV or IO access has been achieved.
    5. Rhythm appropriate medications and defibrillation have been administered according to protocol.
    6. Persistent asystole (6 seconds in two leads) is present and no reversible causes are identified after a minimum of 25 minutes of resuscitation or PEA with EtCO2 less than or equal to 10 after 25 minutes of resuscitation.
    7. Failure to established sustained palpable pulses.
    8. Non reactive pupils
    9. No evidence of hypothermia
    10. **ALL** EMS personal involved in the patients care agree that discontinuation of the resuscitation is appropriate.
    11. The patient is in a residence (non- public place) and the scene is safe to do so.
    12. If **ALL** of the above criteria are not met and discontinuation of prehospital resuscitation is deemed appropriate , contact Medical Control.
    13. If the patient is in a public place or the scene is deemed unsafe to terminate resuscitation; work the arrest until the patient can be transferred to the ambulance. Continue resuscitation efforts, transport to the closest appropriate emergency room, and contact Medical Control for possible termination orders.
    14. Traumatic arrest can be terminated on scene with out contacting Medical Control if at any point the patient presents with asystole.
    15. Document all patient care and interactions with the patients family, personal physician, Medical Control, Coroner, and law enforcement in the patient care report (PCR).
    16. Involve the family early in the resuscitation process;
        a. Provide reassurance that everything possible is being done
        b. Ease the family into the decision to terminate resuscitation
        c. Provide emotional support
    17. Contact the coroner's office on all deaths
    18. If a possible coroner case, involve family in discontinuation, but do not allow them to disturb the patient or the surroundings.
    19. Make the patient presentable by removing airway devices from the body.

Standards Procedure (Skill)

Defibrillation

Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

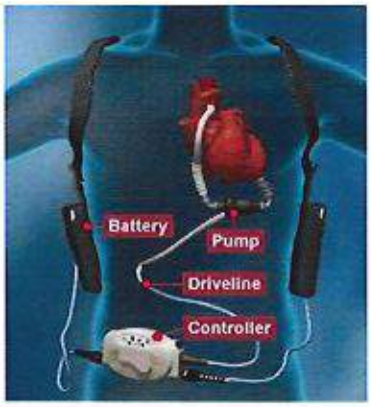
Procedure:

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 as directed by packaging instructions.
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.

Left Ventricular Assist Device (LVAD)

Left ventricular assist devices (LVAD) are used in patients with end stage heart failure. The device consists of a pump, and external control device, and a power supply. The pump is located inside the chest cavity that pumps blood from the left ventricle to the aorta providing a continuous flow of blood through the body.

- Focused history and physical exam
  - Patient with end-stage heart failure with surgically implanted pump.
  - Patients will often have a packet of information with specific treatment instructions.
  - Evaluate for Medical Alert Bracelet with instructions. Follow instructions as able.
  - Every patient should have a backup equipment bag for his or her LVAD.
  - Patients and families are usually well educated on the power supply of the LVAD. Follow their directions on scene utilizing their expertise.
- Treatment Plan
  1) Check to see if patient is responsive.
  2) Check for LVAD functionality.
     a. Patient will likely not have a pulse due to continuous flow of LVAD, and pulse oximetry readings may be inaccurate.
     b. May be unable to obtain cuff pressure due to continuous flow.
     c. Check for adequate perfusion using skin signs. (skin color, temperature, and condition)
  3) Check the patient's cardiac rhythm.
     a. If patient has abnormal cardiac rhythm, ACLS protocol can be followed including all medications and defibrillation.
     b. **The pump does not affect EKGs.**
  4) Check for alarm lights or sounds on the control device. A continuous tone is **URGENT**.
  5) If the pump has stopped
     a. Check cable connections: fix loose connections.
     b. Check power supply and/or replace batteries.
     c. Change controller if pump still does not start.
  6) **Chest compressions should be a last resort as this may dislodge the pump causing the patient to bleed to death.**
     a. If you are unable to restart the pump after troubleshooting, begin chest compressions.
- Key Considerations
  - ALWAYS talk to family/caregivers as they have specific knowledge and skills. Call the LVAD coordinator; they are available 24/7.
  - Common complications in LVAD patients include stroke and TIA, bleeding, dysrhythmia, and infection (usually of the drive line).
    - These patients are anticoagulated to prevent thrombotic events and therefore at risk of bleeding complications.
  - LVAD patients are often preload dependent. Consider that a fluid bolus may help reverse hypoperfusion.
  - Transport patient with ALL equipment including instructions, pumps, backup batteries, primary and secondary controllers, as well as all knowledgeable family members.
  - Treat non-LVAD related conditions per protocol.



LVAD SPECIALIST CONTACT (678)843-5879

Standards Procedure (Skill)

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.

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 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 220 mm Hg
   - Diastolic Blood Pressure greater than 120 mm Hg
   - Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
   - History of structural Central Nervous System disease (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 ineligable 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).

Restraints: Physical

Clinical Indications:

- Any patient who may harm themselves 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:

1. Ensure personnel and bystander safety
2. Attempt less restrictive means of managing the patient.
3. Request law enforcement assistance and **Contact Medical Control** for physical restraint orders.
4. Ensure that there are sufficient personnel available to physically restrain the patient safely.
5. 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.
6. 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.
7. 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.
8. 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.
9. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. **(Chemical restraint –Sedation Policy- may be considered earlier.)**
10. 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.

- Consider use of Reeves Sleeve or four point restraints as a means of restraint with authorization from medical control.

Standards Procedure (Skill)

Synchronized Cardioversion

Clinical Indications:

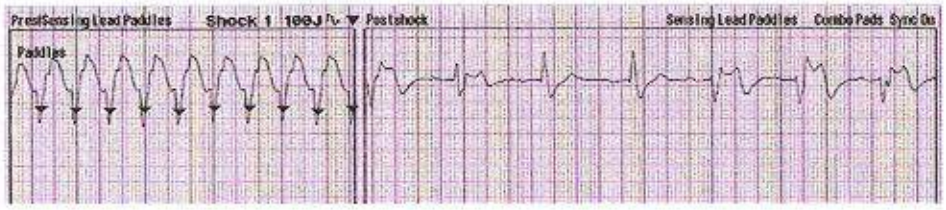
- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

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 unsucessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).

Synchronized Cardioversion

- Cardioversion is synchronized to avoid the refractory period of the T wave
- The monitor "plots" out the next refractory period in order to shock at the right moment – the safe R wave
  - With a QRS complex & T wave present, the R wave can be predicted (cannot work in VF – no wave forms present)



Standards Procedure (Skill)

Venous Access: External Jugular Access

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient ≥ 12 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.

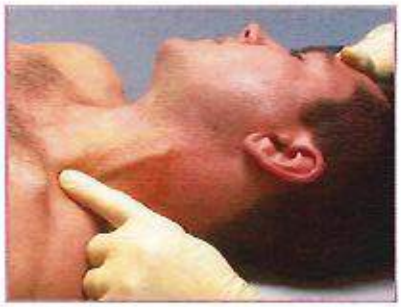
Procedure:

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.

Occlude venous return by placing a finger on the external jugular just above the clavicle.



EZ IO- Humeral Head

Identify the proximal humerus:

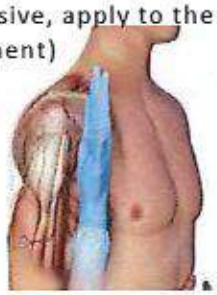
1) Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated)
2) Place your palm on the patient's shoulder anteriorly
   a) The area that feels like a "ball" under your palm is the general target area
   b) You should be able to feel this ball, even on obese patients, by pushing deeply
3) Place the ulnar aspect of one hand vertically over the axilla
4) Place the ulnar aspect of the opposite hand along the midline of the upper arm laterally.
5) Place your thumbs together over the arm.
   a) This identifies the vertical line of insertion on the proximal humerus
6) Palpate deeply as you climb up the humerus to the surgical neck.
   a) It will feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck
   b) The insertion site is on the most prominent aspect of the greater tubercle, 1 to 2 cm above the surgical neck

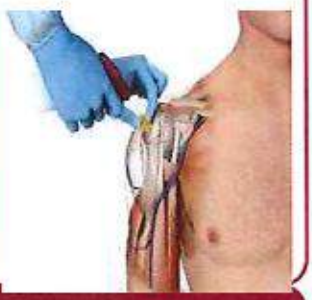
IO Drill has a green indicator light on the handle that indicates when dead. If light is green and seems sluggish then to much presser is being placed on drill.

Insertion:

1) Prepare the site by using antiseptic solution of your choice
2) Use a clean, "no touch" technique
3) Remove the needle cap
4) Point the needle set tip at a 45-degree angle to the anterior plane and posteromedial
5) Push the needle tip through the skin until the tip rests against the bone
6) The 5mm mark must be visible above the skin for confirmation of adequate needle length
7) Gently drill into the humerus 2cm or until the hub reaches the skin in an adult.
   a) The hub of the needle set should be perpendicular to the skin
8) Hold the hub in place and pull the driver straight off
9) Continue to hold the hub while twisting the stylet off the hub with counter clockwise rotations
   a) The needle should feel firmly seated in the bone (1st confirmation of placement)
10) Place the stylet in a sharps container
11) Place the EZ-Stabilizer™ dressing over the hub
12) Attach a primed EZ-Connect® extension set to the hub, firmly secure by twisting clockwise
13) Pull the tabs off the EZ-Stabilizer dressing to expose the adhesive, apply to the skin
14) Aspirate for blood/bone marrow (2nd confirmation of placement)
15) Secure the arm in place across the abdomen

TWO IV attempts must be made before establishing IO access.





Wound Care-Taser® Probe Removal

Clinical Indications:

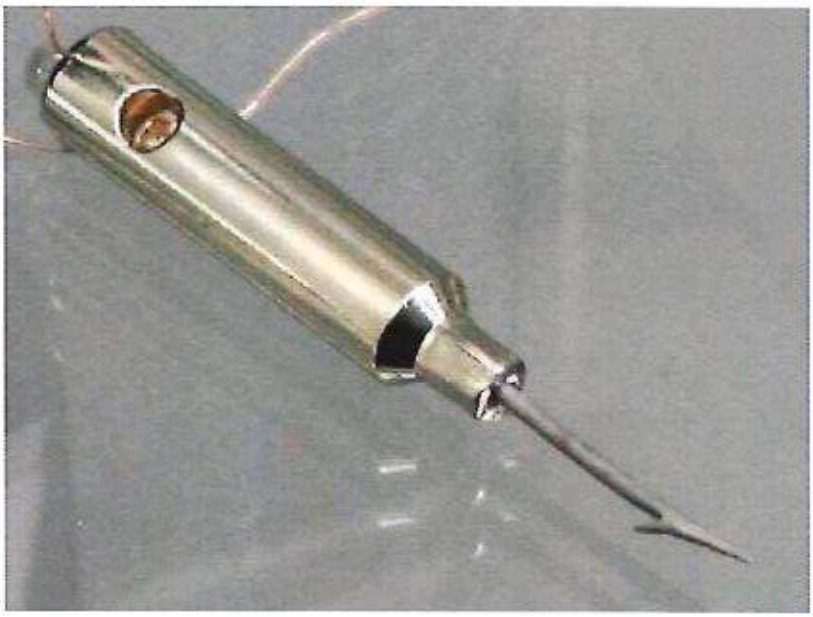
- Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

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 using dominant hand.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.



Standards Procedure (Skill)

Wound Care-Tourniquet

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.

Adenosine (Adenocard) P

Indications:	Supra-ventricular tachyarrhythmias (stable)
Adult Dose:	6 mg Rapid IVP followed with 10 -20 cc NS flush Repeat dose of 12 mg PRN X1 q 2 minute
Contraindications:	2nd or 3rd degree heart block Sick sinus syndrome WPW Hypersensitivity to adenosine
Pediatric Considerations:	0.1mg/kg initial Repeat 0.2 mg/kg
Precautions:	Some Asthma patients may experience bronchoconstriction
Adverse Effects:	Headache Dizziness Dyspnea Nausea/vomiting Chest pressure Transient asystole
Onset/Duration:	Immediate Onset 10 second duration
Classification:	Antidysrhythmic agent
Action:	Slows conduction through the A-V node, can interrupt the re-entry pathways through the A-V node
Notes:	Individuals with long term adjustment to nicotine or high doses of caffeine may require larger dose of Adenosine. Warn patient of unpleasant effects of medication PRIOR to administration

Albuterol (Proventil / Ventolin) B A P

Indications:	Treatment of Bronchospasm in patients with reversible obstructive airway disease Hyperkalemia Crush Syndrome
Adult Dose:	Respiratory Distress: May administer single dose 2.5mg IF patient is prescribed medication A P: 2.5 mg in 3cc NS via nebulizer, May initiate continuous Nebulizer for persistent distress. Max 10mg. Suspected Hyperkalemia/Crush Syndrome: 2.5mg – 5mg
Contraindications:	Known hypersensitivity Tachycardia (relative)
Pediatric Considerations:	2.5 mg initial, max 10 mg
Precautions:	Cardiovascular disease Hyperthyroidism Diabetes mellitus
Adverse Effects:	Tachycardia Palpitations Dysrhythmias Nausea Hypertension Dizziness Restlessness
Onset/Duration:	5 min onset 3-4 hour duration
Classification:	Bronchodilator Beta 2 adrenergic agonist
Action:	Relaxes bronchial smooth muscle by stimulating beta2 receptors resulting in bronchodilation. Also has stimulatory effect on Na+-K+ ATPase and the resultant intracellular shift of potassium
Notes:	

Amiodarone (Cordarone) P

Indications:	VF/pulseless VT; pulsed wide-complex tachycardia; monomorphic sustained VT; SVT.
Adult Dose:	VF/pulseless VT: 300mg IVP May repeat 150mg IVP x 1 in 5-10min. Max 450mg. VT, wide-complex tachycardia: 150mg IV piggyback over 10min (mix in D5W 100cc).
Contraindications:	Known hypersensitivity; cardiogenic shock; bradycardia with ventricular escape beats; marked sinus bradycardia; 2nd or 3rd-degree AV blocks. Antiarrhythmics are not indicated for prophylactic treatment of ectopy or as a prophylactic post-arrest. Do not use with medications that prolong QT interval (procainamide).
Pediatric Considerations:	VF/pulseless VT: 5mg/kg IV/IO. May repeat q 5-10min to max 15mg/kg. VT, wide-complex tachycardia: 5mg/kg IV/IO piggyback over 20-60min (mix in NS/D5W 100cc) (Do not repeat without medical control order.)
Precautions:	Dosing varies for specific arrhythmias, pay attention to dosing/concentration for specific patient age and clinical presentation. Lidocaine should be used for pulsed patients. If allergic to lidocaine or if lidocaine is not carried or if amiodarone has already been given, then administer amiodarone. May potentiate effects of oral anticoagulants, digoxin, antiarrhythmics and cyclosporine. Amiodarone will affect Lidocaine if the two agents are used together.
Adverse Effects:	Flushing; N/V; HA; tinnitus; blurred vision; dizziness; restlessness; confusion; tremors; numbness; hypotension; edema; CHF; dysrhythmias; SA node dysfunction; bradycardia (may be resistant to atropine and require pacing); Q-T prolongation; heart block; sinus arrest; abdominal pain; muscle twitching; seizures, respiratory depression. Phlebitis may occur at IV site with higher concentrations. May cause grayish-blue skin discoloration. Discontinue if significant adverse effects occur.
Onset/Duration:	Onset via IV 15min/half-life 40 days.
Classification:	Antiarrhythmic Class III
Action:	Suppresses ventricular ectopy, increases ventricular fibrillation threshold; increases cardiac refractory period without influencing resting membrane potential; relaxes vascular smooth muscle, reduces peripheral vascular resistance, and slightly increases cardiac index.
Notes:	Amiodarone will form precipitate in IV lines if combined with sodium bicarbonate. If sodium bicarbonate needs to be administered, after amiodarone flush IV line with NS 10-20cc.

Aspirin	B A P
Indications:	AMI Acute Angina
Adult Dose:	324 mg PO, must be chewed (half dose if patient has taken prescribed dose within 24hours)
Contraindications:	Allergy Intestinal bleed or gastric ulcers Blood clotting disorder Pregnancy or breast feeding
Pediatric Considerations:	Not indicated
Precautions:	
Adverse Effects:	Allergic reaction intestinal bleeding and GI irritation Nausea/vomit
Onset/Duration:	Onset 15 minutes for platelet aggregation Duration 3-4 hours
Classification:	Non-Steroidal Anti-inflammatory drug (NSAID)
Action:	Reduces platelet aggregation
Notes:	

Atropine (Atreza)	P
Indications:	Symptomatic bradycardia Organophosphate poisoning (OPP) Premedication for RSI Adults HR <60 Pediatric bradycardia
Adult Dose:	Bradycardia: 0.5- 1 mg IV / IO q 3-5 min to maximum of 3 mg Organophosphate Poisoning: 2 mg IV / IO q 3-5 minutes until heart rate >60 BPM or symptoms clear
Contraindications:	Non symptomatic bradycardia (Relative: Asthma, Myasthenia Gravis, narrow angle glaucoma)
Pediatric Considerations:	See Brose low .02 mg/kg, min dose 0.1mg max 0.5mg
Precautions:	If in setting of Myocardial Infarction do NOT give atropine is there is a wide complex rhythm. Will not be effective for Type II AV Block and new Third Degree Block with wide QRS complexes (In these patients may cause paradoxical slowing. Be prepared to pace).
Adverse Effects:	Tachycardia Increased myocardial 02 demand Dilated pupils Palpitations Nausea/vomiting Increased intraocular pressure
Onset/Duration:	2-5 minute onset 20 minute duration
Classification:	Parasympathetic Blocker (Anticholinergic) Antidysrhythmic agent
Action:	Blocks acetylcholine receptors, Decreases vagal tone resulting in increased heart rate and AV conduction, Dilates bronchioles and decreases respiratory tract secretions, Decreases gastrointestinal secretions and motility
Notes:	

Calcium Gluconate (Kalcinate)	P
Indications:	Hyperkalemia Crush Syndrome Dialysis/Renal Failure Overdose of calcium channel blockers
Adult Dose:	1-2g slow IV push
Contraindications:	Hypercalcemia
Pediatric Considerations:	See Broselow
Precautions:	Precipitates with sodium bicarbonate May increased dig toxicity Clear IV with 20cc NS before and after administration
Adverse Effects:	Bradycardia, hypotension, syncope
Onset/Duration:	5 to 15 minute onset duration is dose dependent; effects may persist for up to 4 hrs.
Classification:	Inotropic agent
Action:	Couples electrical and mechanical events of the myocardium Increases myocardial contractility Increases ventricular irritability
Notes:	Reduces the risk of ventricular fibrillation caused by hyperkalemia

Dextrose	A P
Indications:	Hypoglycemia Altered level of consciousness due to suspected or confirmed hypoglycemia
Adult Dose:	D10%: 250ml (25g) pre-mixed IV/IO solution initial dose, may repeat once However must be transported if repeated D50%: 50ml (25g) pre-mixed IV/IO push initial dose, may repeat once However must be transported if repeated
Contraindications:	Hyperglycemia
Pediatric Considerations:	D10%: 2-4ml/kg IV/IO, may repeat once (D10 concentration safe for all ages, no dilution necessary)
Precautions:	Causes tissue necrosis if injected into interstitial space May increase cerebral ischemia in CVA Caution with intracranial hemorrhage
Adverse Effects:	Thrombophlebitis Osmotic Diuresis Pulmonary Edema May worsen Wernicke's encephalopathy
Onset/Duration:	30 to 60 seconds onset duration depends on severity of hypoglycemia
Classification:	Hyperglycemic agent Hypotonic solution
Action:	Provide immediate source of glucose for rapid utilization for cellular metabolism
Notes:	If more than 25g administered patient must be transported. Refer to Glucose Management protocol for patient refusal guidelines. Dextrose 10% is preferred primary treatment as concentration is less harmful to vessels and surrounding tissue, decreasing possibility of tissue necrosis. Dextrose 50% is up to Paramedic discretion.

Diazepam (Valium) P

Indications:	Major motor seizures Status epilepticus Post Intubation sedation General sedation
Adult Dose:	5-10mg IV/IO/Rectal, may repeat once; max 10mg
Contraindications:	Respiratory depression Hypotension
Pediatric Considerations:	Seizures 0.1mg/kg IV/IO/Rectal over 2 minutes, or 0.5 mg/kg PR MAX DOSES: 5 mg in children and 10 mg in adolescents
Precautions:	Inject slowly, do not use small veins. Should not administer to patients in shock, coma or in acute alcoholic intoxication with depression of vital signs. Use caution in elderly patients.
Adverse Effects:	Hypotension Respiratory depression
Onset/Duration:	IV 1-5 minute onset, 15-60 minute duration
Classification:	Benzodiazepine
Action:	Suppresses spread of seizure activity through the motor cortex, skeletal muscle relaxant, reduces anxiety and causes sedation
Notes:	Intramuscular administration leads to widely variable absorption and should be avoided if possible.

Diltiazem (Cardizem) P

Indications:	A fib A flutter PSVT
Adult Dose:	20mg mixed in 100ml NS with 10gtts, given over 5-10 minutes
Contraindications:	Concurrent use of IV beta-blockers Wide complex tachycardia of unknown etiology Sick Sinus Syndrome WPW High Degree AV Blocks
Pediatric Considerations:	Not recommended in pediatric patients
Precautions:	Use cautiously in elderly patients, Congestive Heart Failure
Adverse Effects:	Arrhythmias Bradycardia Hypotension Heart Failure AV block Pulmonary edema
Onset/Duration:	2-10 minute onset 3-4 hour duration
Classification:	Calcium channel blocker
Action:	Inhibit calcium ion passage across cell membrane Slows SA and AV node conduction velocity Decreases myocardial contractility Decreases peripheral vascular resistance
Notes:	Potentiates with Beta-Blocker, Lithium, Tegretol, cyclosporins

Diphenhydramine (Benadryl)	B A P
Indications:	Anaphylaxis Allergic reactions Dystonia
Adult Dose:	25 to 50 mg IV/IO/IM/PO
Contraindications:	Known hypersensitivity Newborns Acute asthma COPD exacerbation Relative: narrow angle glaucoma
Pediatric Considerations:	1 mg/kg IV/IO/IM
Precautions:	Reduce dose for elderly
Adverse Effects:	Seizures Sedation Thickening of Bronchial Secretions
Onset/Duration:	IV administration has immediate onset 6 to 8 hour duration
Classification:	Antihistamine
Action:	Prevents but does not reverse histamine mediated responses, suppresses cough reflex
Notes:	

Dopamine (Intropin) P

Indications:	Cardiogenic shock Vasogenic shock Neurogenic shock Sepsis Refractory Hypotension Bradycardia
Adult Dose:	2-10 mcg/kg/min: IVD, then titrate to effect
Contraindications:	Tachydysrhythmias Hypovolemic shock
Pediatric Considerations:	2-10mcg/kg/min IVD Epinephrine is pressor of choice in pediatric shock
Precautions:	Titrate to blood pressure
Adverse Effects:	Angina, Ectopy, Headache, Tachydysrhythmias, VT/VF, Increased myocardial ischemia, AMI, Hypertension
Onset/Duration:	Less than 5 min onset Less than 10 min duration
Classification:	Sympathomimetic
Action:	Dopamine has the following dose related effects: 1-2 mcg/kg/min: dilates renal and mesenteric blood vessels (no effect on heart rate or blood pressure) 2-10 mcg/kg/min: beta effects on heart usually increase cardiac output without increasing heart rate. 10-20 mcg/kg/min: alpha peripheral effects cause peripheral vasoconstriction and increased blood pressure.
Notes:	Mix: 400 mg in 250 ml NS or 800 mg in 500ml NS to produce concentration of 1600 mcg/ml. Use 60gtts IV admin set only, all doses in micro drops per minute. Drip calculation: 1600mcg/1ml. 2-10 mcg/kg/min. (example: 220lb pt. = 100kg. 100kgx5mcg=500mcgx60gtt=30,000. 30,000/1600mcg= 18.75 or 19gtt/min)

Dopamine Drip Chart

Ensure you have 1,600mcg/ml Concentration for this chart - Mix 400mg Dopamine in 250ml
Then use a 60gtts set and deliver the number indicated below by drops per minute (or ml/hr)

MCG/KG/MIN	Patients Weight in KG															
	2.5	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Patients Weight in LBS															
	6	11	22	44	66	88	110	132	154	176	198	220	243	265	287	309
2 mcg	0	0	1	2	2	3	4	5	5	6	7	8	8	9	10	11
5 mcg	0	1	2	4	6	8	9	11	13	15	17	19	21	23	24	26
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38	41	45	49	53
15 mcg	1	3	6	11	17	23	28	34	39	45	51	56	62	68	73	79
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75	83	90	98	105

Epinephrine (Adrenalin)

R B A P M

Indications:	Cardiopulmonary arrest: ventricular fibrillation pulseless ventricular tachycardia pulseless electrical activity asystole Anaphylaxis Status Asthmaticus Profound Refractory Hypotension
Adult Dose:	Cardiopulmonary arrest: 1 mg 1:10,000 q 3 to 5 minutes IV / IO Anaphylaxis: 0.3 mg of 1:1000 IM, may repeat once Consider IV (1:10,000); dosage as ordered ONLINE MEDICAL CONTROL Respiratory Distress: 0.5 mg of 1:1000 IM Profound Refractory Hypotension: 2-10 mcg/min IV infusion (2mg in 250ml NS, yields 8mcg/ml. Use 60gtt. 15gtts/min=2mcg. 30gtts/min=4mcg. 45gtts/min=6mg. 60gtts/min=8mg. Racemic Epi: .5mg in 2ml NS nebulized X1
Contraindications:	None relative
Pediatric Considerations:	Cardiac arrest: 0.01mg/kg 1:10,000 IV; see broselow tape Anaphylaxis/respiratory: 0.01mg/kg 1:1000 IM max 0.3mg, may repeat once Consider IV (1:10,000); 0.01mg/kg max of 0.5 with ONLINE MEDICAL CONTROL Racemic Epi: .5mg in 2ml NS nebulized
Precautions:	Use caution when given IV in anaphylactic shock as myocardial ischemia and or cardiac arrest may occur.
Adverse Effects:	Hypertension Tachycardia Increased myocardial oxygen demand
Onset/Duration:	Onset: Immediate if given IVP / 5-10 minutes IM Duration: 3-5 minutes IVP / 20 minutes IM
Classification:	Sympathomimetic agent (catecholamine)
Action:	Beta effect is more profound than Alpha effect
Notes:	Epinephrine is the pressor of choice in the case of pediatric shock states. Dopamine may be ineffective.

Etomidate (Amidate)	P
Indications:	Induce sedation to facilitate intubation.
Adult Dose:	See RSI Chart
Contraindications:	Hypersensitivity Pregnancy
Pediatric Considerations:	None
Precautions:	Do not re-dose with etomidate. Long term use can cause decreased corticosteroid production.
Adverse Effects:	Myoclonic skeletal muscle movement, apnea, hyperventilation, laryngospasm, dysrhythmias, nausea, vomiting, eye movement, hiccups, snoring, seizures
Onset/Duration:	15-20 seconds onset 3-5 minutes duration * short ½ life.
Classification:	Hypnotic, non-sedative, non-narcotic, non-analgesic
Action:	Ultra-short acting, nonbarbituate hypnotic. Produces rapid induction of anesthesia with minimal cardiorespiratory effects. Rapidly distributed following iv injection/ rapidly metabolized and excreted. (note extremely short duration)
Notes:	MUST Use sedative (Ativan/ versed) for intubation maintenance.

Fentanyl (Sublimaze) P

Indications:	Analgesia
Adult Dose:	2 mcg/kg IV/IO/IM/IN max of 100mcg initial dose. May repeat to max of 200mcg
Contraindications:	Known hypersensitivity
Pediatric Considerations:	1 mcg/kg IV/IO/IM/IN max of 50mg initial dose. May repeat to max of 100mcg
Precautions:	Head injuries, COPD, ALOC, Hypotension
Adverse Effects:	CNS depression, resp. depression, hallucinations, arrhythmias, n/v, constipation, Chest wall rigidity
Onset/Duration:	1-2min IV, 7-15min IM Duration- ½ - 1hr IV, 1-2hr IM
Classification:	Opioid agonist/ narcotic analgesic
Action:	Binds to opiate receptors as an agonist to alter pt.'s perception of painful stimuli.
Notes:	Physicians signature required for all patients receiving pain management, regardless of OLMC contact. CNS and resp. depressant effects are similar to Morphine. Minimal hemodynamic side effects. Drug has little hypnotic activity and rarely causes histamine release.

*Each dose should be weight based, if you decided to give a lower dose Medical Control must be contacted for orders.

Glucagon (Glucagen)

A P

Indications:	Hypoglycemia, Beta-blocker OD
Adult Dose:	Hypoglycemia- 1mg IM / IN Patient must be transported Beta-blocker OD- 1mg IM / IN
Contraindications:	None in emergency setting
Pediatric Considerations:	Dose: 0.5-1mg/kg up to 1mg IM/IN
Precautions:	Do not dilute with saline solutions, will form a precipitate.
Adverse Effects:	Nausea & Vomiting, hyperglycemia, hypersensitivity reactions
Onset/Duration:	Onset is 5-20 minutes, peak effect at 30 minutes. Duration is 1-1.5 hours
Classification:	Polypeptide hormone
Action:	Accelerates liver glycogenolysis and inhibits glycogen synthetase resulting in blood glucose elevation. Stimulates hepatic gluconeogenesis and causes an inotropic myocardial effect. Relaxes GI smooth muscle
Notes:	Reconstitute powdered solution with supplied diluent only

Glucose Oral (Glucose Paste) B A P

Indications:	Hypoglycemia in conscious pt. that is able to swallow.
Adult Dose:	One tube PO- between cheek and gum
Contraindications:	Unconsciousness, inability to swallow, hyperglycemia
Pediatric Considerations:	One tube PO
Precautions:	Not tasty, watch for spitting
Adverse Effects:	Choking if not properly administered
Onset/Duration:	15 min, up to 2 hours duration
Classification:	Carbohydrate
Action:	Rapidly metabolized source of calories in pt.'s with inadequate oral intake.
Notes:	Perform glucose check before and after administration of Glucose. Follow with complex carbohydrate if leaving patient at home.

Ipratropium (Atrovent / Ipramide)	P
Indications:	Bronchospasm due to reactive airway diseases Organophosphate poisoning
Adult Dose:	0.5 mg via nebulizer x1 Can be initial dose if allergy to Albuterol, or mixed with 2.5mg Albuterol (DuoNeb) for second respiratory nebulizer treatment
Contraindications:	Known Hypersensitivity
Pediatric Considerations:	0.25 mg SVN
Precautions:	Should be used with caution in patients with narrow-angle glaucoma.
Adverse Effects:	Anxiety Palpitations Nausea/ vomiting Onset/Duration:
Onset/Duration:	15-30 minute onset 5-7 hour duration
Classification:	Anticholinergic bronchodilator
Action:	Blocks acetylcholine receptors Dries respiratory tract secretions Reduces bronchospasm
Notes:	

Ketamine (Ketalar) P

Indications:	Induction agent for pharmacologically assisted intubation
Adult Dose:	2mg/kg IV/IO Use in conjunction with 1 second spray Cetacaine (topical anesthetic used for gag suppression to facilitate intubation. Onset 30 seconds, duration 30-60 minutes.)
Contraindications:	Severe Hypertension, Severe Hyperthermia...be prepared to cool immediately
Pediatric Considerations:	None
Precautions:	Increased blood pressure due to catecholamine release. Reemergence phenomenon. As with any intubated patient, continued sedation must be provided before the induction agent has worn off. Increased intracranial pressure (ICP) has been a theoretical concern, however studies have not shown a significant increase in ICP with the use of ketamine and therefore it is felt to be an appropriate induction agent for patients with possible increased ICP, unless they have markedly elevated blood pressure.
Adverse Effects:	Laryngospasm, hyper salivation, nausea/vomiting, arrhythmias, emergence delirium, hallucinations, elevated BP, hypotension, documentation or observation of worsening hyperthermia
Onset/Duration:	IV 30 sec; duration 5-10 min for 2 mg/kg Duration: 12-25 min
Classification:	General dissociative anesthetic
Action:	Dissociative anesthetic agent, structurally similar to phencyclidine (PCP), which interrupts the connection between the thalamoneocortical tracts and the limbic system. In addition, it stimulates many different receptors, including the opioid and catecholamine receptors. It is unique among sedative agents in that it also provides analgesia in addition to the amnestic and sedative effects. The sympathomimetic effects cause an increase in heart rate, blood pressure, and cardiac output. It is also a bronchodilator, and thus may be beneficial in patients with bronchospasm requiring intubation.
Notes:	When elevated ICP is suspected, consider using a lower dose along with midazolam. Avoid in patients with severely elevated blood pressure; May increase respiratory secretions. Consider adjuvant use of anti-sialagogue such as atropine minimum dose 0.1mg.

Lidocaine (Xylocaine) P

Indications:	First line antiarrhythmic in pregnancy VT/VF VT with pulse symptomatic PVCs RSI with suspected closed head injuries
Adult Dose:	VF/VT- 1.5mg/kg IV / IO q 5-10 min. Max 3 mg/kg. VT w/ pulse- 1 -1.5mg/kg IV/ IO, then 0.5-0.75mg/kg q 5-10 min. up to 3 mg/kg Run of 6 or more Symptomatic PVC's- 2-4mg/min infusion pre-mixed bag. RSI- 1 -1.5mg/kg IV/IO
Contraindications:	High degree heart blocks hypotension Stokes-Adams syndrome WPW SVT Bradycardias
Pediatric Considerations:	VF/VT- 1mg/kg IV / IO q 10 min. Max 3 mg/kg VT w/ pulse- 1mg/kg IV/ IO, q 10 min. up to 3 mg/kg RSI- 1mg/kg IV/IO
Precautions:	Caution in use with pts >70 y/o or with liver or renal disease, CHF, respiratory depression, shock. Reduce maintenance infusion by 50%
Adverse Effects:	Seizures, slurred speech, altered mental status
Onset/Duration:	45-90 seconds Duration- 10-20 minutes
Classification:	Amide derivative, antiarrhythmic
Action:	As an antiarrhythmic, it suppresses automaticity and shortens the effective refractory period and action potential duration of His-Purkinje fibers and suppresses spontaneous ventricular depolarization during diastole by altering sodium permeability through cellular fast channel membranes. The drug acts preferentially on diseased or ischemic myocardial tissue, exerting its effect on the conduction system by inhibiting re-entry mechanisms and halts ventricular arrhythmias.
Notes:	

Magnesium Sulfate (MgSO4) P

Indications:	Eclamptic seizures Torsades de Pointes refractory VF/VT
Adult Dose:	Torsades de Pointes /VF/VT: 1-2g IVP Eclamptic SZ: 4g IVP over 2-3 minutes
Contraindications:	Renal disease, heart block, hypermagnesemia
Pediatric Considerations:	None
Precautions:	Caution should be used in patients receiving digitalis as it may cause severe hypotension or cardiac arrest. Calcium chloride should be readily available as an antidote if respiratory depression results from treatment.
Adverse Effects:	hypotension, respiratory depression, bradycardia, dysrhythmias, cardiac arrest, CNS depression, flushing, sweating
Onset/Duration:	1-5 min onset approximately 30 min duration Classification: Electrolyte, anticonvulsant, antidysrhythmic
Classification:	electrolyte
Action:	Decreases acetylcholine at neuromuscular junction (motor end plate), which is responsible for anticonvulsant properties; reduces SA node impulse formation and prolongs conduction time in the myocardium; Attracts and retains water in the intestinal lumen which distends the bowel to promote mass movement and relieve constipation
Notes:	Potentiates neuromuscular blockade produced by nondepolarizing paralytics (Rocuronium/Zemuron, Vecuronium/ Norcuron)

Methylprednisolone (Solu-Medrol)	P
Indications:	Allergic reaction Anaphylaxis Upper airway burns
Adult Dose:	125 mg IV / IO / IM
Contraindications:	Preterm infants, Newborn, systemic fungal infections
Pediatric Considerations:	2 mg/kg IV / IO / IM
Precautions:	Use with caution in patients with G.I. bleeding, diabetes mellitus & severe infection
Adverse Effects:	Alkalosis, CHF, headache, hypertension, hypokalemia, seizures, nausea and vomiting
Onset/Duration:	20 minutes-2 hours, Duration: 18-36 hours
Classification:	Corticosteroid, glucocorticoid steroid, anti-inflammatory
Action:	Decreases inflammation by depressing migration of polymophonuclear leukocytes and activity of endogenous mediators of inflammation. Potentiates vascular smooth muscle relaxation by beta adrenergic agonists.
Notes:	Hypoglycemic responses to insulin and oral hypoglycemic agents may be blunted. Potassium depleting agents may potentiate hypokalemia induced by corticosteroids.

Metoprolol (Lopressor) P

Indications:	Cardiac dysrhythmias
Adult Dose:	5mg IV slow push, repeat x1. Max dose 10mg.
Contraindications:	Documented hypersensitivity Uncompensated congestive heart Failure cardiogenic shock AV conduction abnormalities Asthma Bradycardia Pediatric
Pediatric Considerations:	Not indicated
Precautions:	During IV administration, carefully monitor blood pressure, heart rate, and ECG. Goal of treatment is to reduce heart rate to 60-90 beats/min.
Adverse Effects:	Hypotension, CHF, Dizziness, chest pain, headache, Bronchospasm, Bradycardia
Onset/Duration:	immediate, peaks in 20 minutes IV / Duration 5-8 hours
Classification:	Beta-blocker
Action:	Selective beta-1-adrenergic receptor blocker that decreases the automaticity of contractions (and thus heart rate). Negative inotropic and chronotropic effects are manifested by slowed AV conduction, antidysrhythmic effects, and decreased myocardial oxygen demand.
Notes:	Use of Calcium channel blockers may potentiate side effects/adverse effects; toxicity of metoprolol may increase with coadministration of phenothiazines and calcium channel blockers; metoprolol may increase toxicity of digoxin, flecainide, clonidine, epinephrine, nifedipine, prazosin, verapamil, and lidocaine

Midazolam (Versed) P

Indications:	RSI induction Seizure chemical restraint (sedation protocol) Procedural sedation
Adult Dose:	RSI: 2.5-5mg IV/IO over 2 minutes, max dose 5mg Chemical restraint: 5mg-10mg IM/IV/IN over 2 min, repeat x1 max dose 10mg Seizure: 2.5-5 mg IV/IM/IO/IN, max dose 10mg, may repeat once Procedural sedation: 1-2mg IV/IM/IO/IN
Contraindications:	Hypersensitivity OD of alcohol or other CNS depressants depressed vital signs / hypoperfusion acute narrow angle glaucoma Pregnancy (crosses placental barrier, can depress fetal VS)
Pediatric Considerations:	0.1mg/kg IV/IO/IM dose 0.2mg/kg IN dose (refer to pediatric seizure protocol dose chart)
Precautions:	Use caution in patients with renal impairment, history of COPD; may wish to double the IV dose when administering IM
Adverse Effects:	Respiratory depression or arrest, Hypotension, bradycardia, HA, N/V, pain at injection site, hiccups
Onset/Duration:	Onset IV/ IO: 1-3 min IM: approx. 10-20 min duration of action is dose dependent
Classification:	Benzodiazepine, CNS depressant, anticonvulsant, amnestic, muscle relaxant
Action:	Potentiation of gamma aminobutyric acid (GABA) by binding to specific benzodiazepine receptors in the CNS; may act on limbic system and on the reticular formation
Notes:	First line medication for seizure treatment of all ages. May administer max dose of versed administration and then initial dose of second benzo if needed, prior to medical control contact. If another is needed contact medical control.

Morphine Sulfate (Morphine) P

Indications:	Pain management Analgesia Pulmonary edema Acute Myocardial Infarction
Adult Dose:	0.1mg/kg max 5mg initial; May repeat to a max of 10mg
Contraindications:	Head injury, exacerbated COPD, depressed respiratory drive, hypotension, ALOC
Pediatric Considerations:	0.1 mg/kg max 5mg initial; May repeat to a max of 10mg
Precautions:	Patients with acute bronchial asthma, chronic pulmonary diseases, severe respiratory depression, and pulmonary edema induced by chemical irritants
Adverse Effects:	Respiratory depression, hypotension, ALOC, nausea & vomiting
Onset/Duration:	IV immediate onset, peak effect 20 min. IM/SQ 15-30 min., peak effect 30-60 min. Duration 2-7 hours
Classification:	Narcotic analgesic
Action:	Narcotic agonist with activity at u-receptors (supraspinal analgesia, euphoria, respiratory and physical depression), K-receptors (sedation and myosis), and delta-receptors (dysphonia, hallucinations, respiratory and vasomotor stimulation)
Notes:	Physicians signature required for all patients receiving pain management, regardless of OLMC contact. Naloxone and respiratory equipment should be immediately accessible

*Each dose should be weight based, if you decided to give a lower dose Medical Control must be contacted for orders.

Naloxone (Narcan)	R B A P
Indications:	Suspected or Known narcotic overdose Altered level of consciousness with respiratory depression
Adult Dose:	0.4 - 2mg IM/IV/IO/IN single dose; may repeat as needed to maintain patent airway and respirations
Contraindications:	None in the emergent setting
Pediatric Considerations:	0.1 mg/kg IM/IV/IO/IN Max dose 2 mg single dose; may repeat as needed Use caution in newborns
Precautions:	Rapid reversal of narcotic effects may lead to combative behavior and vomiting. May not reverse hypotension. For patients with chronic pain issues. Administer 0.4 mg increments until respirations improve. Be cautious of severe GI and behavioral problems post-acute narcotic reversal.
Adverse Effects:	Hypertension , Nausea, Vomiting, Tremors, Dysrhythmias
Onset/Duration:	IV/IO/IN immediate IM 5-10 minutes 20-30 minute duration
Classification:	Narcotic Antagonist
Action:	Competitively binds with opiate receptor sites in the CNS
Notes:	Administration of naloxone is limited only to improving respiratory drive in the unconscious patient.

Nitroglycerin (NitroStat)	R B A P
Indications:	ACS Acute angina AMI CHF with pulmonary edema
Adult Dose:	0.4 mg SL q 3-5 minutes SBP >90 and patient is symptomatic Paste: 1 inch, use paper guide
Contraindications:	SBP <90 Inferior MI or MI with right side involvement Intracranial bleeding/head trauma Within 24 hours of erectile dysfunction or pulmonary hypertension medication Suldenafil (Viagra/Revation) or Vardenafil (Levitra) Tadalafil (Cialis)
Pediatric Considerations:	Not indicated
Precautions:	Will cause severe loss of blood pressure if administered to a patient experiencing an inferior MI. Use caution in patients with valvular stenosis due to high probability of decreased ejection fraction.
Adverse Effects:	Hypotension, HA, syncope, reflex tachycardia, skin flushing
Onset/Duration:	Onset immediate, 0-3 minutes duration up to 30 minutes
Classification:	Nitrate
Action:	Causes relaxation of the vascular smooth muscle via stimulation of intracellular cyclic guanosine monophosphate production. This results in decreased preload, afterload, blood pressure, left ventricular workload and myocardial oxygen demand. Relaxes esophageal smooth muscle.
Notes:	Aspirin may increase nitrate serum concentrations; marked symptomatic hypotension may occur with co-administration of calcium channel blockers or beta-blockers (dose adjustment of either agent may be necessary)

Nitrous Oxide (Nitronox)	P
Indications:	Acute pain due to orthopedic trauma (i.e. soft tissue injury or suspected fracture), renal colic, burns, abdominal pain (not due to suspect bowel obstruction), moderate to severe pain, anxiety, apprehension
Adult Dose:	Instruct the patient to inhale deeply through the demand valve and mask or mouth piece
Contraindications:	Head injury, Chest injury, Abdominal pain, pregnancy, COPD, ETOH or drug intoxication
Pediatric Considerations:	Instruct the patient to inhale deeply through the demand valve and mask or mouth piece
Precautions:	Pregnancy safety: nitrous oxide increases the incidence of spontaneous abortion. Ventilate patient area during use, nitrous oxide is a non-flammable and non-explosive gas, nitrous oxide is ineffective in 20% of the population
Adverse Effects:	Drowsiness, Dizziness , Nausea/Vomiting
Onset/Duration:	onset: 2 - 5 minutes duration: 2 – 5 minutes
Classification:	Inhaled gaseous analgesic and general anesthetic
Action:	Inhibits GABA receptors within pain centers of the brain and spinal cord, increasing inhibition of nerve cells causing drowsiness and sleep
Notes:	

Ondansetron (Zofran)	P
Indications:	Nausea/ vomiting
Adult Dose:	4-8mg IV/IM Slow IV or IM; may repeat 1x max dose 8mg
Contraindications:	Hypersensitivity, liver disease (reduce dose)
Pediatric Considerations:	0.1 mg/kg IV/IM; may repeat 1x Recommended for use in children greater than 2 years of age
Precautions:	Maintain lower dose with amiodarone Maintain lower dose with liver disease
Adverse Effects:	Rare hypersensitivity, fatigue, pyrexia, dizziness, headache, constipation, urinary retention.
Onset/Duration:	Rapid onset duration 5 hours
Classification:	Antiemetic
Action:	Selective serotonin blocking agent
Notes:	May precipitate with Sodium bicarbonate Consider administration with/prior to narcotic administration

Promethazine (PHENERGAN) P

Indications:	Nausea/ vomiting
Adult Dose:	12.5mg IV/IM If administering IV dilute in Normal Saline (50/100ml) via a free flowing line
Contraindications:	Patients who have received large amounts of depressants
Pediatric Considerations:	0.5 mg/kg • Recommended for use in children greater than 2 years of age • IM route preferred over IV
Precautions:	Promethazine should also be avoided in patients who already exhibit a decreased level of consciousness.
Adverse Effects:	Rare hypersensitivity, fatigue, tachycardia, bradycardia, dizziness, headache, extra-pyramidal side effects (EPS) such as tremor, slurred speech, akathisia (restlessness) and dystonia (involutory muscle contractions)
Onset/Duration:	Rapid onset /. Duration 4 hours
Classification:	Antiemetic
Action:	Increases acetylcholine actin on GI smooth muscle
Notes:	Promethazine may cause sedation and respiratory depression when combined with alcohol, barbiturates, other phenothiazines, sedatives and narcotics. It may also cause excessive anticholinergic side effects when combined wuth antihistamines.

Rocuronium (Zemuron)	P
Indications:	Need for aggressive airway control and maintenance using RSI
Adult Dose:	See RSI Chart
Contraindications:	Muscular disorders Known hypersensitivity
Pediatric Considerations:	Not indicated
Precautions:	Not recommended for RSI in Caesarean patients or those over 65 years of age.
Adverse Effects:	Hypotension Altered mental status Increases pulmonary resistance
Onset/Duration:	Onset: 60-70 seconds Duration: 20+ minutes
Classification:	Nondepolarizing neuromuscular blocker
Action:	Neuromuscular blockade (Paralysis)
Notes:	Airway control equipment must be readily available. Intubation conditions expected in 1-2 minutes after injection. Consider lower doses in extremely debilitated patients. Sodium

Sodium Bicarbonate	P
Indications:	Suspected hyperkalemia TCA OD with ECG changes of prolonged QT or QRS Crush Syndrome Consider in prolonged arrest
Adult Dose:	8.4% - 1 mEq/kg IV/IO
Contraindications:	None in emergency setting
Pediatric Considerations:	8.4% - 1 mEq/kg IV/IO
Precautions:	Do not administer in the same IV with calcium gluconate, will precipitate. Prepare to ventilate patient.
Adverse Effects:	Metabolic alkalosis, electrolyte imbalance, fluid overload
Onset/Duration:	Immediate if IV, onset is less than 15 min Duration 1-2 hours
Classification:	Alkalizing agent
Action:	Agent that dissociates to provide bicarbonate ion to buffer hydrogen ions in order to raise the pH level to reverse acidosis. It has also been found beneficial in the event of drug overdose in order to force urine alkalization/diuresis, membrane stabilization of cardiac cells as well, and electrolyte balance restoration.
Notes:	Most catecholamines and vasopressors (dopamine, epinephrine) can be deactivated by alkaline solutions like sodium bicarbonate. When administered with calcium gluconate, a precipitate may form that will clog the IV line.

Succinylcholine (Anectine) P

Indications:	RSI to facilitate tracheal intubation, and to provide skeletal muscle relaxation.
Adult Dose:	See RSI chart
Contraindications:	Hyperkalemia Burns between 24hrs-2 weeks old Neuromuscular disease: myasthenia gravis, amyotrophic lateral sclerosis, Muscular dystrophy, Guillain-Barre syndrome Renal failure patients who have not had hemodialysis within past 24 hrs. Known hyperkalemia Patient or family history of malignant hyperthermia
Pediatric Considerations:	Not indicated
Precautions:	
Adverse Effects:	Respiratory depression Anaphylaxis Hypotension Hyperkalemia Dysrhythmias Apnea Hypertension Renal Failure Increased intraocular pressure Malignant hyperthermia
Onset/Duration:	Onset: 1 minute Duration: 4-6 minutes
Classification:	Depolarizing neuromuscular blocking agent
Action:	Short-acting depolarizing-type, skeletal muscle relaxant
Notes:	

Vecuronium (Norcuron)	P
Indications:	Paralysis to facilitate intubation
Adult Dose:	See RSI chart
Contraindications:	Newborn infants, myasthenia gravis
Pediatric Considerations:	Not indicated
Precautions:	Patient must be sedated
Adverse Effects:	Apnea
Onset/Duration:	Onset 1-2 minutes/ Duration 30 minutes
Classification:	Nondepolarizing neuromuscular blocking agent
Action:	Prevents acetylcholine from binding to receptors on the motor end plate, thus blocking depolarization.
Notes:	

Ziprasidone (Geodon) P

Indications:	Behavioral Emergencies/Sedation Used to treat acute manic episodes associated with schizophrenia, bipolar, mania
Adult Dose:	10-20mg IM; max 20mg should be mixed with 1.2ml of normal saline
Contraindications:	Long QT syndrome (TDP) Recent MI Heart Failure Dementia/Alzheimer's
Pediatric Considerations:	Not indicated
Precautions:	Given IM only
Adverse Effects:	Can prolong QT interval Dystonia Dizzy Tachydysrhythmias Heart failure Syncope
Onset/Duration:	Onset: 15-20 minutes Duration: 2-5 hours
Classification:	Antipsychotic
Action:	Alters the effects of chemicals within the brain. Combination of dopamine type 2 (D2) and serotonin type 2 (5HT2) antagonism.
Notes:	

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South Carolina Approved Skills by Certification Level

The following checklist provides the approved Skills / Scope of practice for all levels of certification within South Carolina as deemed appropriate by the Department and the South Carolina Medical Control Committee. Please note the EMR level of care is supplied as a reference only whereas the Department has regulatory authority over the EMT Basic and above levels of care.

Skill - Airway/Ventilation/ Oxygenation	EMR	EMT	AEMT	PARAMEDIC	CCP / FP
Airway – supraglottic (BIAD)		X	X	X	X
Airway – nasal		X	X	X	X
Airway – oral	X	X	X	X	X
Bag-valve-mask (BVM)	X	X	X	X	X
BiPAP/CPAP		X	X	X	X
Chest decompression - needle				X	X
Chest tube placement – assist only				X	X
Chest tube – monitoring and management				X	X
Cricoid pressure (Sellick's Maneuver)	X	X	X	X	X
Cricothyrotomy – needle				X	X
Cricothyrotomy – percutaneous				X	X
Demand valve – manually triggered ventilation		X	X	X	X
End tidal CO2 monitoring/capnography		X	X	X	X
Gastric decompression – NG Tube				X	X
Gastric decompression – OG Tube				X	X
Head tilt - chin lift	X	X	X	X	X
Intubation – nasotracheal				X	X
Intubation - orotracheal				X	X
Jaw-thrust	X	X	X	X	X
Jaw-thrust - Modified (trauma)	X	X	X	X	X
Mouth-to-barrier	X	X	X	X	X
Mouth-to-mask	X	X	X	X	X
Mouth-to-mouth	X	X	X	X	X
Mouth-to-nose	X	X	X	X	X
Mouth-to-stoma	X	X	X	X	X

Obstruction – direct laryngoscopy				X	X
Obstruction – Manual	X	X	X	X	X
Oxygen therapy – Humidifiers		X	X	X	X
Oxygen therapy – Nasal cannula	X	X	X	X	X
Oxygen therapy – Non- rebreather mask	X	X	X	X	X
Oxygen therapy – partial rebreather mask	X	X	X	X	X
Oxygen therapy – simple face mask	X	X	X	X	X
Oxygen therapy – Venturi mask	X	X	X	X	X
Pulse oximetry	X	X	X	X	X
Suctioning – Upper airway	X	X	X	X	X
Suctioning – tracheobronchial			X	X	X

Skill – Advanced Airway/Ventilation/ Oxygenation	EMR	EMT	AEMT	PARAMEDIC	CCP / FP
Ventilator – Automated Analog or Digital Transport (AATV / ADTV) BiAD or Stoma with no other interventions		X	X	X	X
Ventilator – Automated Digital Transport (ADTV) Endotracheal tube				X	X
Trachea tube replacement / change				X	X

Skill-Cardiovascular/Circulation	EMR	EMT	AEMT	PARAMEDIC	CCP / FP
Cardiac monitoring – (Any Interpretive)				X	X
12-lead placement, capture and transmission only		X	X		
Cardiopulmonary resuscitation (CPR)	X	X	X	X	X
Cardioversion – electrical				X	X
Carotid massage				X	X
Defibrillation – automated / semi-automated	X	X	X	X	X
Hemorrhage control – direct pressure	X	X	X	X	X
Hemorrhage control – tourniquet	X	X	X	X	X
Internal; cardiac pacing – monitoring only				X	X
Mechanical CPR device		X	X	X	X
Transcutaneous pacing - manual				X	X
Accepted Vagal Man.				X	X
Balloon pump operation / transport				X***	X

Skill-Immobilization	EMR	EMT	AEMT	PARAMEDIC	CCP / FP
Spinal motion restriction – cervical	X	X	X	X	X
Spinal immobilization – long board	X	X	X	X	X
Spinal immobilization – manual	X	X	X	X	X
Spinal immobilization – seated patient (KED, etc)	X	X	X	X	X
Spinal immobilization – rapid manual extrication	X	X	X	X	X
Extremity stabilization - manual	X	X	X	X	X
Extremity splinting	X	X	X	X	X
Splint – traction		X	X	X	X
Mechanical patient restraint		X	X	X	X
Emergency moves for endangered patients	X	X	X	X	X

Skill-Medication Administration Routes	EMR	EMT	AEMT	PARAMEDIC	CCP / FP
Aerosolized/nebulized (beta agonist)		X	X	X	X
Buccal		X	X	X	X
Endotracheal tube			X	X	X
Inhaled – self-administered (nitrous			X	X	X
Intranasal (naloxone)	X	X	X	X	X
Intravenous push (dextrose solutions)			X	X	X
Intravenous piggyback				X	X
Nasogastric					X
Oral (glucose)		X	X	X	X
Oral (aspirin)		X	X	X	X
Oral (Acetaminophen)		X	X	X	X
Oral (Ibuprophen)		X	X	X	X
Rectal				X	X
Sublingual (nitroglycerin)		X	X	X	X
ChemBio Auto-injector (self or peer care)	X	X	X	X	X
Intramuscular Epinephrine Kit		X	X	X	X
Auto-injector (patient's own prescribed meds)		X	X	X	X
Epi-pen Administration (for anaphylaxis only)	X	X	X	X	X
Transdermal Med Admin.				X	X
Opthalmic Med Admin.				X	X
IV/Intraosseous Meds			X	X	X

Skill - – IV Initiation/Maintenance Fluids	EMR	EMT	AEMT	PARAMEDIC	CCP / FP
Access indwelling catheters and implanted central IV ports				X	X
Central line – monitoring				X	X
Intraosseous – initiation			X	X	X
Intravenous access			X	X	X
Intravenous initiation - peripheral			X	X	X
Intravenous – maintenance of non-		X	X	X	X
Intravenous – maintenance of medicated IV fluids				X	X
Maintenance of Blood Products (Initiation NOT authorized)				X	X

Skill - Miscellaneous	EMR	EMT	AEMT	PARAMEDIC	CCP / FP
Assisted delivery (childbirth)	X	X	X	X	X
Blood glucose monitoring		X	X	X	X
Blood pressure automated		X	X	X	X
Blood pressure – manual	X	X	X	X	X
Eye irrigation	X	X	X	X	X
Eye irrigation – Morgan® lens				X	X
Thrombolytic therapy – initiation				X	X
Thrombolytic therapy – monitoring				X	X
Urinary catheterization				X	X
Venous blood sampling			X	X	X
Blood chemistry analysis		X	X	X	X

APPENDIX A: Medication Administration

1) EMT Basic
   - Aspirin may be administered by Standing Orders*
   - Oral Glucose may be administered by Standing Orders*
   - Anaphylaxis Epi KIts may be administered by Standing Orders for anaphylaxis only*
   - Beta-Agonist may be administered by standing order, single treatment only, multiple treatments require online medical control. **
   - Nitroglycerin (sublingual) may be administered with online medical control only**
   - Ibuprophen may be administered by Standing Orders*
   - Acetaminophen may be administered by Standing Orders *
   - Naloxone (nasal or auto-injector) may be administered by Standing Orders*

2) Intermediate EMT
   - All medications as stated under EMT Basic
   - Dextrose 50% may be administered by Standing Orders*

   With the transition from Intermediate 85 to Advanced EMT, it is understood that personnel may not exceed their existing skill set. Though this outline does not outline Intermediate skills, certified I 85's should refer to their applicable skills as taught in class and as defined in local protocol.

3) Advanced EMT
   - All drugs as stated under EMT Basic
   - Dextrose solutions may be administered by Standing Orders*
   - Nitrous Oxide may be administered by Standing Orders*
   - Naloxone (any route) may be administered by Standing Orders*
   - Nebulized Beta-Agonist, Nitrous Oxide, and Glucagon may be administered by Standing Orders*
   - May assist in the administration of non-controlled medications with onsite, direct supervision of a Paramedic.

4) Paramedic
   - All drugs as approved in the SC Prehospital Drug Formulary

*Agency must have protocols indicating approval and maintain record of local training and medical control endorsement. Protocols shall dictate indications, dosages, and routes as approved by Local Medical Control Physician.

** Online medical control ONLY

*** Paramedics that are not Critical Care credentialed may transport an interfacility patient while on a balloon pump with a MINIMUM of four hours of documented training on balloon pumps.

This approved skills list is to be used a reference only. Pursuant to Regulation 61-7, Section 901(B) EMTs (EMT, EMTI, AEMT, or Paramedic) shall only engage in those practices for which they have been trained and are within the scope of their Department-issued certification. Students currently enrolled in a Department-approved EMT, AEMT, or Paramedic program under the supervision of an appropriately credentialed preceptor may practice advanced skills for which they have been authorized in their respective training program.

It is a Class One violation to deviate from this approved skills list and may be punishable up to and including revocation of the individuals EMT credential.

Reviewed
Chief, Bureau of EMS

Approved
State Medical Control Physician