Tab 900
Medical Emergency Protocols

Lucas County Emergency Medical Services
2144 Monroe Street
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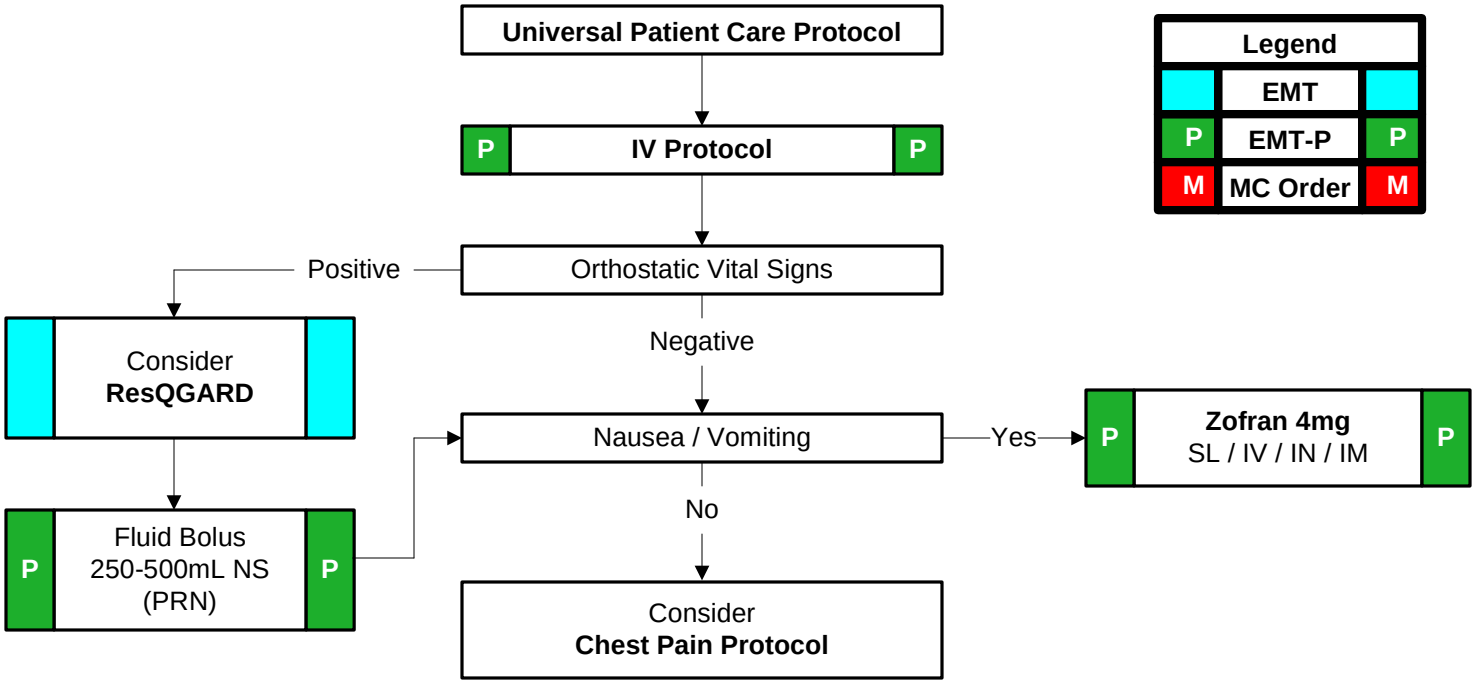
TAB 900
MEDICAL EMERGENCY PROTOCOLS
TABLE OF CONTENTS

SECTION

TAB 900
MEDICAL EMERGENCY PROTOCOLS
TABLE OF CONTENTS

A
Abdominal Pain

History:	Signs / Symptoms:	Differential:
• 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 • Menstrual history (pregnancy)	• 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	• 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)



A
Abdominal Pain

Special Considerations:

1. The differential (causes) of abdominal pain is numerous, with origin rarely identified in a field setting. Assessment should be centered upon gathering as much information as possible related to the complaint of “abdominal pain.”

2. Pain medication is seldom indicated and may change details of the physical exam necessary for physician diagnosis. Any administered pain medication for abdominal complaints must be authorized by ***On-Line Medical Control***.

3. Consider internal hemorrhage with an associated shock presentation. For blood pressure < 90mmHg, consider initial fluid bolus of 250-500mL NS (repeat PRN for perfusing BP). Elderly patients may have significant hypovolemic shock with blood pressures above 90mmHg.

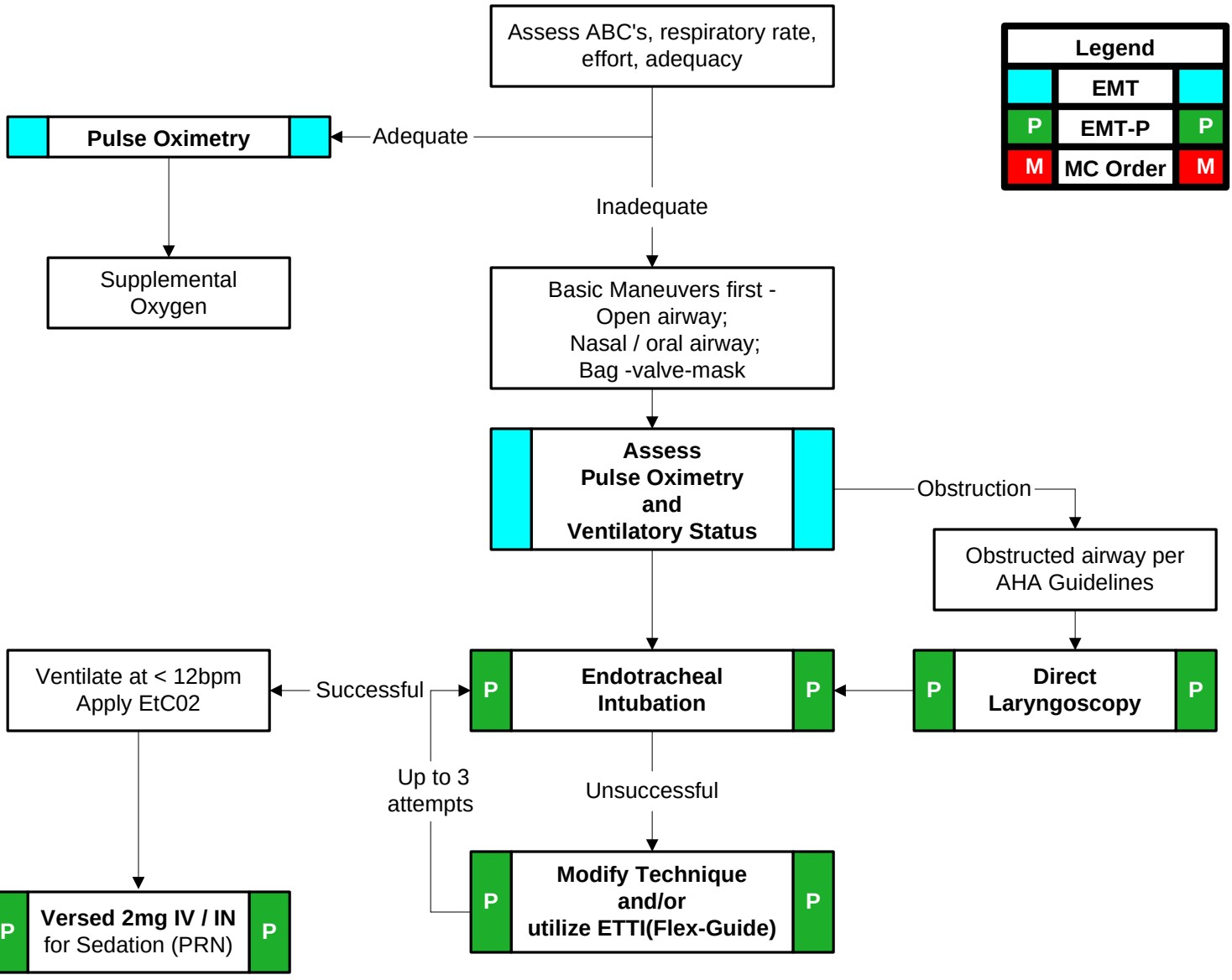
4. Abdominal pain in women of childbearing age should be treated as an ectopic pregnancy until proven otherwise.

5. The diagnosis of abdominal aneurysm should be considered with abdominal pain in patients over 50.

6. Appendicitis presents with vague, peri-umbilical pain which migrates to the RLQ over time.

7. For severe nausea and/or vomiting administer Zofran 4mg SL / IV / IN / IM. Zofran may be repeated x 1 in 5-10 minutes PRN.

B
Airway, Adult



B
Airway, Adult

Special Considerations:

1. For this protocol, the adult patient is defined as ≥ 16 years of age.

2. EDD (Tube Chek), capnometry/capnography is mandatory with all methods of intubation. Tube Chek should not be used on patients < 20kg (44lbs).

3. Limit intubation attempts to 3 per patient. A single attempt is defined as introduction of the laryngoscope blade into the patient's mouth regardless of attempt to pass ET tube.

4. Maintain spinal motion restriction (SMR) for patients with suspected head/spinal injury.

5. Sellick's maneuver or the BURP maneuver may be used to assist with difficult intubations.

6. Consider the use of the Flex Guide Endotracheal Tube Introducer (gum-elastic bougie) to facilitate endotracheal intubation on difficult airways.

7. Paramedics should consider using a KING Airway when they are unable to intubate a patient.

8. Continuous EtC02 and pulse oximetry monitoring is required on all intubated patients.

9. Consider C-collar/CID to maintain ETT placement for all intubated patients.

10. Surgical cricothyrotomy ***is only to be considered*** for a complete airway obstruction with no other means for patient ventilation.

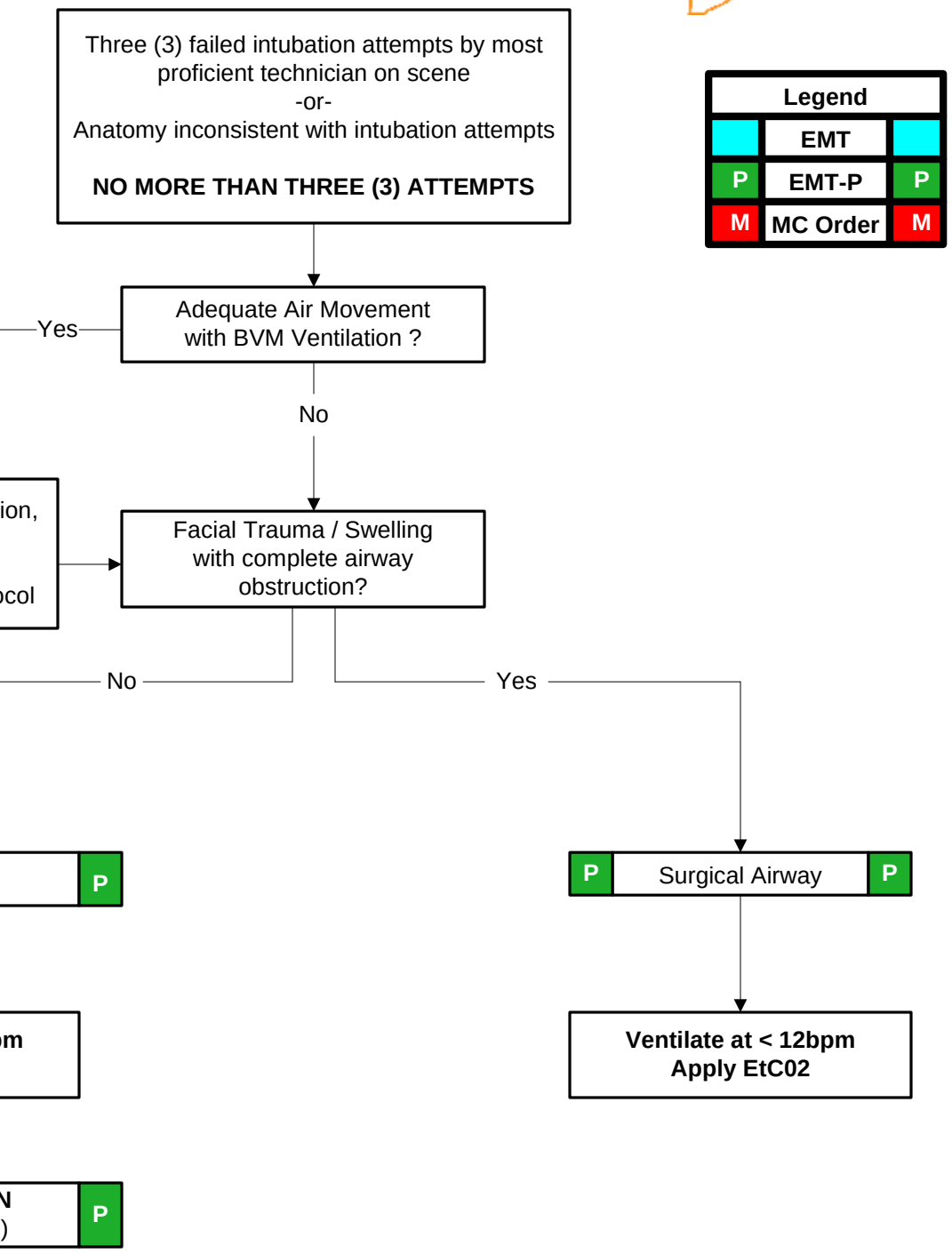
Special Considerations (cont.),

11. For combative patients following intubation, and a concern for loss of advanced airway, **administer Versed 2mg slow IV for sedation. Absent IV access, consider Versed 2mg IN. Maintain a blood pressure > 100mmHg. Versed 2mg may be repeated x 1 for desired sedative effect.** Additional Versed dosing must be authorized by ***On-Line Medical Control.***

    NOTE: The following guidelines must be followed for Versed administration following advanced airway placement:

    a. **Advanced airway: ETT, KING**
    b. **Frequent assessment of advanced airway confirming proper placement:**
        - **Direct visualization (if required)**
        - **Tube depth**
        - **Lack of epigastric sounds**
        - **Breath sounds for proper tube placement**
        - **Chest expansion**
        - **Bag-Valve compliance**
        - **End-Tidal C02 values**
        - **Patient status (sedation vs. tube removal)**
        - **Tube secured adequately**
        - **Patient secured (C-Collar/CID when appropriate)**
    c. **Continuous pulse oximetry monitoring**
    d. **Continuous end-tidal C02 monitoring (confirmed capnographic waveform)**
    e. **Frequent assessment of blood pressure. Maintain SBP > 100mmHg.**

C
Airway, Adult - Failed



C
Airway, Adult - Failed

Special Considerations:

1. For this protocol, the adult patient is defined as ≥ 16 years of age.

2. If first intubation attempt fails, make adjustments and try again:
   a. Different laryngoscope blade
   b. Different ETT size
   c. Change cricoid pressure
   d. Change head positioning
   e. Apply **BURP** maneuver (**B**ackward, **U**pward, **R**ight, **P**ressure): push trachea back [posterior], Up, and to the patient's right).

3. Continuous pulse oximetry should be utilized in all patients with inadequate respiratory function.

4. Notify ***On-Line Medical Control*** as early as possible concerning difficult / failed airway maneuvers.

5. Limit intubation attempts to 3 per patient. A single attempt is defined as introduction of the laryngoscope blade into the patient's mouth regardless of attempt to pass ET tube.

6. Maintain spinal motion restriction (SMR) for patients with suspected head/spinal injury.

7. Paramedics should consider using a KING airway when they are unable to intubate a patient.

8. Consider the use of the Flex Guide Endotracheal Tube Introducer (gum-elastic bougie) to facilitate endotracheal intubation on difficult airways.

9. Consider C-collar/CID to maintain ETT placement for all intubated patients.

10. Surgical cricothyrotomy ***is only to be considered*** for a complete airway obstruction with no other means for patient ventilation.

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        - **Patient status (sedation vs. tube removal)**
        - **Tube secured adequately**
        - **Patient secured (C-Collar/CID when appropriate)**
    c. **Continuous pulse oximetry monitoring**
    d. **Continuous end-tidal C02 monitoring (confirmed capnographic waveform)**
    e. **Frequent assessment of blood pressure. Maintain SBP > 100mmHg.**

D
Allergic Reaction

History:	Signs / Symptoms:	Differential:
• 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	• Itching or hives • Coughing / wheezing or respiratory distress • Chest or throat constriction • Difficulty swallowing • Hypotension or shock • Edema	• Urticaria (rash only) • Anaphylaxis (systemic effect) • Shock (vascular effect) • Angioedema (drug induced) • Aspiration / Airway obstruction • Vasovagal event • Asthma or COPD • CHF • Dystonia

Universal Patient Care Protocol

Hives / Rash Only
No Respiratory Component

IV / Cardiac Monitor

P **Benadryl** 25-50mg IV / IM P

Reassess Patient

Respiratory Distress
not in Arrest / Shock

IV / Cardiac Monitor

P **Epinephrine (1mg/mL)** 0.5mg IM P

P **Benadryl** 25-50mg IV / IM P

P **Solu Medrol** 125mg IV P

Impending
Respiratory Arrest / Shock

IV / Cardiac Monitor

P If evidence of Anaphylaxis **Epinephrine (0.1mg/mL)** 0.3mg IV P

Legend	
	EMT
P	EMT-P
M	MC Order

Special Consideration:

P **For Dystonic Reactions:** Consider Benadryl 25-50mg IV / IM P

Hypotension

Hypotension Protocol

Dysrhythmia

Appropriate Protocol

Respiratory Distress

Respiratory Distress Protocol

D
Allergic Reaction

Special Considerations:

1. Patients with allergic reactions can deteriorate quickly. The shorter the onset from symptoms to contact, the more severe the reaction. Maintenance of the patient's airway is of prime importance.

2. Any patient with respiratory symptoms or extensive reaction should receive IV or IM Benadryl.

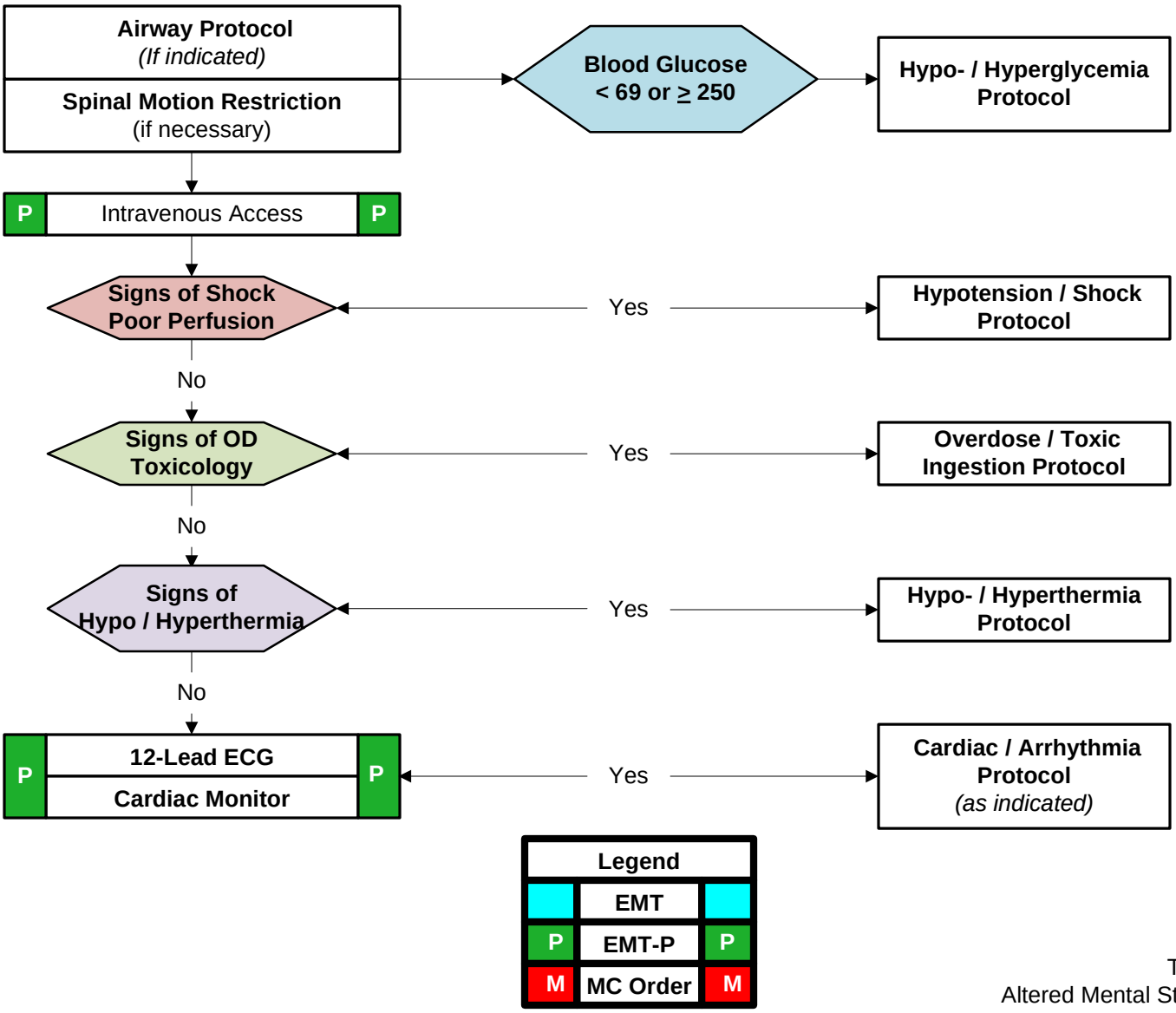
3. Type I allergic reactions (Anaphylaxis) may cause angioedema to the face and airway. Lethal edema may be localized to the tongue, uvula or other upper airway structures. Be prepared to intubate early before swelling causes a total occlusion of the airway.

4. Contact ***On-Line Medical Control*** prior to administering Epinephrine to 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.

5. ***Dystonic*** reactions are involuntary, unpleasant motor movements of the trunk, limbs or face following the administration of antipsychotic medications. Dystonic reactions are distressing to the patient, but rarely life threatening. Patients may have had similar symptoms previously. Acute dystonic reactions may be mistaken for anaphylaxis or seizures. Dystonic reactions may last several hours or days. Patient will present awake and conscious, with extrapyramidal symptoms, usually distraught or anxious. Extrapyramidal symptoms often consist of small spasmodic movements or tics of the arms, legs, face or neck muscles with lip smacking, grimacing, tongue protrusion, eye movements or neck twisting. Administer 25 – 50mg Benadryl IV / IM for resolve of dystonia-related extrapyramidal symptoms.

E
Altered Mental Status

History:	Signs / Symptoms:	Differential :
• Known diabetic, medic alert • Drugs, drug parapernalia • Report of illicit drug use • Toxic ingestion • Recent illness • Past medical history • Medications • History of trauma • Change in condition	• Decreased mental status • Change in baseline mental status • Bizarre behavior • Hypoglycemia (cool, diaphoretic skin) • Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)	• Head trauma • CNS (stroke, tumor, seizure, infection) • Cardiac (MI, CHF) • Infection • Thyroid (hyper / hypo) • Shock (septic, metabolic, traumatic) • Diabetes (hyper / hypoglycemia • Toxicologic • Acidosis / Alkalosis • Environmental exposure • Pulmonary (hypoxia) • Electrolyte abnormality • Psychiatric disorder



E
Altered Mental Status

Special Considerations:

1. There are many organic causes for altered mental states. Consider:

    a. Hypoxia
    b. Hypoglycemia
    c. Head Injury
    d. Hyperthermia
    e. Postictal states
    f. Drug overdose / Exposure
    g. Toxic exposure
    h. Hypothermia

2. Be aware of altered mental status as a presenting sign of an environmental toxin or Ha-Mat exposure and protect personal safety.

3. Pay careful attention to the head exam for signs of bruising or other injury.

4. Oral glucose should not be given to patients who cannot protect their own airway.

5. Thiamine 100mg IV should be considered prior to 50% Dextrose administration in patients with possible alcoholism or signs of malnutrition.

6. It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after therapy with IV Dextrose or IN / IM Glucagon.

7. Consider alcohol, prescription drugs, illicit drugs and Over the Counter preparations as a potential etiology.

8. For patients with altered mentation and combative / aggressive behavior, consider restraints for patient's and/or personnel's protection.

9. ***On-Line Medical Control*** contact is **required** for refusal of treatment and/or transport with appropriate signatures obtained on the ePCR.

10. The ***Airway Protocol*** should be considered for all patients unable to protect their own airway (i.e., semi-conscious, unconscious).

F
Behavioral / Agitated Delirium

History:	Signs / Symptoms:	Differential:
• Situational crisis • Psychiatric illness / medications • Injury to self or threats to others • Medic alert tag • Substance abuse / overdose • Diabetes	• Anxiety, agitation, confusion • Affect change, hallucinations • Delusional thoughts, bizarre behavior • Combative, violent • Expression of suicidal / homicidal thoughts	• See Altered Mental Status differential • Hypoxia • Alcohol intoxication • Medication effect / overdose • Withdrawal syndromes • Depression • Bipolar (manic-depressive) • Schizophrenia, anxiety disorders, etc.

Scene Safety

↓

Universal Patient Care Protocol

Legend	
	EMT
P	EMT-P
M	MC Order

Treat suspected medical or trauma problems per appropriate protocol
Altered Mental Status
Overdose
Head Trauma

Remove patient from stressful environment

↓

Verbal techniques
(reassurance, calm, establish rapport)

↓

Consider Restraints
(for patient / personnel safety)

↓

P — Consider **Ketamine** 4mg/Kg IM / IN (maximum of 400mg) — P

F
Behavioral / Agitated Delirium

Special Considerations:

1. Consider all possible medical/trauma causes for behavioral change (i.e., hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)

2. Do not overlook the possibility of associated domestic violence or abuse.

3. Psychiatric patients must be managed with concern. Don't succumb to the temptation to ignore new complaints which may be an indicator of acute change.

4. Maintain objectivity during evaluation and treatment. Verbal aggression exhibited by patients can quickly escalate to physical violence. Always proceed with calm, reassuring directions for the patient. If a situation appears threatening, sufficient law enforcement presence may be necessary before patient restraint is attempted.

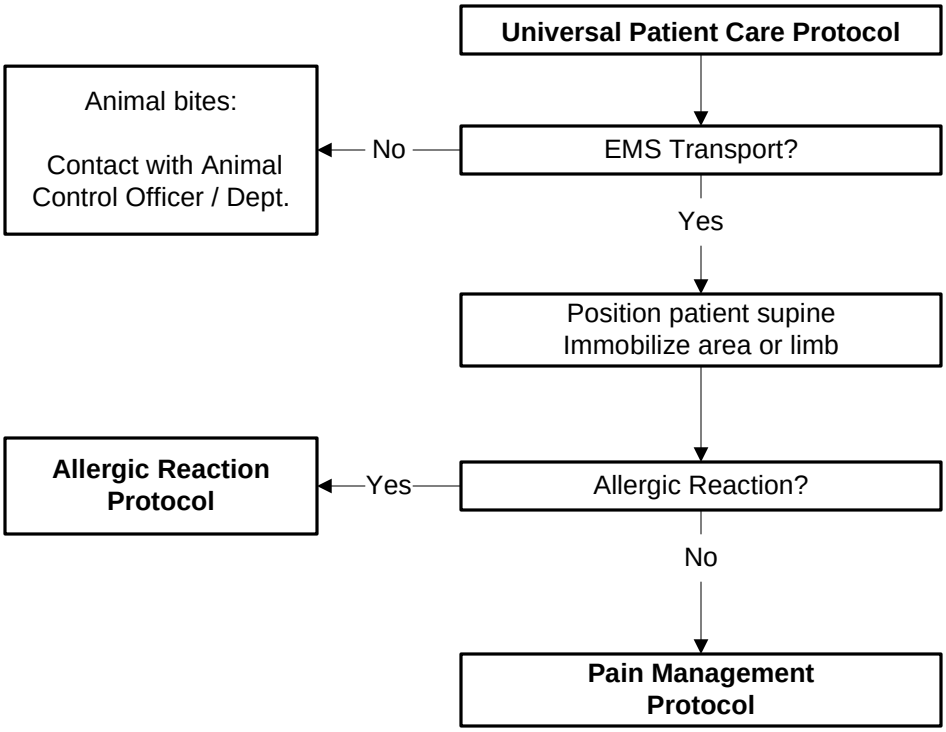
5. Consider your own safety and limitations when physical restraint is required. Engage law enforcement to assist with physical restraint when necessary.

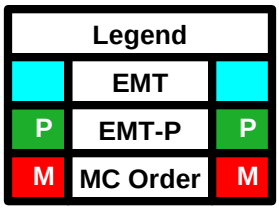
6. Restrained patients should never be left unattended. Continue to evaluate effectiveness of restraints and any compromise that may be caused by the restraint process (i.e., airway, breathing, circulation).

7. In rare circumstances it may be necessary to chemically restrain a patient with a history of acute psychosis and the presentation of Agitated Delirium. ***Administer Ketamine 4mg/Kg IM or IN (Maximum dosage 400mg).*** Consider titrating dose in intervals due to volume and regard for site (IN or IM) used to administer medication.

G
Bites and Envenomations

History:	Signs / Symptoms:	Differential:
• Type of bite / sting • Description / photo with patient identification of animal involved • Time, location, size of bite / sting • Previous reaction to bite / sting • Domestic vs. Wild • Tetanus and Rabies risk • Immunocompromised patient	• 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	• Animal bite • Human bite • Snake bite (poisonous) • Spider bite (poisonous) • Insect sting / bite (bee, wasp, ant, tick) • Infection risk • Rabies risk • Tetanus risk





G
Bites and Envenomations

Special Considerations:

1. Human bites are much worse than animal bites due to normal mouth bacteria.

2. Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.

3. Cat bites may progress to infection rapidly due to specific bacteria (Pasteurella multicoda).

4. Poisonous snake bites in this area are a rare occurrence.
    a. Amount of envenomation is variable, generally worse with larger snakes and early in spring.
    b. If no pain or swelling, envenomation is unlikely.
    c. It is not necessary to take the snake to the ED with the patient.
    d. The Toledo Zoo may be a contact point through LCEMS dispatch for rare or exotic animal envenomations requiring treatment.

5. 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).

6. 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).

7. Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.

8. Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplant patients.

H
Burns

History:	Signs / Symptoms:	Differential:
• Type of exposure (heat, gas, chemical) • Inhalation injury • Time of injury • Past medical history • Medications • Other trauma • Loss of consciousness • Tetanus/Immunization status	• Burns, pain, swelling • Dizziness • Loss of consciousness • Hypotension / shock • Airway compromise / distress • Singed facial or nasal hair • Hoarseness / wheezing	• **Superficial** (1st degree) • **Partial thickness** (2nd degree) • **Full thickness** (3rd degree) • **Chemical** • **Thermal** • **Electrical** • **Radiation**

Universal Patient Care Protocol

Remove rings, bracelets, and other constricting items

Legend	
	EMT
P	EMT-P
M	MC Order

Thermal

If burn < 10% body surface area (using rule of nines)
Cool down the wound with Normal Saline

Cover burn with a **Dry** sterile sheet or dressing

P **IV Protocol - Bolus 20mL/Kg** P
Consider 2nd IV for burns > 30%

P Consider (if necessary) **Pain Management Protocol** P

Consider transport directly to Burn Center if No airway involvement

Chemical

Remove clothing or expose area
Brush off any visible dry chemicals or powder

Flush area with water or Normal Saline for 10-15 minutes

Eye Involvement ?
Continuous saline flush in affected eye(s)

H
Burns

Special Considerations:

1. Do not overlook the possibility of multiple system trauma.

2. Burn patients are prone to hypothermia. Never apply ice or cool burns that involve > 10% body surface area.

3. Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.

4. Consider potential CO poisoning. Treat with 100% oxygen by mask.

5. Early intubation may be required with significant inhalation injuries.

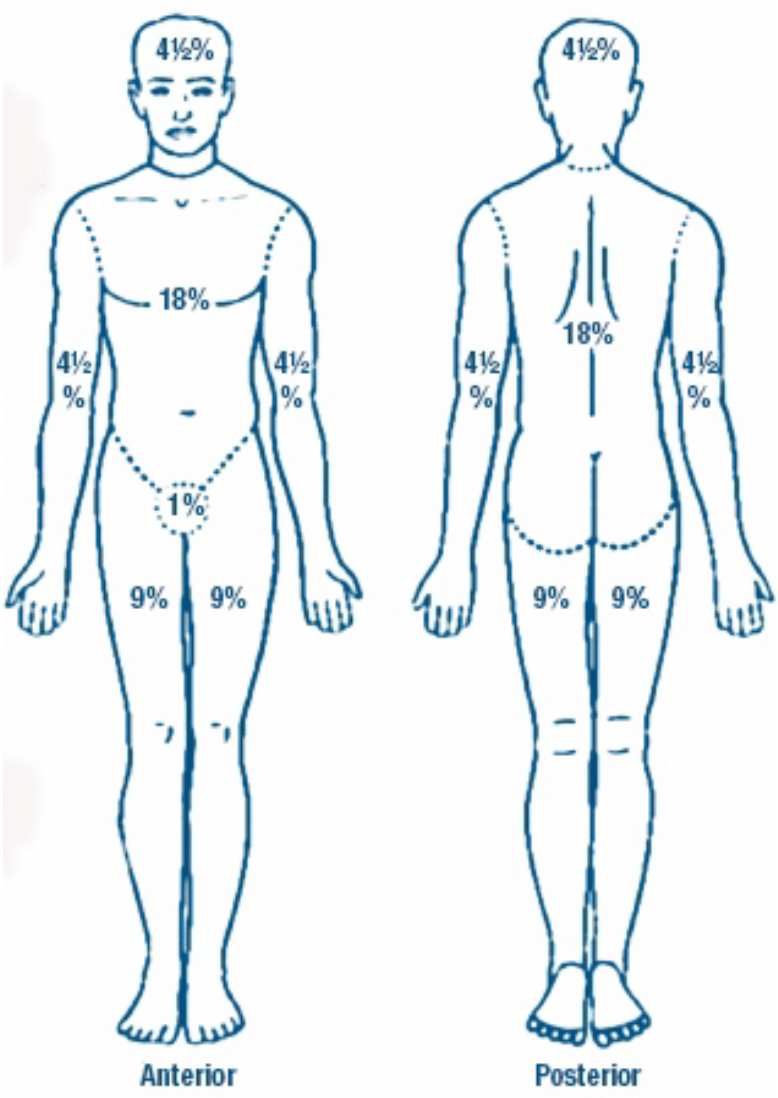
6. If airway involvement, consider transport to the closest hospital for optimal airway management.

7. **Critical Burns** (Transfer to recognized Burn Center):
    a. > 20% body surface area (BSA) age > 10.
    b. > 10% BSA age < 10.
    c. 3rd degree burns > 5% BSA
    d. 2nd and 3rd degree burns to face, eyes, hands or feet.
    e. Electrical burns
    f. Respiratory burns
    g. Deep chemical burns
    h. Burns with extremes of age or chronic disease
    i. Burns associated with major traumatic injury.

8. For moderate to severe discomfort/pain, consider administration of parenteral analgesics as outlined in **Tab 900 Section T: Pain Management.**

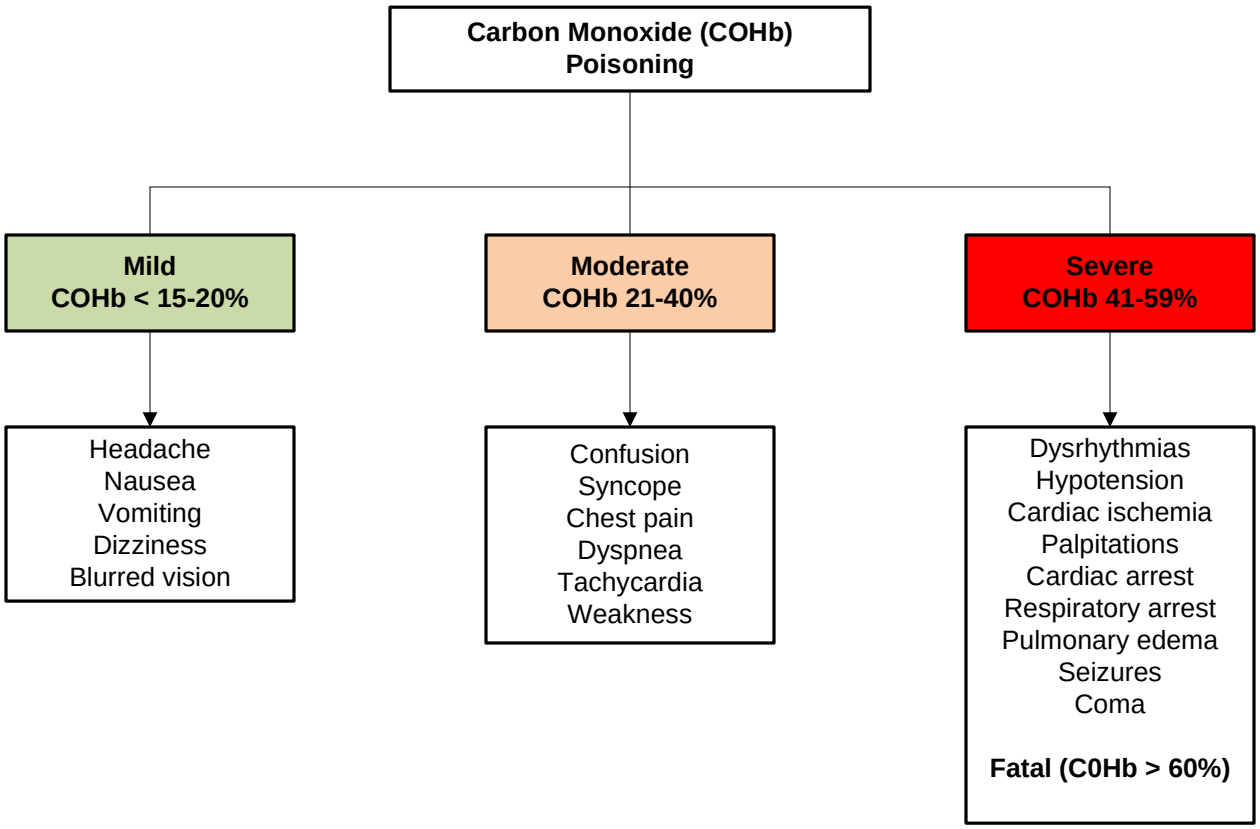
Special Considerations (cont.),

“Rule of Nines” (Adult Scale)



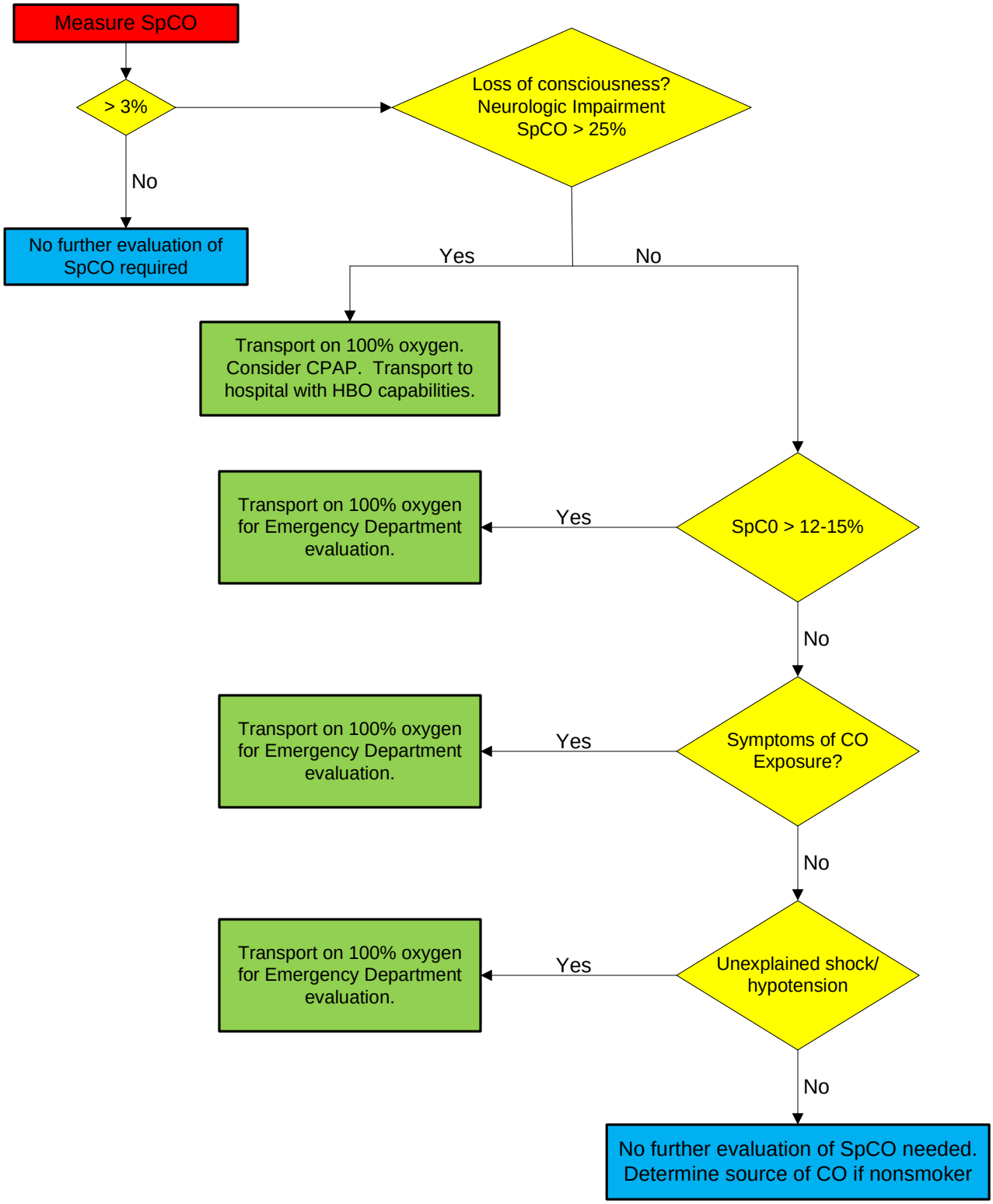
I
Carbon Monoxide Poisoning / Monitoring

History:	Signs / Symptoms (CO Exposure):	Differential:
• CO exposure incidents • Structure fires • Rehab incidents	• Flu-like illness • Fatigue • Chest pain • Lethargy • Depression • Nausea • Vomiting • Headaches • Abdominal pain • Drowsiness • Coma	• Influenza • Gastroenteritis • Alcohol intoxication • Drug overdose • Migraine headache • CVA • Hypoxia • Trauma • Depression • Fire / Rehab incidents



I
Carbon Monoxide Poisoning / Monitoring

Carbon Monoxide Triage Algorithm



I
Carbon Monoxide Poisoning / Monitoring

Carbon monoxide poisoning is the most common exposure poisoning in the United States and the rest of the world. It is an odorless, colorless gas that can cause sudden illness and death. As it is found in fumes from combustion, CO is produced from a variety of sources such as vehicles, gasoline engines, camp stoves, lanterns, burning charcoal and wood, gas ranges, heating systems and poorly vented chimneys. Structural fires are another common source of CO exposure for both victims and firefighters.

Carbon monoxide displaces oxygen from hemoglobin. Hemoglobin has an affinity for carbon monoxide that is 200-250 times that of oxygen. Only high concentrations of oxygen can displace carbon monoxide from hemoglobin.

Carbon monoxide poisoning is often called "the great imitator" and carboxyhemoglobin levels do not always correlate with symptoms nor predict sequelae.

Normal Carbon Monoxide Levels (ages 3 – 74):

- Nonsmokers = 0.83 $\pm$ 0.67%
- Smokers = 4.30 $\pm$ 2.55%
- All persons combined = 1.94 $\pm$ 2.24%

Special Considerations:

1. Carbon monoxide poisoning symptoms are non-specific and easy to miss and can lead to death and disability.

2. Poisoning is a particular occupational risk for firefighters.

3. Treatment is generally indicated with SpCO > 12-15%.

4. High-concentration oxygen should be administered to displace carbon monoxide from hemoglobin.

5. Be prepared to treat complications (e.g., seizures, cardiac ischemia).

6. Red skin color is usually a late finding and is an unreliable finding.

7. Efficacy of hyperbaric oxygen therapy is generally reserved for severe poisonings and may aid with tissue hypoxia:
    a. ***Consider transport to Toledo Hospital for hyperbaric chamber. Consult with On-Line Medical Control for diversion approval.***

Carbon Monoxide Poisoning / Monitoring

Special Considerations, (cont.)

Factors which may reduce the reliability of carbon monoxide readings:

- Poor peripheral circulation (hypovolemia, hypotension, hypothermia).
- Excessive sensor motion
- Fingernail polish (may be removed with finger nail polish remover).
- Irregular heart rhythms (atrial fibrillation, SVT, etc.)
- Jaundice

I
Carbon Monoxide Poisoning / Monitoring

Pulse CO-Oximeter Utilization in the Emergency Scene Rehab Area

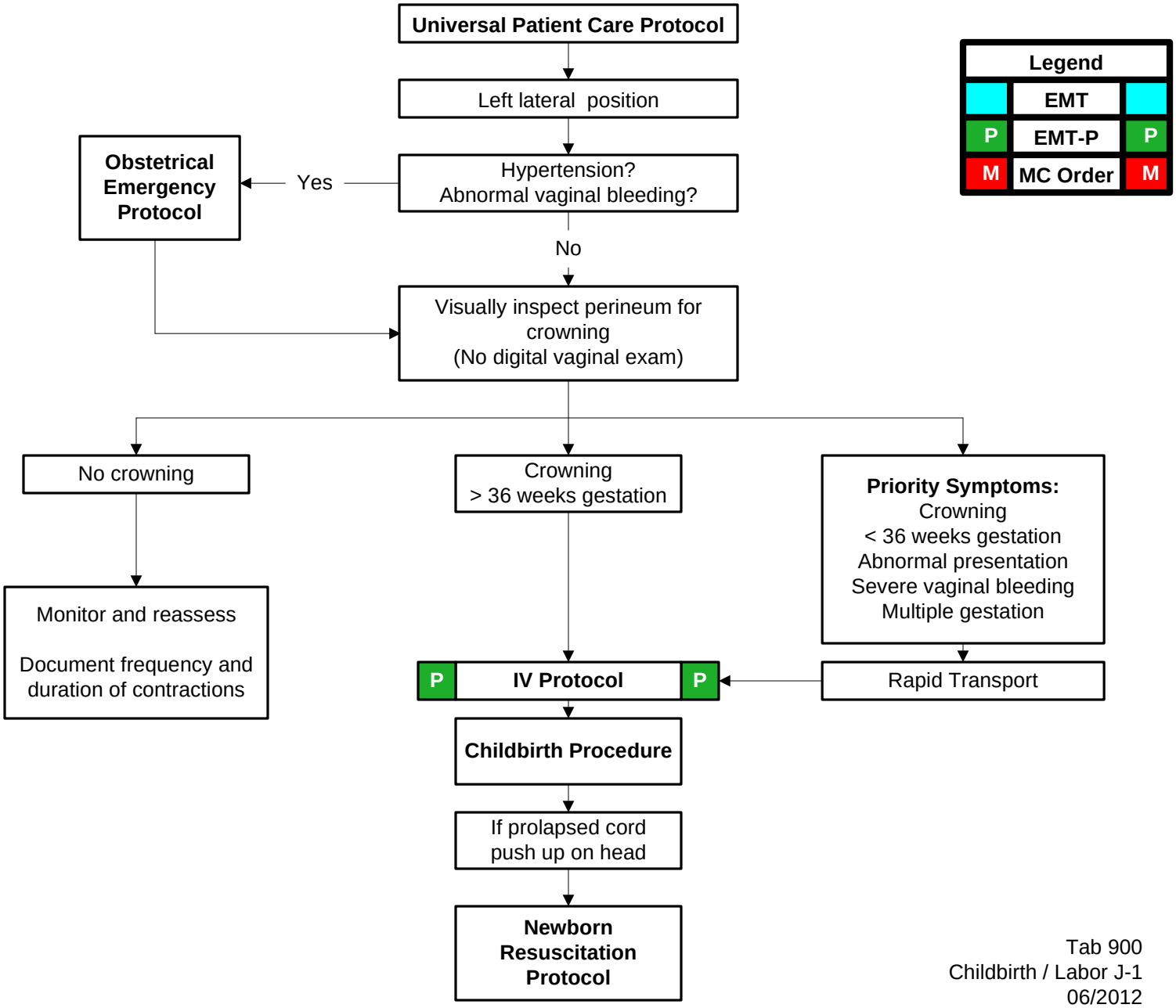
Emergency scene operations are dangerous for rescue personnel, and every opportunity to improve safety of the working emergency provider should be utilized. CO-oximetry will significantly improve the ability to assess the wellbeing of emergency workers, by instantly detecting elevated levels of carbon monoxide.

The following guidelines for pulse CO-oximeter utilization in the emergency scene rehab area is for reference only and does not supersede any fire department protocols or standing orders. Always follow protocols and procedures as authorized by your department.

- Values for carbon monoxide oximeter readings will normally be below 5% in non-smokers, and below 8% in smokers.
- On arrival in the rehab area, a reading should be obtained and recorded. Any symptoms should be recorded.
- A detector reading more than 12% indicates moderate carbon monoxide inhalation, and a reading of more than 25% indicates severe inhalation of carbon monoxide.
- Emergency workers with a CO level of more than 8% but below 15% must be given the opportunity to breathe ambient air for 5 minutes, and the result repeated. If still above 8%, they should be given oxygen via mask until the value drops below 5%.
- Workers showing any value of more than 15% need to be given oxygen via mask until the value drops below 5%.
- Any value of more than 25% must be completely evaluated and removed to a hospital, preferentially one which has a hyperbaric oxygen chamber.
- No emergency responder should leave the rehab area until the CO level on the monitor is below 5%. This is intended to improve scene safety and reduce injuries to rescue personnel, by ensuring that working personnel are not impaired by carbon monoxide toxicity.

J
Childbirth / Labor

History:	Signs / Symptoms:	Differential:
• 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 • Drug use • Gravida / Para status • High risk pregnancy	• Spasmodic pain • Vaginal discharge or bleeding • Crowning or urge to push • Meconium	• Abnormal presentation Buttock Foot Hand • Prolapsed cord • Placenta Previa • Abruptio Placenta



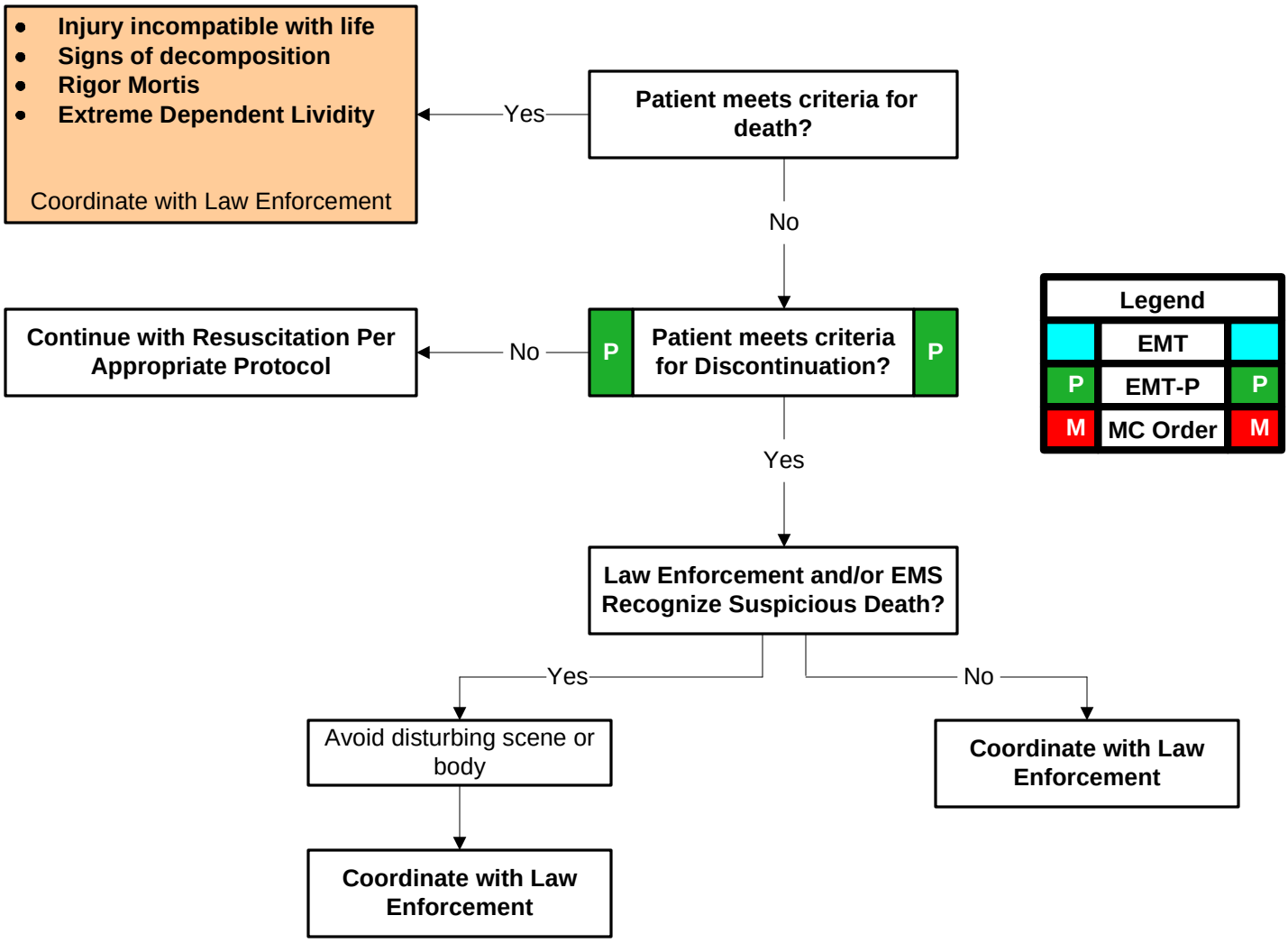
J
Childbirth / Labor

Special Considerations:

1. Document all times (delivery, contraction frequency, and length).
2. If maternal seizures occur, refer to the ***Obstetrical Emergencies Protocol (Tab 900, Section N).***
3. After delivery, massaging the uterus will promote uterine contraction and help to control post-partum bleeding.
4. Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
5. Record APGAR at 1 minute and 5 minutes after birth.

K
Deceased Persons (D.O.A.)

History:	Signs / Symptoms:	Differential:
• Patient encountered by EMS who meet criteria for obvious death • Patient with DNR order in place who is pulseless and apneic • Patient for whom resuscitation efforts are ceased on-scene	• Known medical conditions • Last time known to be alive	• Death of apparent medical causes • Suspicious death (law enforcement)



K
Deceased Persons
D.O.A

Special Considerations:

1. When a deceased person is encountered, emergency personnel should avoid disturbing the scene or the body as much as possible, unless it is necessary to do so to care for and assist other victims.

2. Once death has been determined, paramedics should transfer responsibility of scene management to a police agency, fire department and/or the coroner's office.

3. The paramedic and/or first responder should not leave the scene until responsibility for management of the scene has been transferred to an appropriate agency.

4. Patient criteria for obvious death:
    a. **There is injury which is incompatible with life** (e.g., decapitation, hemicorporectomy, burns beyond body recognition).
    b. **The victim shows signs of decomposition.**
    c. **The victim shows signs of rigor mortis** (Note: All 4 extremities should be physically assessed for stiffness related to rigor mortis).
    d. **Extreme dependent lividity** (Physically roll patient to evaluate dependent body areas for signs of blood pooling).

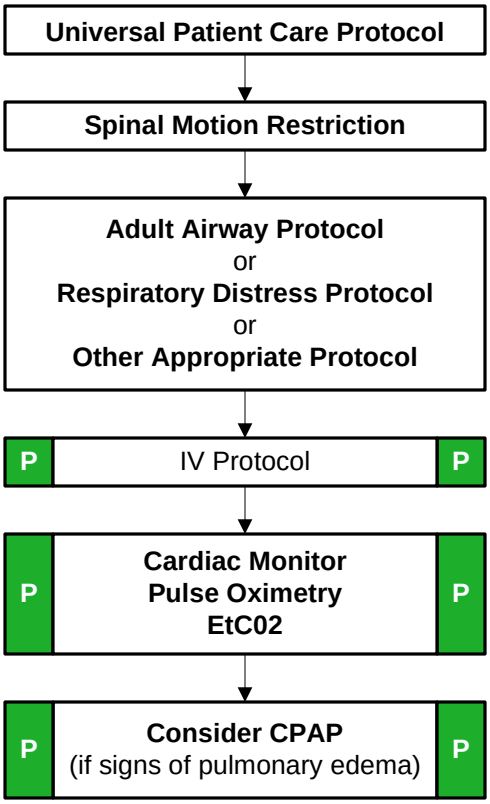
5. ***Criteria for obvious death must be documented in the patient care record (ePCR).***

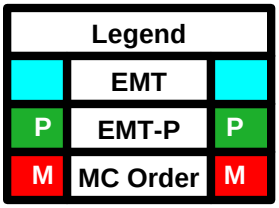
6. Death cannot be adequately determined in the hypothermic patient who may be asystolic, apneic, stiff and cold to the touch. Follow the guidelines for **Hypothermic Cardiac Arrest (Tab 800, Section H).**

7. If any doubt exists that the patient is dead at the time of arrival of the life squad, resuscitative measures should be instituted immediately and continued until:
    a. Appropriate DNR is verified
    b. Arrival at the hospital
    c. ***On-Line Medical Control*** authorizes discontinuation of prehospital resuscitation as outlined ***in LCEMS protocol Tab 800, Section G.***
    d. Physician has pronounced the patient dead.

L
Drowning / Submersion-Immersion

History:	Signs / Symptoms:	Differential:
• Submersion/immersion in water regardless of depth • Possible history of trauma (i.e., diving board) • Duration of submersion/immersion • Temperature of water • Fresh / Salt water	• Unresponsive • Mental status changes • Decreased or absent vital signs • Vomiting • Coughing	• Trauma • Pre-existing medical problem • Pressure injury (diving) • Barotrauma • Decompression sickness





L
Drowning / Submersion-Immersion

Special Considerations:

1. All victims of submersion/immersion injury should be transported for evaluation due to the potential for worsening over the next several hours.

2. Allow appropriately trained and certified rescuers to remove victims from areas of danger. Drowning is the leading cause of death among would-be rescuers.

3. Consider spinal motion restriction on all drowning victims. C-spine injury many times goes unrecognized.

4. Consider CPAP application for submersion/immersion victims that present with pulmonary edema. Patients must be awake, responsive and able to manage their own airway. Set initial pressure valve setting at 5cm H_20.

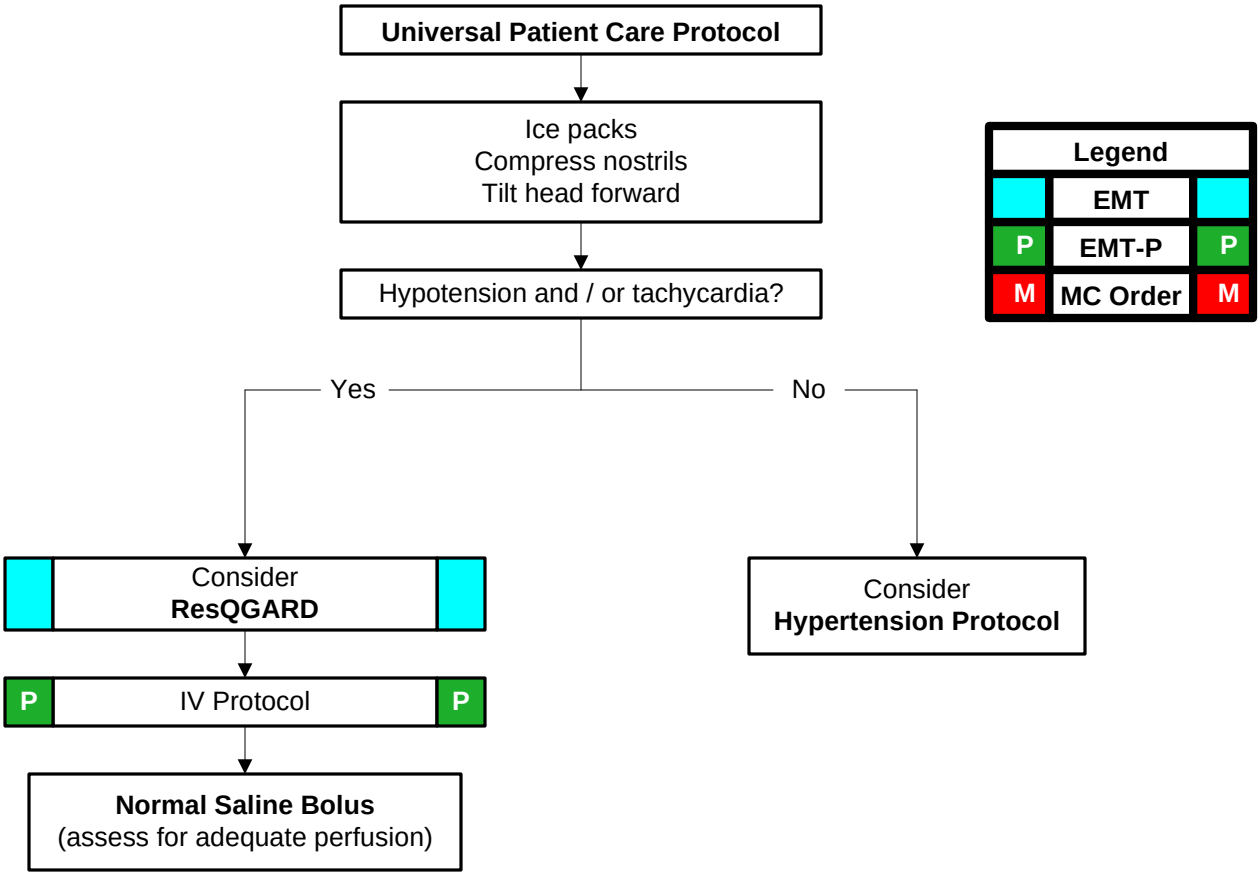
5. Consider temperature monitoring for cold water exposures.

6. Aggressively resuscitate cold-water drowning victims. Remember – with cold water there is no time limit.

7. With pressure injuries (decompression / barotraumas), consider transport or availability of a hyperbaric chamber.

M
Epistaxis

History:	Signs / Symptoms:	Differential:
• Age • Past medical history • Medications (HTN, anticoagulants) • Previous episodes of epistaxis • Trauma • Duration of bleeding • Quantity of bleeding	• Bleeding from nasal passage • Pain • Nausea • Vomiting	• Trauma • Infection (viral URI or Sinusitis) • Allergic rhinitis • Lesions (polyps, ulcers) • Hypertension



M
Epistaxis

Special Considerations:

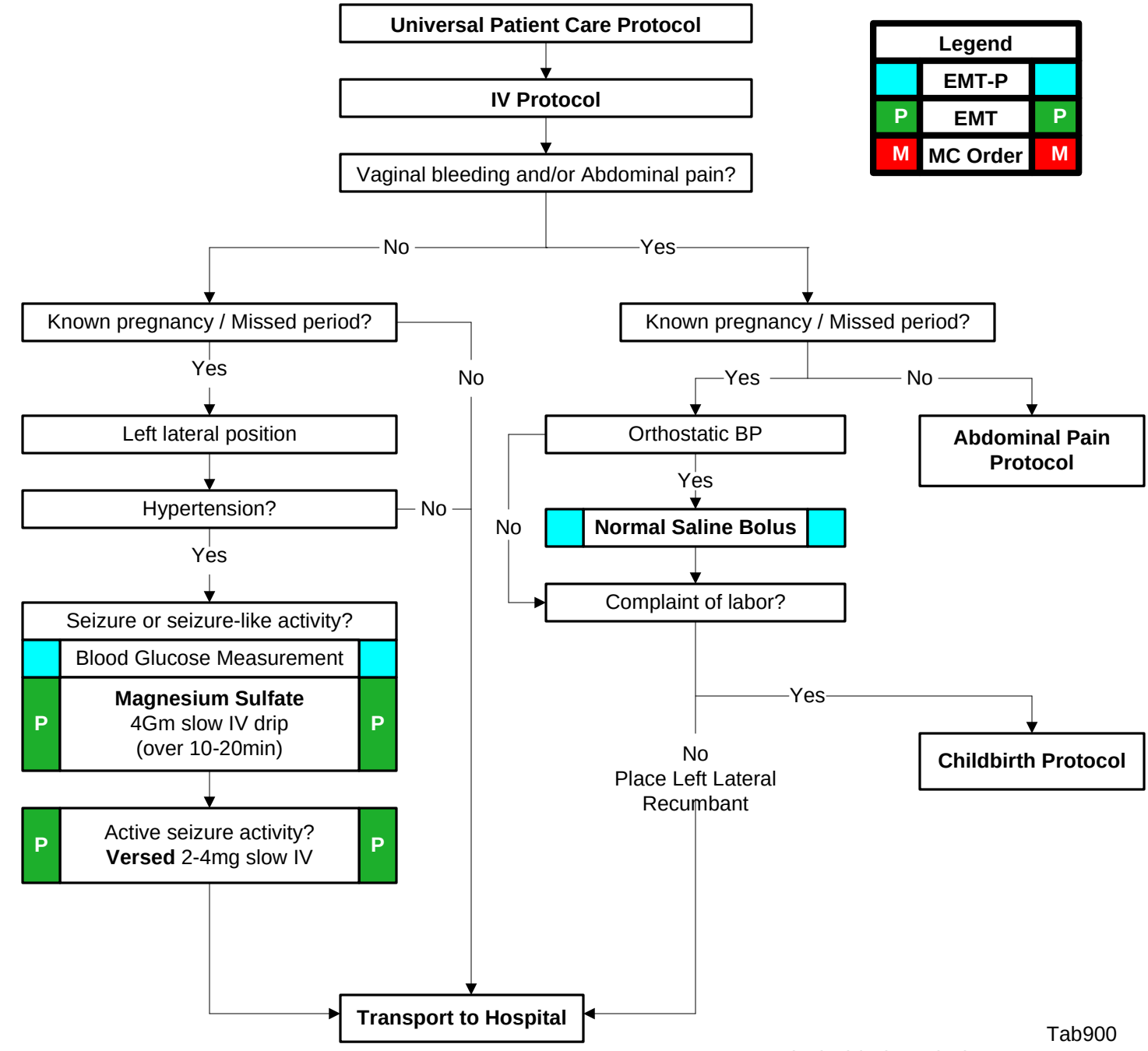
1. It is very difficult to quantify amount of blood loss with epistaxis

2. Bleeding may be occurring posteriorly.

3. Patients may be on anticoagulant therapy which will complicate bleeding control. Common anticoagulants include:
    a. Aspirin
    b. Coumadin
    c. Non-steroidal anti-inflammatory medications (Ibuprofen)
    d. Many OTC headache relief powders

N
Gynecological / Obstetrical Emergency

History:	Signs / Symptoms:	Differential:
• Past medical history • Hypertension medications • Prenatal care • Prior pregnancies / births • Gravida / Para	• Vaginal bleeding • Abdominal pain • Seizures • Hypertension • Severe headache • Visual changes • Edema of hands and face	• Pre-eclampsia / Eclampsia • Placenta previa • Placenta abruptio • Spontaneous abortion



N
Gynecological / Obstetrical Emergency

Special Considerations:

1. The amount of vaginal bleeding may be difficult to estimate. Visual estimates from sheets and towels can be misleading. Ask the patient to quantify bleeding – number of saturated pads used in the last hour.

2. Always consider pregnancy as a cause of vaginal bleeding. Discreet inspection of the perineum may be helpful to determine if there has been passage of tissue or clots. When possible, collect any passed tissue or clots for hospital analysis.

3. Severe headache, vision changes, or RUQ pain may indicate preeclampsia. History may reflect pre-existing pregnancy-induced hypertension.

4. In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic. A relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure would also qualify as hypertension.

5. Maintain pregnant patients in a left lateral position to minimize risk of supine hypotension syndrome.

6. Any pregnant patient involved in a MVC should be transported for immediate evaluation and fetal monitoring.

7. For seizure or seizure-like activity associated with eclampsia administer 4Gm Magnesium Sulfate over 10-20 minutes. Magnesium Sulfate administration can be accomplished by mixing 4 Grams of Magnesium Sulfate in 50mL bag of D5W. With administration set to mini-drip (60gtts), run wide open. Medication will be delivered over 10-20 minutes.

Special Considerations (cont.),

8. For continued seizure activity after Magnesium Sulfate, administer Versed 2-4mg IV. If loss of IV access, administer Versed IN. Any additional dosing of Versed must be authorized by ***On-Line Medical Control.*** **NOTE: The following guidelines must be followed for Versed administration:**
    a. **Frequent assessment of airway for compromise requiring assistance.**
    b. **Continuous pulse oximetry monitoring**
    c. **If advance airway placed, continuous end-tidal C02 monitoring (confirmed capnographic waveform).**
    d. **Frequent assessment of blood pressure. Maintain SBP > 100mmHg.**

O
Hypertensive Emergency

History:	Signs / Symptoms:	Differential:
• Documented hypertension • Related diseases: diabetes, CVA, renal failure, cardiac • Medications (compliance?) • **Viagra, Levitra, Cialis** • Pregnancy	**One of these:** • Systolic BP 200 or greater • Diastolic BP 130 or greater **And at least one of these:** • Headache • Nosebleed • Blurred vision • Dizziness	• Hypertensive encephalopathy • Primary CNS injury (Cushing's response = bradycardia with hypertension • Myocardial infarction • Aortic dissection (aneurysm) • Pre-eclampsia / Eclampsia

Universal Patient Care Protocol

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Bilateral Blood Pressures

↓

Nitroglycerin SL
(Spray or tablet)
Repeat x 1 in 5 min. (PRN)

↓

IV Protocol

↓

P | **Captopril** 25mg tablet SL PRN | P

↓

P | 12-Lead ECG | P

Legend	
	EMT
P	EMT-P
M	MC Order

O
Hypertensive Emergency

Special Considerations:

1. The level of blood pressure alone does not determine a hypertensive emergency; rather, it is the degree of target organ involvement that will determine the rapidity with which blood pressure should be reduced to a safer level to prevent or limit target organ damage. ***Elevated blood pressure of itself rarely requires emergency therapy.*** Initial triage should quickly identify those patients who have an elevated BP without any evidence of significant target organ damage or any other impending cardiovascular events.

2. The physical examination should begin with an assessment of blood pressure using an appropriately sized cuff in both upper extremities. Radial, brachial, and carotid pulses should be assessed. A careful cardiovascular examination, as well as a thorough neurologic examination, including mental status, should be conducted.

3. The initial goal for BP reduction is not to obtain a normal BP, but to achieve a progressive controlled reduction to minimize the risk of hypoperfusion to vital organs. ***Initial reduction in mean arterial pressure should not exceed 20-25% below the pretreatment BP***. ***As an alternative, mean arterial pressure can be reduced within the first 30-60 minutes to 110–115mmHg.*** Excessively rapid reductions in BP have been associated with acute deterioration in renal function, ischemic cardiac or cerebral events, and occasional retinal artery occlusion and acute blindness.

   Example: BP – 240/130 = MAP of 167 (1/3 pulse pressure + Diastolic)
   (Treatment Goal: reduction of MAP to 110-115mmHg)

4. Signs and symptoms of a hypertensive emergency:
   a. Rapid rise in diastolic pressure over 130mmHg
   b. New onset symptoms that accompany rise in BP:
      i. Agitation
      ii. Severe headache
      iii. Dizziness
      iv. Nausea / vomiting
      v. Mental confusion
      vi. Visual impairment (may include transient blindness)
      vii. Difficulty breathing

O
Hypertensive Emergency

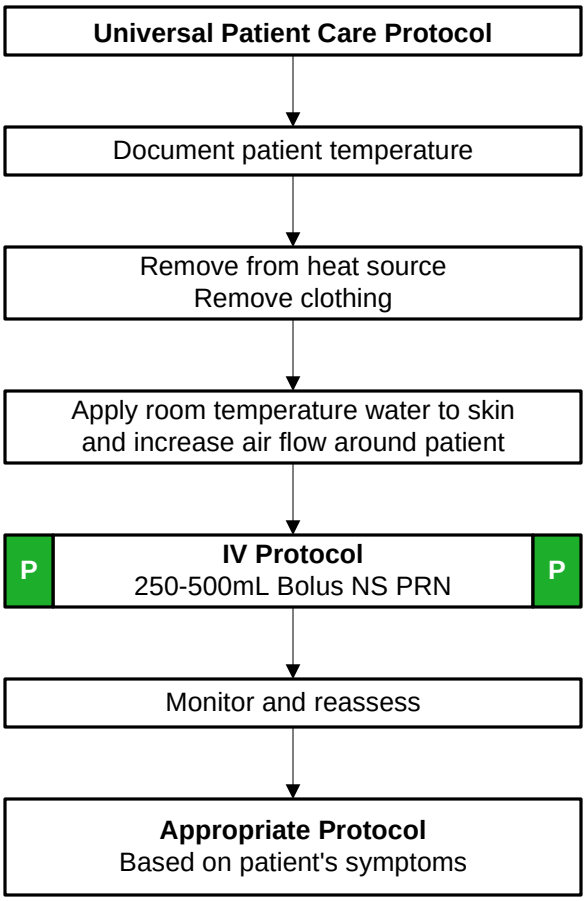
Special Considerations (cont.),

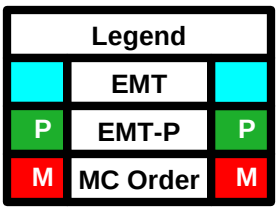
5. For symptomatic hypertensive emergencies, administer Nitroglycerin 0.4mg (tablet or spray). Repeat x 1 PRN for controlled reduction in blood pressure. ***Initial reduction in mean arterial pressure should not exceed 20-25% below the pretreatment BP***. ***Mean arterial pressure can be reduced within the first 30-60 minutes to 110–115mmHg.***

6. For continued symptoms and elevated BP, administer 25mg Captopril SL. Captopril will assist in reducing SVR, lowering blood pressure and cause vasodilation of the arterial system. **Captopril is administered sublingually. A 25 mg tablet can be wetted and placed under the tongue and will begin working within 15 minutes.** ***Initial reduction in mean arterial pressure should not exceed 20-25% below the pretreatment BP***. ***Mean arterial pressure can be reduced within the first 30-60 minutes to 110–115mmHg.***

P
Hyperthermia

History:	Signs / Symptoms:	Differential:
• Age • Exposure to increased temperatures and / or humidity • Past medical history • Extreme exertion • Time and length of exposure • Poor PO intake • Fatigue and / or muscle cramping	• Altered mental status or unconsciousness • Hot, dry or sweaty skin • Hypotension or shock • Seizures • Nausea	• Fever (Infection) • Dehydration • Medications • Hyperthyroidism (Storm) • Delirium tremens (DT's) • Heat cramps • Heat exhaustion • Heat stroke • CNS lesions or tumors





P
Hyperthermia

Special Considerations:

1. Extremes of age are more prone to heat emergencies (i.e., young and old). Predisposed by use of Tricyclic Antidepressants, Phenothiazines, Anticholinergic medications, and alcohol. Cocaine, Amphetamines, and Salicylates may elevate body temperature.

2. The body's "sweating" mechanism generally disappears as body temperature rises above 104°F (40°C). Intense shivering may occur as the patient is cooled.

3. Hyperthermia differential:
    a. **Heat Cramps** – consists of benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
    b. **Heat Exhaustion** – consists of dehydration, salt depletion, dizziness, fever, weakness, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
    c. **Heat Stroke** – consists of dehydration, tachycardia, hypotension, temperature > 104°F (40°C), and an altered mental status.

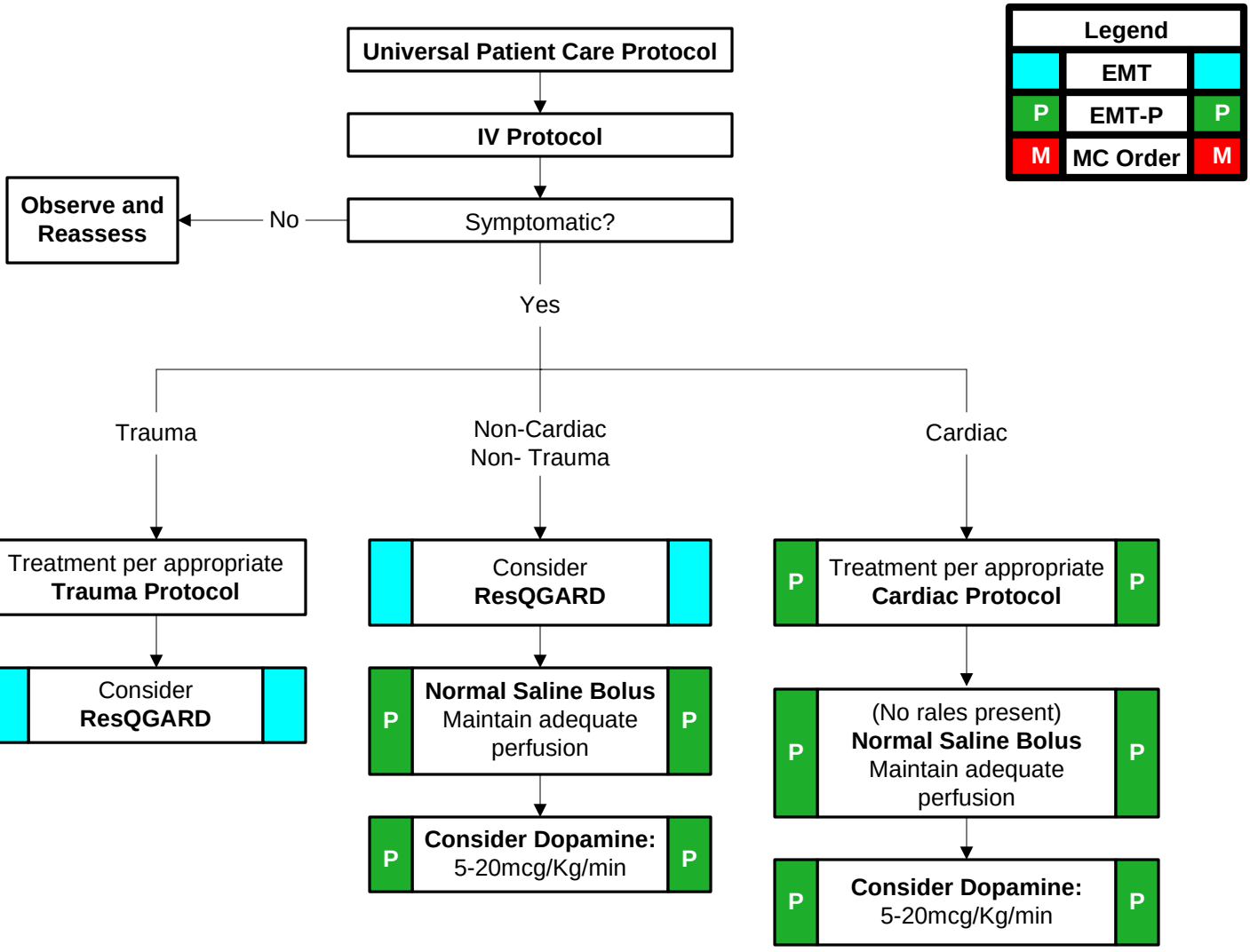
4. Initial cooling measures for heat exhaustion/stroke can be accomplished by applying cold packs (neck, axilla, and groin) or water-soaked sheets. Ensure adequate airflow over patient for evaporative loss. Do not let cooling measures in the field delay transport.

5. For signs of hypovolemia, initiate fluid bolus of normal saline to maintain adequate perfusion.

6. Seizure activity associated with hyperthermia should be treated according to the ***Seizure Protocol (Tab 900, Section V).***

Q
Hypotension
Shock (Non-Trauma)

History:	Signs / Symptoms:	Differential:
• Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic pregnancy • Fluid loss - vomiting, diarrhea, fever • Infection • Cardiac ischemia (MI, CHF) • Medications • Allergic reaction • Pregnancy • History of poor oral intake	• Restlessness, confusion • Weakness, dizziness • Weak, rapid pulse • Pale, cool, clammy skin • Delayed capillary refill • Hypotension • Coffee-ground emesis • Tarry stools	• Shock • Hypovolemia • Cardiogenic • Septic • Neurogenic • Anaphylactic • Ectopic pregnancy • Dysrhythmias • Pulmonary embolus • Tension pneumothorax • Medication effect / overdose • Vasovagal • Physiologic (pregnancy)



Q
Hypotension
Shock (Non-Trauma)

Special Considerations:

1. Hypotension can be defined as a systolic blood pressure < 90mmHg.

2. Consider all possible causes of shock and treat per appropriate protocol.

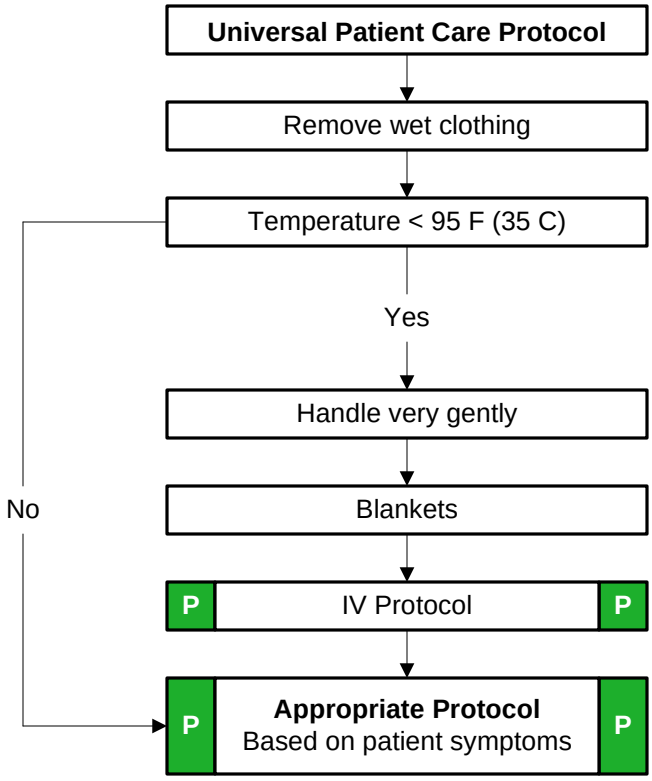
3. Consider performing orthostatic vital signs on patients in non-trauma situations if suspected blood or fluid loss.

4. Consider application of the ResQGARD for patients ≥ 25 lbs. who are experiencing symptoms of low blood circulation secondary to a variety of causes such as:
    a. Hypovolemia
        i. Internal hemorrhage
        ii. External hemorrhage
        iii. Dehydration
    b. Hypotension
        i. Dialysis
        ii. Sepsis
        iii. Orthostatic intolerance
        iv. Medication reaction

5. For signs of hypovolemia, initiate fluid bolus to maintain adequate perfusion.

R
Hypothermia

History:	Signs / Symptoms:	Differential:
• Past medical history • Medications • Exposure to environment even in normal temperatures • Exposure to extreme cold • Extremes of age • Drug use: Alcohol, barbiturates • Infections / Sepsis • Length of exposure / wetness	• Cold, clammy • Shivering • Mental status changes • Extremity pain or sensory abnormality • Bradycardia • Hypotension or shock	• Sepsis • Environmental exposure • Hypoglycemia • CNS dysfunction Stroke Head injury Spinal cord injury



Legend		
	EMT	
P	EMT-P	P
M	MC Order	M

R
Hypothermia

Special Considerations:

1. Hypothermia is defined as a core body temperature < 35°C (95°F).

2. The body “shivering” mechanism fails below 32°C (90°F). Severely hypothermic patients may no longer experience a feeling of cold and occasionally will even undress and appear vasodilated.

3. If the body temperature is unable to be measured, treat the patient based on the suspected temperature.

4. With temperatures less than 31°C (88°F) ventricular fibrillation is a common cause of death. Handling patient gently may prevent this.

5. Extremes of age are more susceptible to hypothermia (i.e., young and old).

6. Hypothermia may produce severe bradycardia.

7. Patients who appear dead after prolonged exposure to cold air or water should not be declared “dead” until they have been rewarmed. Full recovery from hypothermia with undetectable vital signs, severe bradycardia and even periods of cardiac arrest have been reported.

S
Overdose / Toxic Ingestion

History:	Signs / Symptoms:	Differential:
• Ingestion or suspected ingestion of a potentially toxic substance • Substance ingested, route, quantity • Time of ingestion • Reason (suicidal, accidental, criminal) • Available medication in home • Past medical history, medications	• Mental status changes • Hypotension / Hypertension • Decreased respiratory rate • Tachycardia, dysrhythmias • Seizures	• Tricyclic antidepressants (TCAs) • Acetaminophen (Tylenol) • Depressants • Stimulants • Anticholinergic • Cardiac medications • Solvents, alcohols, cleaning agents • Insecticides (organophosphates) • Cyanide Exposure / Poisoning

Universal Patient Care Protocol

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IV Protocol

↓

Differential

Legend	
	EMT
P	EMT-P
M	MC Order

- Altered Mentation / Respiratory Depression → P | **Narcan** 4mg IV / IM / IN | P
- Organophosphates / Carbamates → P | **Atropine** 2mg IV q 5 min, No maximum dose | P
- Tricyclic Ingestion → P | Cardiac Arrhythmia? **Sodium Bicarbonate** 1mEq/Kg IV / IO | P
- Beta Blocker → P | **Glucagon** 1mg IV / IN / IM | P
- Calcium Channel Blocker → P | **Calcium Chloride** 20mg/Kg slow IV / IO | P
- Cyanide Poisoning → P | **Cyanokit** 5Gm over 15 minutes | P
- Other → **Hypotension, Seizures, Ventricular dysrhythmias, or Mental status changes** → **Appropriate Protocol**

S
Overdose / Toxic Ingestion

Special Considerations:

1. Do not rely on patient history of ingestion, especially in suicide attempts.

2. All empty containers of ingested material should accompany patient to the hospital. All emesis should be saved for analysis.

3. For blood glucose values < 60mg/dl, administer Dextrose 50% IV. Thiamine 100mg IV should be considered prior to Dextrose administration in patients with possible alcoholism or signs of malnutrition.

4. Overdose / Ingestion concerns:
    a. **Tricyclic** – 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
    b. **Acetaminophen** – Initial presentation normal or nausea/vomiting. If not detected and treated, will cause irreversible liver failure.
    c. **Depressants** – decreased HR, decreased temperature, decreased respirations, non-specific pupils.
    d. **Stimulants** – increased HR increased BP, increased temperature, dilated pupils, seizures.
    e. **Anticholinergic** – increased HR, increased temperature, dilated pupils, mental status changes.
    f. **Cardiac Medications** – dysrhythmias and mental status changes.
    g. **Solvents** – nausea, vomiting, and mental status changes.
    h. **Insecticides** – increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.

5. For patients with altered mentation and combative / aggressive behavior, consider restraints for patient's and/or personnel's protection.

6. The ***Airway Protocol*** should be considered for all patients unable to protect their own airway (i.e., semi-conscious, unconscious).

T
Pain Management

History:	Signs / Symptoms:	Differential:
• Age • Location • Duration • Severity (1-10) • Past medical history • Medications • Drug allergies	• Severity (pain scale) • Quality (sharp, dull, etc.) • Radiation • Relation to movement, respiration • Increased with palpation of area	• Per specific protocol • Musculoskeletal • Visceral (abdominal) • Cardiac • Pleural / Respiratory • Neurogenic • Renal (colic)

	EMT	
P	EMT-P	P
M	MC Order	M

Enter from **Protocol** based on **Specific Complaint**

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

Mild Pain

P

Ibuprofen (Motrin / Advil) 10mg/Kg PO
Maximum 800mg

-Or-

Acetaminophen (Tylenol) 15mg/Kg PO
Maximum 1Gm

P

IV Protocol
If indicated

Monitor and Reassess

Moderate to Severe

P

IV / IO Procedure

Cardiac Monitor

Fentanyl 1mcg/Kg IV/IO/IM/IN
Max. initial dose 50mcg
Max. cumulative dose: 200mcg

-Or-
Morphine Sulfate 0.1mg/Kg IV/IO/IM
Max. initial dose 10mg
Max. cumulative dose: 20mg

P

M

-Or-
Ketamine 0.25mg/Kg IV/IO/IM/IN
Max. initial dose 25mg
Max. cumulative dose: 100mg

-Or-
Ketorolac (Toradol) – one time dose
15mg IV/IO or 30mg IM

-Or-
Dilaudid 1-2mg IM/IV/IO
Max. initial dose 2mg
Max. cumulative dose: 4mg

M

Monitor and Reassess every 5 minutes

Notify Destination or Contact Medical Control

T
Pain Management

The practice of prehospital emergency medicine requires expertise in a wide variety of pharmacological and non-pharmacological techniques to treat acute pain resulting from myriad injuries and illnesses. Approaches to pain relief must be designed to be safe and effective in the dynamic prehospital environment. The degree of pain and the hemodynamic status of the patient will determine the urgency and extent of analgesic interventions.

A discussion with the patient regarding realistic expectations for pain control is an element within the process of pain management that is frequently overlooked. Multiple factors that include, but are not limited to, type and severity of illness or injury, individual pain tolerance, extrication processes, and transport times are variables that may impact levels of pain as well as pain management. Dependent upon patient condition, scenario, and patient's pain tolerance, the goal of pain management may be pain control or reduction or discomfort rather than complete elimination of pain.

Objective measures or pain ratings improve pain management by:

- Balancing imprecise clinician pain assessment
- Tracking success of pain management

Pain Assessment:

- Numeric rating scale (1-10)
- Visual analog scale (pain level marked on a horizontal line)
- Verbal rating scale (none, mild, moderate, severe, unbearable)
- Wong-Baker FACES Scale (pediatrics)

A number of studies have shown that early administration of analgesics allow patients to relax, removes voluntary guarding and permits better assessment of localized tenderness.

Safe Use of Analgesics:

A. <u>Be aware of the effects of combining drugs</u>: Adding one CNS depressant or hemodynamic depressant to another can create unpredictable changes.

B. <u>Don't forget about medication allergies</u>: Adding IV analgesics on top of recently taken oral sedatives, analgesics or muscle relaxants may cause unpredictable additive effects as well.

C. <u>Know your pain management goal</u>: Your goal may actually be different for different types of patients (Reduction of pain vs. removal of pain).

Pain Management, continued

D. Reassess your patient frequently: Hemodynamic status and pain scale.

E. Give a complete report to ED staff: Drugs given, time, results, and adverse effects.

This guideline does not address pain management for the following patient presentations (for these patients, consultation with medical direction is recommended):

1. Pregnancy with active labor
2. Dental pain
3. Patients with care plans that prohibit the use of parenteral analgesics by EMS
4. Patients with chronic pain who are not enrolled in a hospice or palliative care plan

Pain Management PEARLS:

- Assess serial vital signs with emphasis on blood pressure, respiratory status and level of consciousness.
- **Parenteral analgesics administered in the field must be transported by a Lucas County EMS life squad or ALS service recognized by Lucas County EMS.**
- **Parenteral analgesic administration may preclude a patient's ability to refuse transport due to possible altered mentation.**

General Considerations:

A. Determine the patient's onset and level of pain. A self-reported numeric scale is usually applicable to the adult population; however, variable levels of pain tolerance makes this measurement subjective.

B. Utilize verbal reassurance to control anxiety.

C. If available, consider use of non-pharmaceutical pain management techniques:
   - Placement of the patient in a position of comfort
   - Application of ice packs and/or splints for pain secondary to trauma

Pain Management, continued

D. Apply a cardiac monitor if indicated based upon patient assessment.

E. If the patient is experiencing moderate discomfort or if patient positioning and/or the application of ice packs and/or splints provides inadequate pain control, consider the administration of analgesics.

F. If the patient is experiencing severe to excruciating pain or the treatment provided to control moderate pain is ineffective or clinically inadequate, consider the administration of parenteral analgesics.

G. For ACS-related chest pain unrelieved by nitroglycerin, and available, consider small incremental doses of Morphine Sulfate (2-5mg) for analgesia (primary). Otherwise, consider Fentanyl or other listed analgesic in this protocol.

H. Titrate dosing of parenteral analgesics based upon patient presentation, vital signs and relief of pain/discomfort. (Example: the total initial dose of parenteral analgesic DOES NOT have to be administered if pain/discomfort control is achieved with lesser amount of analgesic administered.)

I. The administration of oral or intravenous Ondansetron (Zofran) ***may*** be indicated to prevent nausea and vomiting from analgesics and/or pain.

J. If indicated, based upon pain assessment and as vital signs allow, parenteral analgesics may be repeated once (excluding Ketorolac) after 5 minutes of the previous dose. Further dosing per *On-Line Medical Control* approval.

K. If Ketorolac was previously administered IM, a second dose should NOT be administered IM or IV.

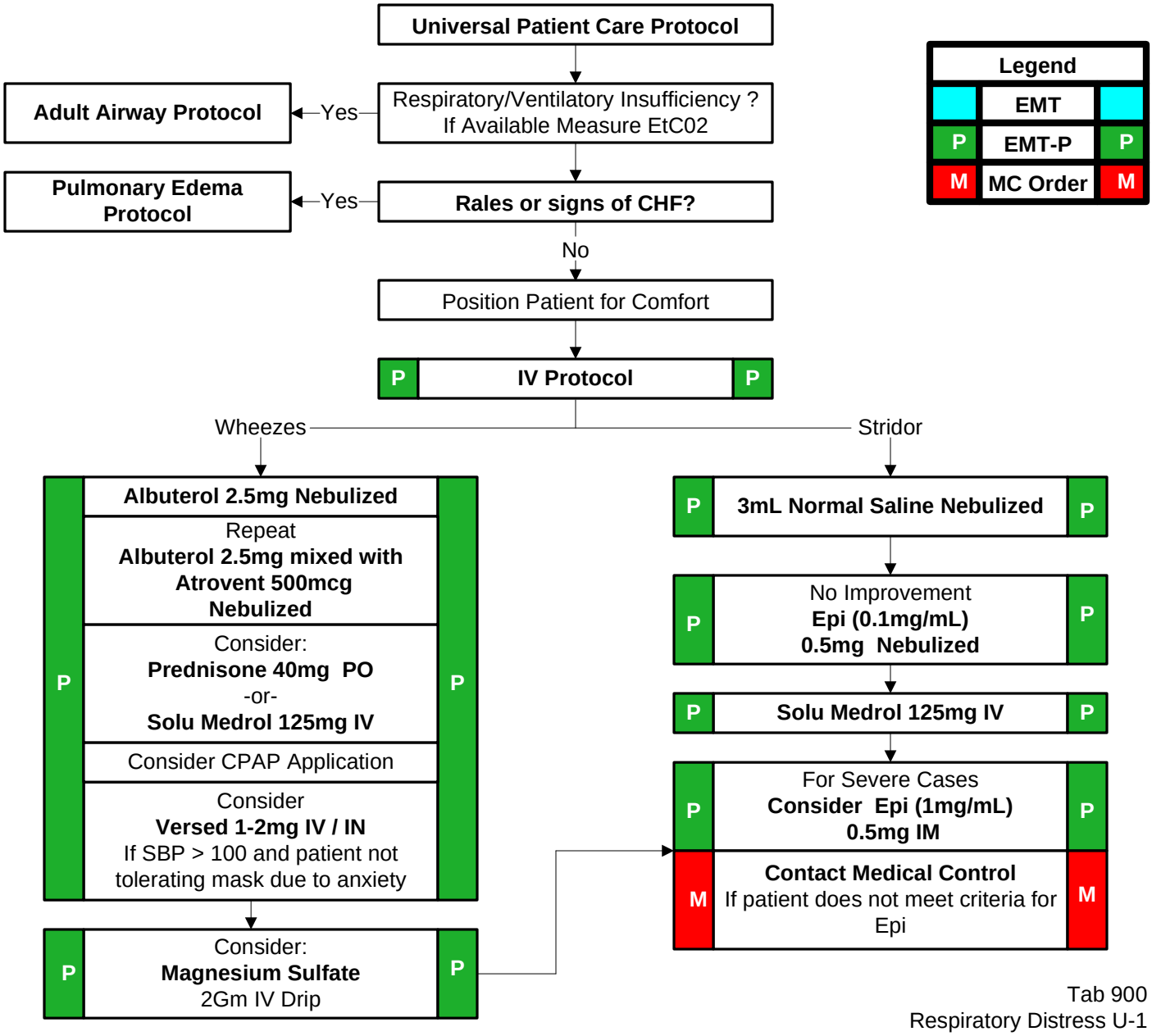
Pain management for patient presentations not addressed by this protocol should receive On-Line Medical Control authorization before administration.

Parenteral Analgesic Dosing Chart

Parenteral Analgesic Dosing Chart		Fentanyl 50mcg/mL	Morphine 10mg/mL	Ketamine 50mg/mL (MC Order)	Toradol 30mg/mL (MC Order)	Dilaudid 1mg/mL (MC Order)
Age	**Ideal Weight**	**1mcg/Kg (IV/IO/IM/IN)**	**0.1mg/Kg (IV/IO/IM)**	**0.25mg/Kg (IV/IO/IM/IN)**	**0.5mg/Kg (IV/IO/IM)**	**0.015mg/Kg (IM/IV/IO)**
Premie	2 KG	0.04mL = 2mcg	0.02mL = 0.2mg	0.01mL = 0.5mg	Safety not established	Not recommended
Newborn	4 KG	0.08mL = 4mcg	0.04mL = 0.4mg	0.02mL = 1.0mg	Safety not established	Not recommended
4 MO	6 KG	0.12mL = 6mcg	0.06mL = 0.6mg	0.03mL = 1.5mg	Safety not established	Not recommended
6 MO	8 KG	0.16mL = 8mcg	0.08mL = 0.0mg	0.04mL = 2.0mg	Safety not established	Not recommended
1 YR	10 KG	0.20mL = 10mcg	0.10mL = 1.0mg	0.05mL = 2.5mg	Safety not established	Not recommended
2 YR	12 KG	0.24mL = 12mcg	0.12mL = 1.2mg	0.06mL = 3.0mg	0.2mL = 6mg	Not recommended
3 YR	15 KG	0.30mL = 15mcg	0.15mL = 1.5mg	0.08mL = 3.75mg	0.25mL = 7.5mg	Not recommended
4 YR	17 KG	0.34mL = 17mcg	0.17mL = 1.7mg	0.09mL = 4.25mg	0.28mL = 8.5mg	Not recommended
5 YR	20 KG	0.40mL = 20mcg	0.20mL = 2.0mg	0.10mL = 5.0mg	0.33mL = 10mg	0.3mL = 0.3mg
6 YR	22 KG	0.44mL = 22mcg	0.22mL = 2.2mg	0.11mL = 5.5mg	0.37mL = 11mg	0.33mL = 0.33mg
7 YR	25 KG	0.50mL = 25mcg	0.25mL = 2.5mg	0.13mL = 6.25mg	0.42mL = 12.5mg	0.38mL = 0.38mg
8 YR	27 KG	0.54mL = 27mcg	0.27mL = 2.7mg	0.14mL = 6.75mg	0.45mL = 13.5mg	0.4mL = 0.4mg
9 YR	30 KG	0.60mL = 30mcg	0.30mL = 3.0mg	0.15mL = 7.5mg	0.5mL = 15mg	0.45ml = 0.45mg
10 YR	35 KG	0.70mL = 35mcg	0.35mL = 3.5mg	0.18mL = 8.75mg	0.5mL = 15mg	0.53mL = 0.53mg
11 YR	40 KG	0.80mL = 40mcg	0.40mL = 4.0mg	0.20mL = 10mg	0.5mL = 15mg	0.6mL = 0.6mg
12 YR	50 KG	1.00mL = 50mcg	0.50mL = 5.0mg	0.25mL = 12.5mg	0.5mL = 15mg	0.75mL = 0.75mg
13 YR	60 KG	1.00mL = 50mcg	0.50mL = 5.0mg	0.30mL = 15mg	0.5mL = 15mg	0.9mL = 0.9mg
ADULT	75 KG	1.00mL = 50mcg	0.75mL = 7.5mg	0.38mL = 18.75mg	0.5mL IV / 1mL IM	1-2mL = 1-2mg
ADULT	100 KG	1.00mL = 50mcg	1.00mL = 10mg	0.50mL = 25mg	0.5mL IV / 1mL IM	1-2mL = 1-2mg

U
Respiratory Distress

History:	Signs / Symptoms:	Differential:
• Asthma • COPD - chronic bronchitis, emphysema, congestive heart failure • Home treatment (oxygen, nebulizer) • Medications (theophylline, steroids, inhalers) • Toxic exposure, smoke inhalation	• Shortness of breath • Pursed lip breathing • Decreased ability to speak • Increased respiratory rate / effort • Wheezing, rhonchi, rales, stridor • Use of accessory muscles • Fever, cough • Tachycardia	• Asthma • Anaphylaxis • Aspiration • COPD (emphysema, bronchitis) • Pleural effusion • Pneumonia • Pulmonary Embolus • Pneumothorax • Cardiac (MI or CHF) • Pericardial tamponade • Hyperventilation • Inhaled toxin (carbon monoxide, etc)



U
Respiratory Distress

Special Considerations:

1. Wheezing is a hallmark indicator of lower airway compromise or obstruction. If there is no patient history of asthma or COPD, consider other processes which may produce wheezing (i.e., foreign body aspiration, pneumonia, pulmonary edema or poisoning).

2. Asthmatics with severe bronchospasm may present with a “silent chest” due to poor air movement through small airways. Forced exhalation or coughing will often accentuate wheezing and careful auscultation of peripheral lung fields will confirm the absence of normal breath sounds.

3. Life-threatening complications of asthma include pneumothorax, cardiac dysrhythmia, bronchial plugging and respiratory failure. Lungs that are hyper-inflated due to air trapping increase the risk of pneumothorax and pneumomediastinum (evaluate for decreased unilateral aeration, subcutaneous emphysema, or acute patient decompensation).

4. Chronic Obstructive Pulmonary Disease (COPD) is characterized by permanent abnormal enlargement of the air spaces beyond the terminal bronchioles and destruction of the alveoli. Life-threatening complications of COPD may include pulmonary hypertension which may lead to Cor Pulmonale.

5. Continuous Positive Airway Pressure (CPAP) has been shown to rapidly improve vital signs, gas exchange, reduce the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in patients who suffer from shortness of breath from asthma, COPD, and pneumonia. Consider CPAP in patients non-responsive to initial treatments. For COPD, Asthma, and Pneumonia start with a 5.0 cm pressure valve setting. If no improvement, and patient is tolerating CPAP, increase pressure valve setting to 7.5 cm. When necessary, bronchodilators should be administered during CPAP operation.

6. With patient anxiety related to CPAP application, consider **Versed 1-2mg IV if SBP > 100mmHg.** Absent IV access, administer Versed IN. Maximum dose of Versed is 2mg IV / IN. Any additional Versed dosing must be authorized by ***On-Line Medical Control.***

Special Considerations (cont.),

7. For patients who present with suspected cardiogenic pulmonary edema, follow the ***Pulmonary Edema Protocol***.

8. Monitor End-Tidal $C0_2$ via 0_2 / $C0_2$ Nasal FilterLine during field treatments (i.e., CPAP, Nebulized Aerosols). Monitor for obstructive capnogram (waveform).

9. Pulse oximetry should be monitored continuously if initial saturation is $\leq$ 96%, or there is a decline in the patient's status despite normal pulse oximetry readings.

10. Nebulized Albuterol (1unit dose – 2.5mg) should be utilized for initial bronchodilator therapy. Patients requiring treatment, and on home Ipratropium Bromide (Atrovent), may have nebulized Atrovent (500mcg) initiated in lieu of Albuterol.

11. For continued auscultated wheezes after initial bronchodilator therapy, continue aerosol treatment with Albuterol (1 unit dose) mixed with Atrovent (1 unit dose). ***This combination therapy is only to be administered once***.

12. For patients with a history of steroid-dependant asthma/COPD, or a patient in continued respiratory distress refractory to nebulized treatments, administer Prednisone 40mg PO. If the patient is unable to swallow, administer Solu-Medrol 125mg IV. **NOTE: Do not administer steroid therapy for patients with history of severe depression or suicidal ideation.**

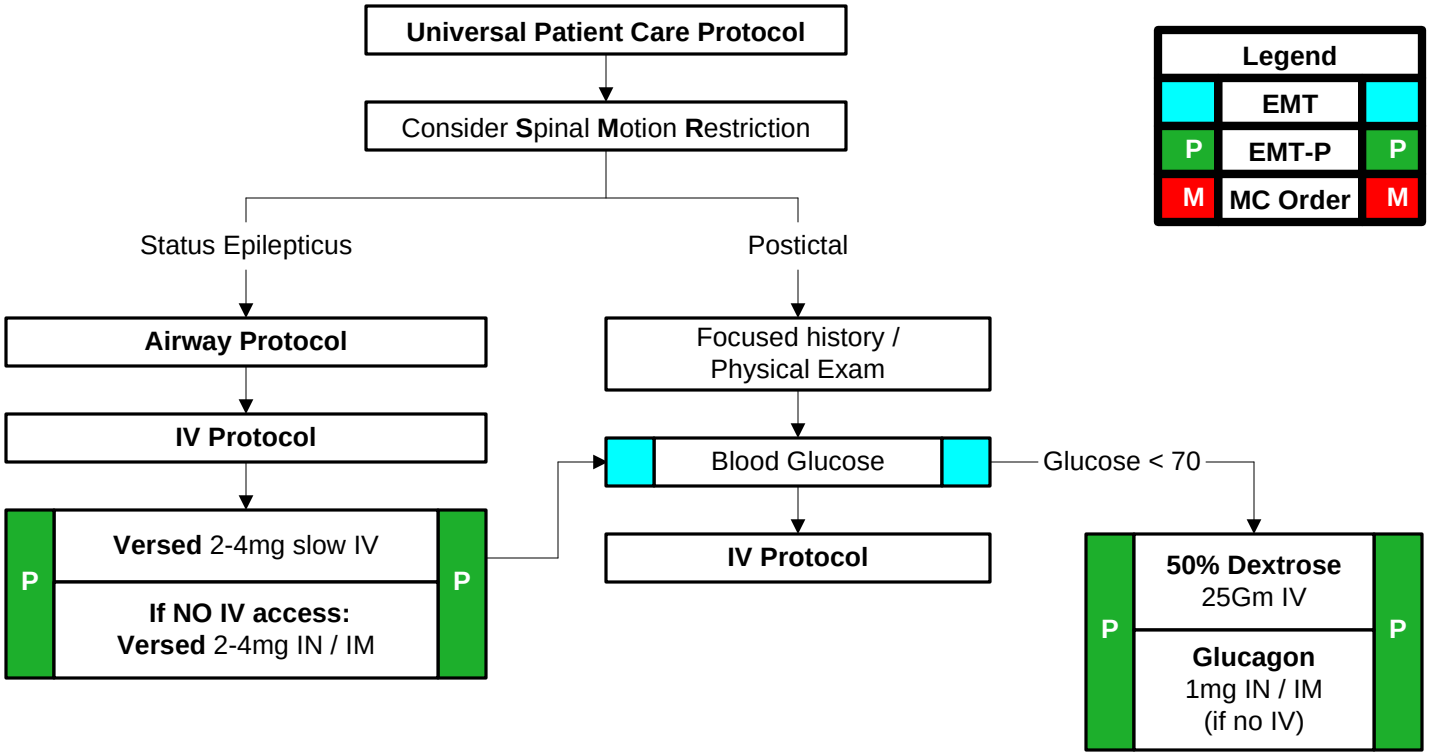
13. Magnesium Sulfate administration can be accomplished by mixing 2 Grams of Magnesium Sulfate in 50mL bag of D5W. With administration set to mini-drip (60gtts), run wide open. Medication will be delivered over 10-20 minutes.

14. Contact ***On-Line Medical Control*** prior to administering Epinephrine to 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.

15. Xopenex may be substituted for Albuterol and mixed with Atrovent. Use the patient current dose (0.31 – 1.25mg).

V
Seizures

History:	Signs / Symptoms:	Differential:
• Reported / witnessed seizure activity • Previous seizure history • Medical alert tag information • Seizure medications • History of trauma • History of diabetes • History of pregnancy	• Decreased mental status • Sleepiness • Incontinence • Observed seizure activity • Evidence of trauma • Unconsciousness	• CNS (Head) trauma • Tumor • Metabolic, Hepatic, or Renal failure • Hypoxia • Electrolyte abnormality (Na, Ca, Mg) • Drugs, medications, non-compliance • Infection / fever • Alcohol withrawal • Eclampsia • Stroke • Hyperthermia • Hypoglycemia



V
Seizures

Special Considerations:

1. If an actively seizing patient is encountered, move hazardous material away from the patient. Protect the patient's head from injury. Remember to always immediately check for pulses after seizure activity stops.

2. Trauma to the tongue during seizure activity is unlikely to cause serious problems. Attempts to force anything into the patient's airway may cause complete obstruction.

3. ***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 that start as a focal seizure and become generalized.

4. Assess possibility of occult trauma and substance abuse. If evidence or suspicion of trauma, consider appropriate spinal motion restriction (SMR).

5. Be prepared for airway problems with continued seizures. The ***Airway Protocol*** should be considered for all patients unable to protect their own airway (i.e., semi-conscious, unconscious).

6. Thiamine 100mg IV should be considered prior to 50% Dextrose administration in patients with possible alcoholism or signs of malnutrition.

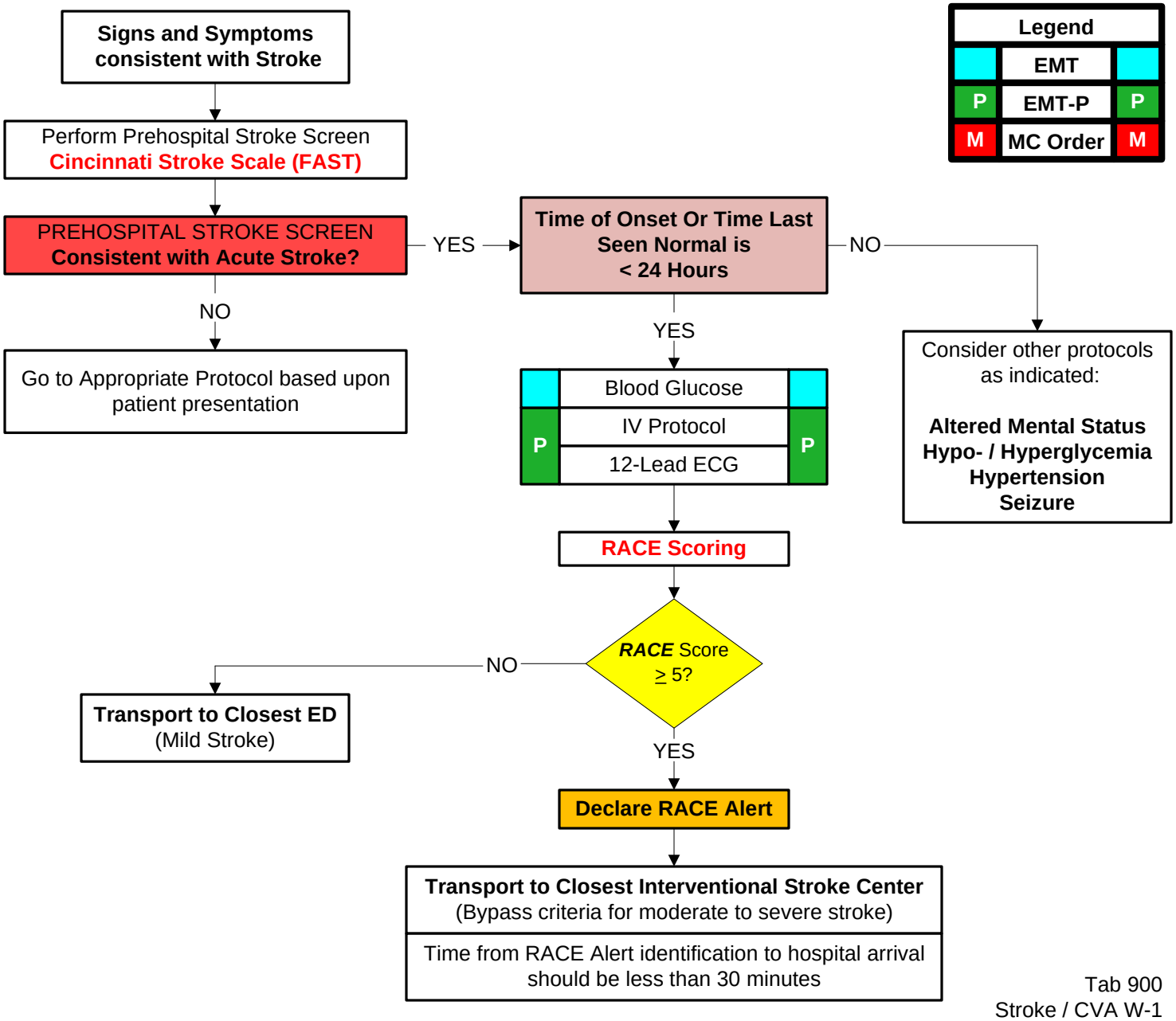
7. For active and/or ongoing seizure activity, administer Versed 2-4mg slow IV. If no intravascular access, administer Versed 2-4mg IN (4mg IM)**.** Maintain a blood pressure > 100mmHg. Versed may be repeated in 5 minutes x 1 for cessation of seizure activity. Any additional dosing of Versed must be authorized by ***On-Line Medical Control.*** **NOTE: The following guidelines must be followed for Versed administration:**
    a. **Frequent assessment of airway for compromise requiring assistance**
    b. **Continuous pulse oximetry monitoring**
    c. **If advanced airway placed, continuous end-tidal C02 monitoring (confirmed capnographic waveform).**
    d. **Frequent assessment of blood pressure. Maintain SBP > 100mmHg.**

Special Considerations (cont.),

8. For seizure activity related to Eclampsia, follow the **Obstetrical Emergencies Protocol (Tab 900, Section N).**

W
Stroke / CVA

History:	Signs / Symptoms:	Differential:
• Previous CVA, TIA's • Previous cardiac / vascular surgery • Associated diseases: diabetes, hypertension, CAD • Atrial fibrillation • Medications (blood thinners) • History of trauma	• Altered mental status • Weakness / Paralysis • Blindness or other sensory loss • Aphasia / Dysarthria • Syncope • Vertigo / Dizziness • Vomiting • Headache • Seizures • Respiratory pattern change • Hypertension / hypotension	• See Altered Mental Status • TIA (Transient Ischemic Attack) • Seizure • Hypoglycemia • Stroke Thrombotic, Embolic (85%) Hemorrhagic (15%) • Tumor • Trauma • Dialysis / Renal Failure



W
Stroke / CVA

Special Considerations:

1. A stroke is a sudden interruption in blood flow to the brain resulting in neurological deficit. It affects 750,000 Americans each year, is the 3rd leading cause of death and is the leading cause of adult disability. With new treatment options available, EMS personnel should alert Medical Control as quickly as possible whenever a potential stroke patient is identified.

2. The most common causes of stroke are:
    a. **Cerebral thrombosis** (a blood clot obstructing the artery).
    b. **Cerebral embolus** (a mass or air bubble obstructing the artery).
    c. **Cerebral hemorrhage** (ruptured artery / ruptured aneurysm).

3. Signs and symptoms of stroke include:
    a. Hemiplegia (paralysis on one side of the body)
    b. Hemiparesis (weakness on one side of the body)
    c. Decreased sensation or numbness without trauma
    d. Facial droop
    e. Unequal grips
    f. Dizziness, vertigo or syncope
    g. Aphasia or slurred speech
    h. Altered level of consciousness or seizures
    i. Sudden, severe headache with no known cause
    j. Visual disturbances (e.g. blurred vision, double vision)
    k. Generalized weakness
    l. Frequent or unexplained falls

4. Risk factors that increase the likelihood of stroke are:
    a. Hypertension
    b. Atherosclerosis / coronary artery disease
    c. Atrial fibrillation
    d. Hyperlipidemia
    e. Diabetes
    f. Vasculitis
    g. Lupus

Special Considerations (cont.),

5. To facilitate accuracy in diagnosing stroke and to expedite transport, an easy-to-use neurological examination tool is recommended. Utilize the ***Cincinnati Prehospital Stroke Screen (CPSS)*** for evaluation of acute, non-comatose, non-traumatic neurovascular complaints. The CPSS evaluates using **FAST** criteria (**F**acial palsy, **A**rm weakness, **S**peech abnormalities, **T**ime of onset). **If any one of the three components of the CPSS is abnormal, the probability of stroke is 72%.**

6. Onset of stroke symptoms ***(Time Last Seen Normal***) 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 evening when the patient was symptom-free). With duration of symptoms less than 24 hours, scene times should be limited to 10-15 minutes, early notification of receiving facility should be performed and transport times should be minimized.

7. Patients assessed with a RACE Score of $\geq$ 5 (moderate to severe stroke) should be transported/diverted to the closest Interventional Stroke Center. Declare a ***RACE ALERT*** through LCEMS dispatch and the appropriate RACE Center will be assigned for Medical Control Contact and transport. ***(RACE Interventional Stroke Centers: UTMC; Promedica Toledo; Mercy St. Vincent, St. Luke's).***

8. Pediatric patients with a RACE Score of $\geq$ 5 (moderate to severe stroke) should be transported /diverted to the closest Interventional Stroke Center. Declare a ***RACT ALERT*** through LCEMS dispatch and the appropriate RACE Center will be assigned for Medical Control Contact and transport. ***(RACE Interventional Stroke Centers for pediatrics: Promedica Toledo; Mercy St. Vincent).***

9. Patients assessed with a RACE Score of < 5 (mild stroke) will be transported to the closest emergency department assigned by LCEMS dispatch.

Special Considerations (cont.),

10. ALS care for stroke patients should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for/providing patient transportation. Maintain the head/neck in neutral alignment. Elevate the head of the cot 30 degrees if the systolic BP is > 100mmHg (this will facilitate venous drainage and help reduce ICP).

11. Blood pressure increase is common with CVA. Evaluate if BP increase is acceptable or due to causative factors (i.e., Hypoxia, Full Bladder, Pain, etc.). Consider treating hypertension if SBP is > 220mmHg or DBP > 120-140mmHg.

12. Whenever possible, a family member should accompany the patient to the hospital to provide additional history and/or consent.

13. Be alert for airway problems (difficulty swallowing, vomiting).

14. Hypoglycemia can present as a localized neurologic deficit, especially in the elderly. If BS is < 60mg/dl, administer 50% Dextrose IV. Thiamine 100mg IV should be considered prior to Dextrose administration in patients with possible alcoholism or signs of malnutrition.

15. Bradycardia may be present in a suspected stroke patient due to increased ICP. Do not give Atropine if the patient's BP is normal or elevated.

16. SMR precautions should be provided if the patient sustained a fall or other trauma.

Special Considerations (cont.),

Mobile Stroke Unit (MSU) - Patient interaction considerations in Lucas County Response Area:

- **MSU Dispatch:** The Mobile Stroke Unit (MSU) will be dispatched in Lucas County to all 'Stroke-Type' incidents when the estimated time of arrival (CAD recommendation) is within 15 minutes of incident processing.

- **EMS Declared RACE Patient (Score ≥ 5):** In the event that a 'RACE ALERT' is declared by on-scene EMS prior to MSU scene arrival, the Mobile Stroke unit shall be cancelled in preference of continued assessment, treatment and transport by a LCEMS Life Squad to a designated RACE Interventional Stroke Center.

- **Non-RACE Patient (Score < 5):** Scene EMS personnel shall factor timeliness of MSU arrival for continued scene response. The MSU staff will interact with field EMS crews for continued assessment and treatment. The MSU, through the use Telemedicine communication with a neurologist, will determine the necessity of CT scanning and transport by MSU. Patients transferred into the MSU for purposes of CT scanning will be transported by the MSU. Patients not requiring CT scan, and not committed to the MSU vehicle, will be transported by conventional EMS means (i.e., private ambulance, FD agency ambulance or LS).

Cincinnati Prehospital Stroke Scale (CPSS)

Facial Droop	Normal:	Both sides of face move equally
	Abnormal:	One side of face does not move at all
Arm Drift	Normal:	Both arms move equally or not at all
	Abnormal:	One arm drifts compared to the other
Speech	Normal:	Patient uses correct words with no slurring
	Abnormal:	Slurred or inappropriate words or mute

Time of Onset

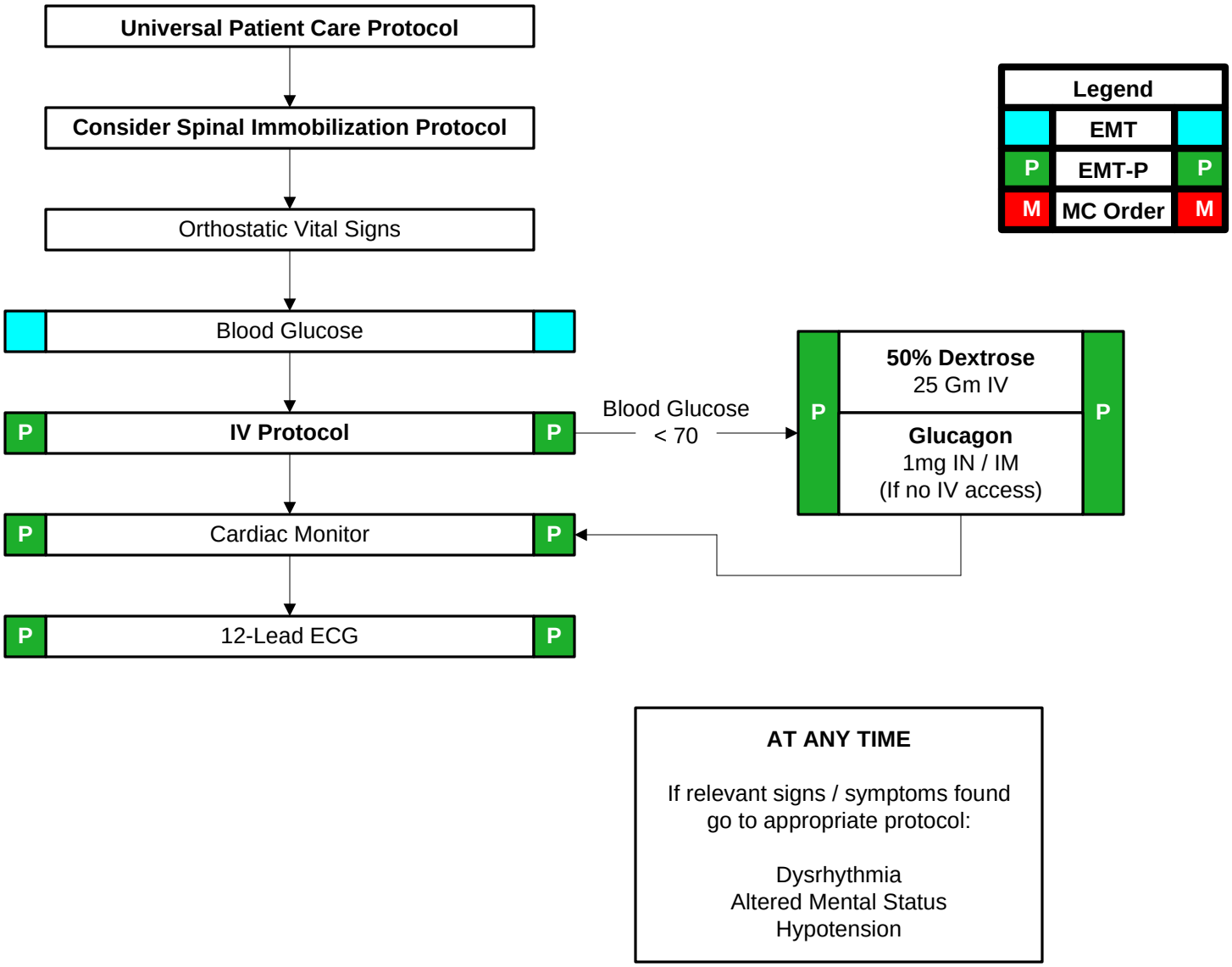
W
Stroke / CVA

RACE Score Sheet: Circle one number for each item

Item	Instruction	Patient Response	RACE Score
Facial Palsy	Ask the patient to show teeth	Absent (symmetrical movement) Mild (slightly asymmetrical) Moderate to Severe (completely asymmetrical)	0 1 2
Arm Motor Function	Extending the arm of the patient 90 degrees (if sitting) or 45 degrees (if supine)	Normal to Mild (limb upheld more than 10 seconds) Moderate (limb upheld less than 10 seconds) Severe (patient does not raise the arm against gravity)	0 1 2
Leg Motor Function	Extending the leg of the patient 30 degrees (in supine position)	Normal to Mild (limb upheld more than 5 seconds) Moderate (limb upheld less than 5 seconds) Severe (patient does not raise leg against gravity)	0 1 2
Head / Gaze Deviation	Observe eyes and head deviation to one side	Absent (eye movements to both sides were possible and no head deviation observed) Present (eyes and head deviation to one side observed)	0 1
Aphasia (if right hemiparesis	Ask the patient two verbal orders: -"close your eyes" -"make a fist"	Normal (performs both tasks correctly) Moderate (performs one task correctly) Severe (performs neither task)	0 1 2
Agnosia/Neglect (if left hemiparesis	Asking: -"Whose arm is this?" while showing him/her the impaired arm -"Does this arm feel weak to you?"	Normal (recognizes arm and the impairment Moderate (does not recognize arm or impairment) Severe (does not recognize arm and impairment)	0 1 2
	RACE Score Total:		

X
Syncope

History:	Signs / Symptoms:	Differential:
• Cardiac history, stroke, seizure • Occult blood loss (GI, ectopic) • Females: LMP, vaginal bleeding • Fluid loss: nausea, vomiting, diarrhea • Past medical history • Medications	• Loss of consciousness with recovery • Lightheadedness, dizziness • Palpitations, slow or rapid pulse • Pulse irregularity • Decreased blood pressure	• Vasovagal • Orthostatic hypotension • Cardiac syncope • Micturation / Defecation syncope • Psychiatric • Stroke • Hypoglycemia • Seizure • Shock (see Shock Protocol) • Toxicologic (Alcohol) • Medication effect (hypotension)



AT ANY TIME

If relevant signs / symptoms found go to appropriate protocol:

Dysrhythmia
Altered Mental Status
Hypotension

X
Syncope

Special Considerations:

1. Syncope is defined as a transient state of unconsciousness from which the patient has recovered. If patients present with altered mentation, treat per the **Altered Mental Status Protocol (Tab 900, Section E).**

2. Most syncope is vasovagal in nature and characterized by dizziness progressing to fainting/unconsciousness which may last for several minutes. For many patients, recumbent positioning may be sufficient to restore vital signs and level of consciousness to within normal values. Syncope which occurs without warning is potentially serious and often caused by cardiac arrhythmia.

3. Assess for signs and symptoms of trauma if associated or questionable fall with syncope.

4. Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible cause of syncope. More than 25% of geriatric syncope is cardiac arrhythmia based.

5. Orthostatic measurement of vital signs can help determine if a patient requires fluid replacement or more extensive testing or treatment. When appropriate, orthostatic vital signs should be acquired to assess for possible volume depletion. Follow the ***Orthostatic Vital Signs Protocol (Tab 500).***

6. Thiamine 100mg IV should be considered prior to 50% Dextrose administration in patients with possible alcoholism or signs of malnutrition.

Y
Universal Patient Care Protocol

Legend		
	EMT	
P	EMT-P	P
M	MC Order	M

Scene Safety
Bring all necessary equipment to patient's side
Demonstrate professionalism and courtesy

↓

PPE (Consider Airborne or Droplet if indicated)

↓

Initial Assessment

BLS Maneuvers
Consider Spinal Immobilization
If Pediatric Patient, consider Broselow Tape

Cardiac Arrest → Go to appropriate protocol:

Cardiac Arrest
Ventricular Fibrillation
Pulseless Ventricular Tachycardia
Pulseless Electrical Activity
Asystole
Pediatric Pulseless Arrest

↓

Airway Procedures (if required)
(Adult or Pediatric)

↓

Vital Signs

(Temperature and Blood Glucose measurement when appropriate)

↓

Consider
Pulse SP02-CO Oximetry/Supplemental 02

↓

Consider
Cardiac Monitor/12-Lead ECG

↓

Appropriate Protocol

→ M Patient doesn't fit a protocol? Contact ***On-Line Medical Control*** M

Y
Universal Patient Care

Special Considerations:

1. Any patient contact which does not result in a Life Squad transport, regardless of ***On-Line Medical Control*** contact, must have a complete ePCR tablet entry.

2. Minimal patient exam, if not noted on specific protocol includes: Vital signs, mental status, and location of injury or complaint.

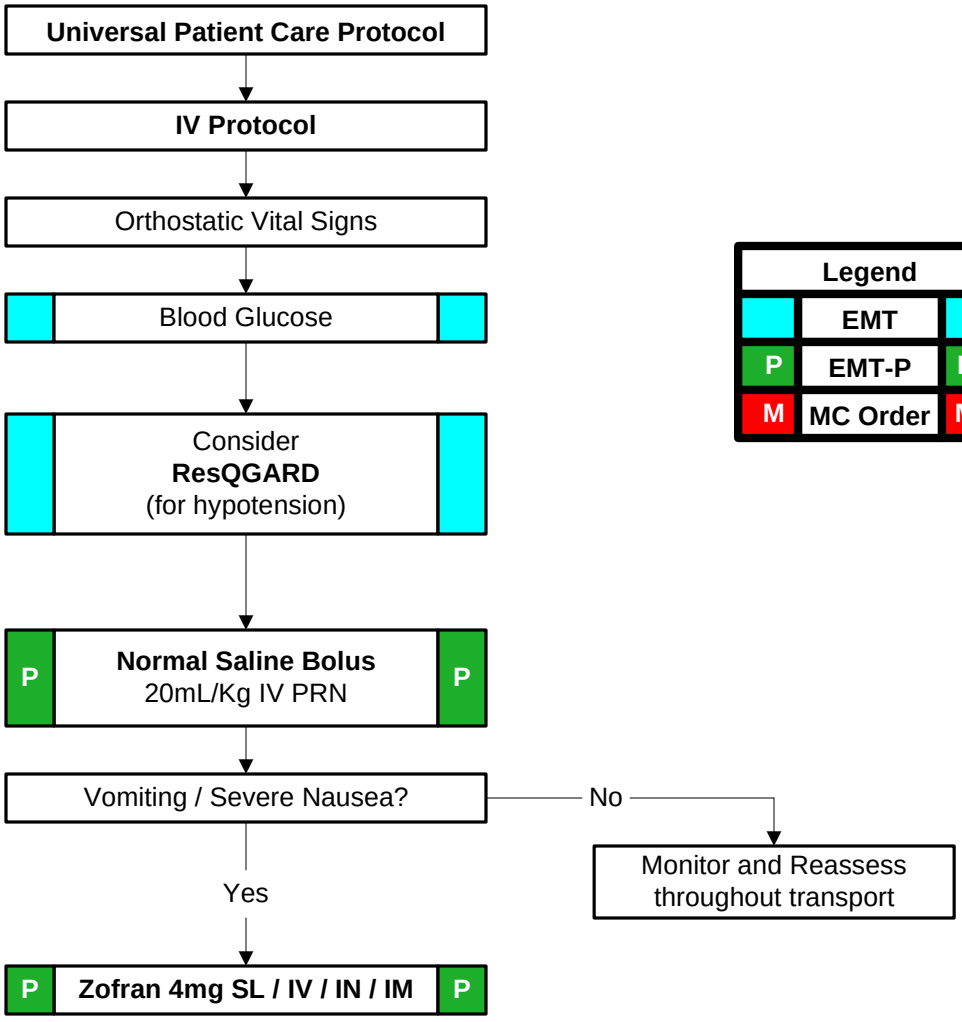
3. Required vital signs on every patient include blood pressure, pulse, respirations, pain/ severity.

4. Pulse Sp02/CO oximetry, glucose measurement and temperature documentation is dependent on the specific complaint.

5. Timing of transport, if indicated, should be based upon the patient's clinical condition and the transport policy.

Z
Vomiting and Diarrhea

History:	Signs / Symptoms:	Differential:
• 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 • Medications • Menstrual history (pregnancy) • Travel history • Bloody emesis / diarrhea	• Pain • Character of pain • Distention • Constipation • Diarrhea • Anorexia • Radiation **Associated symptoms:** **(Helpful to localize source)** Fever, headache, blurred vision, weakness, malaise, cough, headache, dysuria, mental status changes, rash	• CNS • Myocardial infarction • Drugs (NSAID's, antibiotics, narcotics, chemotherapy) • GI or renal disorders • Diabetic ketoacidosis • Gynecologic disease • Infections (pneumonia, influenza) • Electrolyte abnormalities • food or toxin induced • Medication or substance abuse • Pregnancy • Psychological



Z
Vomiting and Diarrhea

Special Considerations:

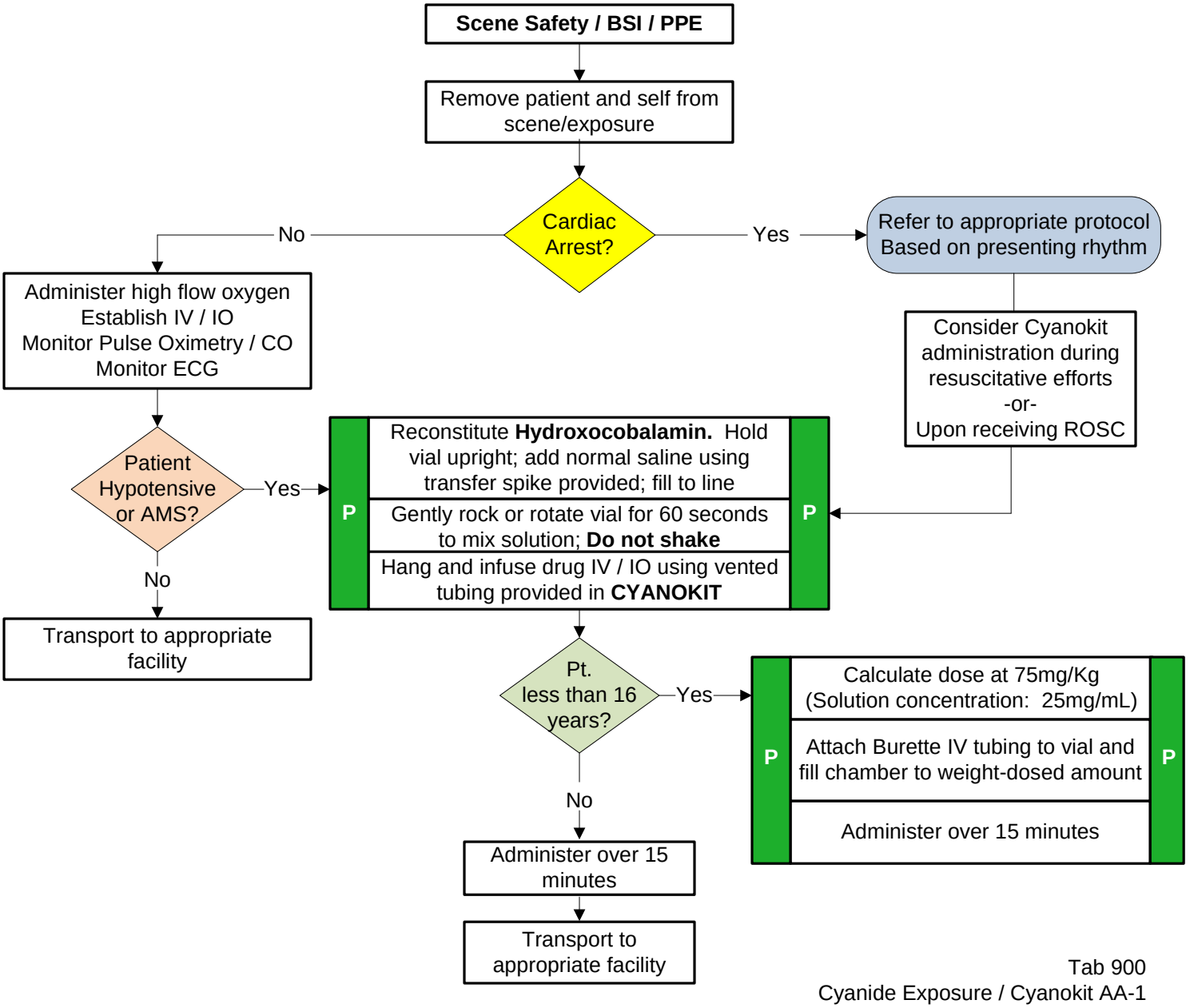
1. The list of differentials for nausea and vomiting is long. Attempt to identify underlying conditions.

2. Vomiting and diarrhea may be symptoms of a more serious underlying problem. Maintain high suspicion of a cardiac event for persons with diabetes or neuropathies.

3. For severe nausea and/or vomiting administer Zofran 4mg SL / IV / IN / IM. Zofran may be repeated x 1 in 5-10 minutes PRN.

AA
Cyanide Exposure
Cyanokit (Hydroxocobalamin)

History:	Signs / Symptoms (CN Exposure):	Differential:
• Patient extricated from fire with hypotension, AMS, or cardiac arrest • Patient found in area with known or suspected cyanide exposure	• Dyspnea • Tachypnea • Tachycardia / Bradycardia • Headache • Dizziness / Confusion • Generalized weakness • Bizarre behavior • Excessive sleepiness / Coma • Flushed • Bitter almonds smell • Cardiac Arrest	• Possible cyanide poisoning



AA
Cyanide Exposure
Cyanokit® (Hydroxocobalamin)

Cyanide can be found in a liquid (solutions of cyanide salts), solid (cyanide salts), or gaseous (hydrogen cyanide) form. In solid form, it is white and has a faint almond odor (20% of the population is genetically unable to detect the odor). Hydrogen cyanide gas may be formed when acid is added to cyanide salt, a nitrite, or when plastics burn. If a large amount of liquid or solid cyanide material is present on the victim's clothing or skin, it poses a significant risk of exposure to rescuers. Exposure can occur through skin absorption, eye contact, inhalation, and ingestion. If the patient is unconscious and is being rescued from a fire, there is a high probability of concurrent carbon monoxide and cyanide poisoning; both conditions must be treated.

Cyanide (CN) is an often unrecognized danger in closed-space fires:

- CN can be released by virtually any material containing carbon and nitrogen when burned under high temperature and low oxygen conditions.
- There is potential for CN toxicity due to the increased use of synthetic materials that produce CN during combustion in closed-space fires.
- Moderate to high concentrations of CN can cause severe injury or death in minutes.
- CN poisoning may also cause central nervous system side effects including intellectual impairment, Parkinson-type effects, and personality changes.

Common building materials known to release high levels of CN during combustion:

- Glass fiber (building insulation wool)
- Melamine (laminate for building construction)
- PIR (thermal insulation foam)
- Nitrile rubber (tubing insulation)
- Rigid PUR (building insulation foam)
- Particle board (laminate for building base material)

Currently there is no diagnostic test to confirm CN poisoning within the limited window for initiating lifesaving intervention:

- Even at most hospitals, rapid measurements of CN are not available.
- Lactate levels may be tested as levels increase proportionally with the amount of CN poisoning because of metabolic acidosis.

AA
Cyanide Exposure
Cyanokit® (Hydroxocobalamin)

Cyanide Exposure / Cyanokit, (cont.)

CN and carbon monoxide (CO) poisoning can be difficult to differentiate due to common signs and symptoms.

Moderate to Severe Poisoning Signs / Symptoms

Cyanide	Common to Both	Carbon Monoxide
Cardiovascular collapse	Altered level of consciousness	Severe headache
Hypotension	Respiratory arrest	Shock and death
Almond odor on breath	Cardiac dysrhythmia	
	Seizure	
	Lactic acidemia	

Because CN poisoning prevents cells from using oxygen, signs and symptoms of CN poisoning also mimic those of oxygen deprivation.

Identifying Patients with Cyanide Poisoning:
The presence and extent of cyanide poisoning are often initially unknown. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication. If clinical suspicion of cyanide poisoning is high, Cyanokit should be administered without delay.

Common Signs and Symptoms of Cyanide Poisoning

Symptoms	Signs
• Headache	• Altered Mental Status
• Confusion	• Seizures or Coma
• Dyspnea	• Mydriasis
• Chest tightness	• Tachypnea (early)
• Nausea	• Hypotension (late)
	• Bradypnea / Apnea (late)
	• Hypertension (early)
	• Cardiovascular collapse
	• Vomiting

AA
Cyanide Exposure
Cyanokit® (Hydroxocobalamin)

Cyanide Exposure / Cyanokit, (cont.)

Smoke Inhalation
Not all smoke inhalation victims will have cyanide poisoning and may present with burns, trauma, and exposure to other toxic substances making a diagnosis of cyanide poisoning particularly difficult. Prior to administration of Cyanokit, smoke inhalation victims should be assessed for the following:

When to suspect Cyanide Poisoning:
- Exposure to fire or smoke in an enclosed area
- Soot around the mouth, nose, or back of mouth
- Altered mental status (eg, confusion, disorientation)

Cyanokit® Dosage and Administration
Comprehensive treatment of acute cyanide intoxication requires support of vital functions. Cyanokit should be administered in conjunction with appropriate airway, ventilatory and circulatory support.

NOTE:
- **If patient is exposed to gas only and does not have skin or ocular irritation, no decontamination is needed.**
- **If patient is exposed to liquid, decontamination required. Avoid self-contamination**

The starting dose of Hydroxocobalamine for adults is 5Gm administered as an intravenous infusion over 15 minutes (approximately 15mL/min). Administration of the entire vial constitutes a complete starting dose.

Preparation of Solution for Infusion

1. Initiate a dedicated IV line.

2. Reconstitution: Add 200mL of 0.9% sodium chloride injection to the vial using the supplied sterile transfer spike. Fill to the line (with the vial in an upright position).

3. Mix: Rock, swirl, or rotate the vial for 60 seconds to mix the solution. Do not shake

4. Infuse the contents of the vial: Use vented IV tubing (included with kit) and piggyback to IV line. Infuse over 15 minutes

AA
Cyanide Exposure
Cyanokit® (Hydroxocobalamin)

Cyanide Exposure / Cyanokit, (cont.)

Pediatric Considerations for Cyanokit Administration (< 16 years of age)

- Calculate dose at 75mg/Kg (Solution concentration: 25mg/mL).
- Attach Burette IV tubing to vial and fill chamber to weight-dosed amount.
- Infuse over 15 minutes

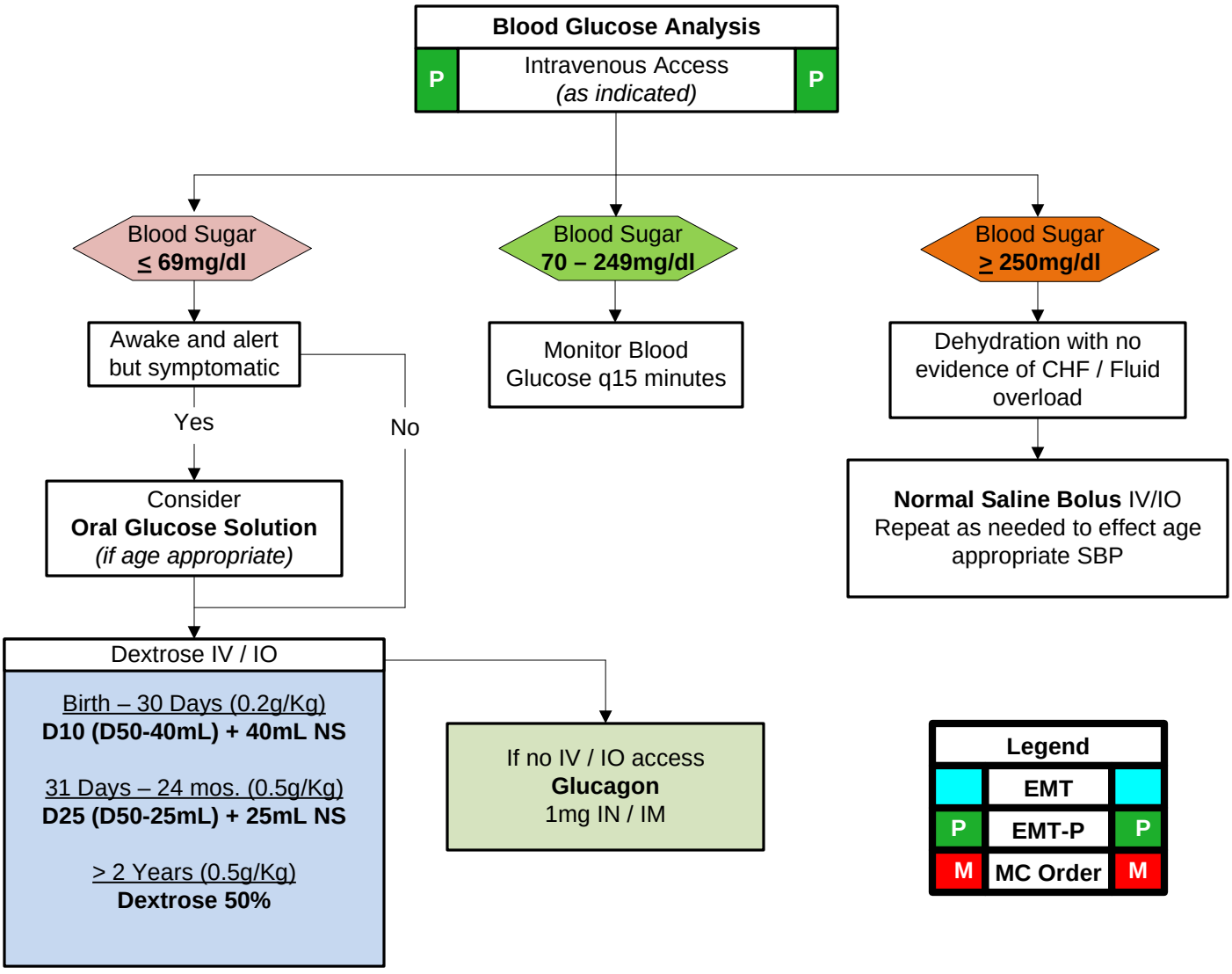
Cyanokit Dosing
Pediatric (< 16 years of age)

Weight in Kg	Dose in ML
3kg	9mL
5kg	15mL
7kg	21mL
9kg	27mL
11kg	33mL
13kg	39mL
15kg	45mL
20kg	60mL
25kg	75mL
30kg	90mL
35kg	105mL
40kg	120mL
45kg	135mL
50kg	150mL
55kg	165mL
60kg	180mL
65kg	195mL
70kg ≤	200mL/ Full Dose

AA
Cyanide Exposure
Cyanokit® (Hydroxocobalamin)

BB
Hypo- / Hyperglycemia

History:	Signs / Symptoms:	Differential :
• Past medical history • Known diabetic, medic alert tag • Medications • Recent illness • Recent blood glucose check • Last meal • Change in condition	• Altered mental status • Combative / irritable • Diaphoresis • Seizures • Abdominal pain • Nausea / vomiting • Weakness • Dehydration • Deep / rapid breathing	• Alcohol / drug use • Toxic ingestion • Trauma; head injury • Seizure • CVA • Altered baseline mental status



BB
Hypo- / Hyperglycemia

Special Considerations:

1. It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after therapy with IV Dextrose or IN / IM Glucagon.

2. Do not administer oral glucose to patients that are not able to swallow or protect their airway.

3. The following Dextrose concentrations are recommended:

Age	Dextrose Concentration
Birth – 30 Days (0.2Gm/Kg)	D10 (D50 – 40mL) + 40mL NS
31 Days – 24 Mos. (0.5Gm/Kg)	D25 (D50 – 25mL) + 25mL NS
> 2 Years (0.5Gm/Kg):	Dextrose 50%

4. Maximum Dextrose administration is 50mL of age-appropriate concentration. Additional amounts must be authorized by ***On-Line Medical Control***.

5. Thiamine 100mg IV should be considered prior to 50% Dextrose administration in patients with possible alcoholism or signs of malnutrition.

6. For symptomatic patients with low blood sugar values, and absent intravenous access, administer Glucagon IN / IM. Maximum dose of Glucagon is 1mg.

7. Patients with prolonged hypoglycemia may not respond to Glucagon.

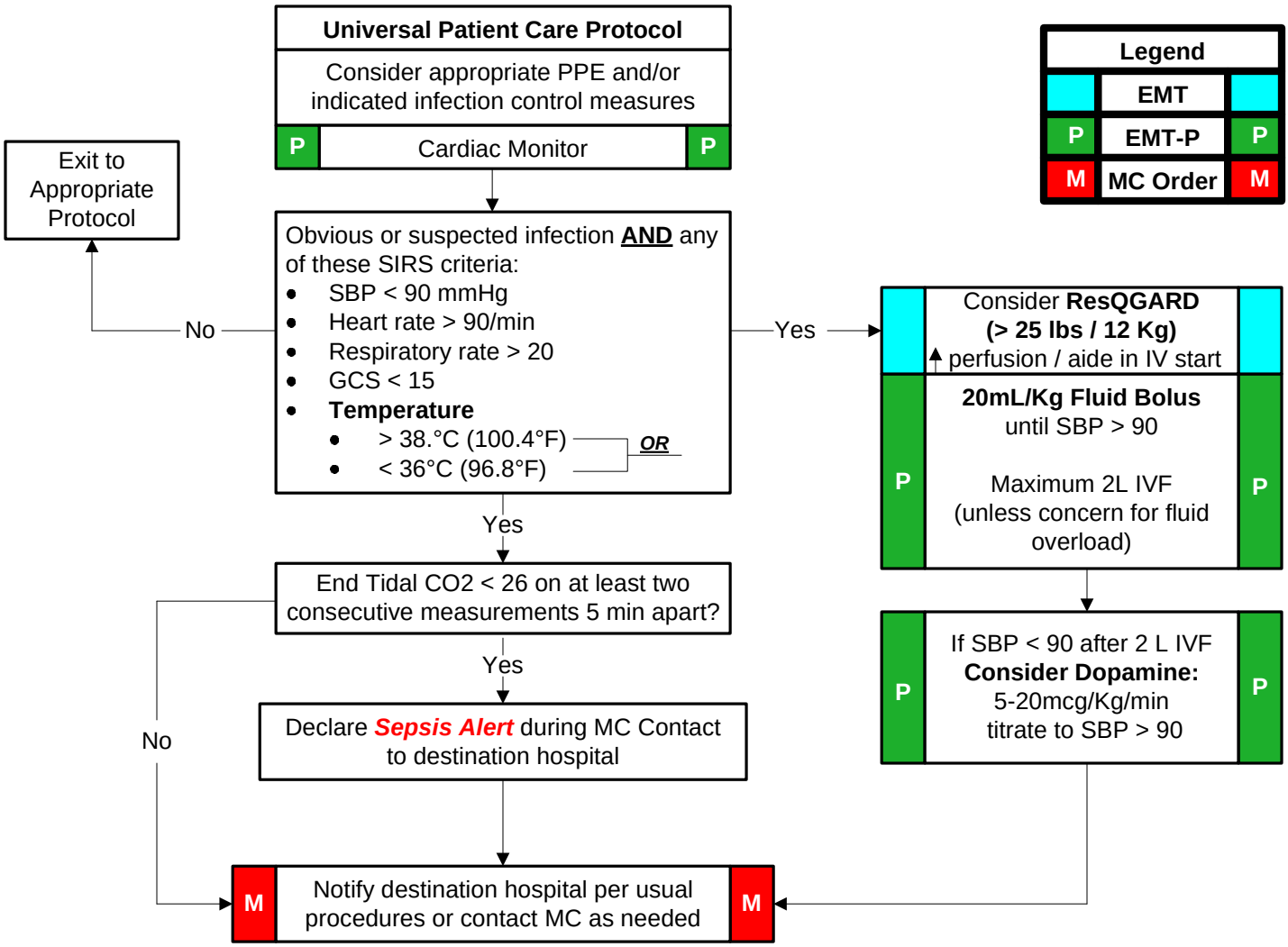
8. For patients with altered mentation and combative / aggressive behavior, consider restraints for patient's and/or personnel's protection.

9. The Airway Protocol should be considered for all patients unable to protect their own airway (i.e., semi-conscious, unconscious).

10. ***On-Line Medical Control*** contact is **required** for any treat/release or refusal of treatment and/or transport with appropriate signatures obtained on the ePCR.

CC
Sepsis / Septic Shock

History:	Signs / Symptoms:	Differential:
• Age (common in elderly and very young) • Presence and duration of fever • Previously documented infection or illness (UTI, pneumonia, meningitis, encephalitis, cellulitis, abscess, etc.) • Recent surgery or invasive procedure • Immunocompromised (transplant, HIV, diabetes, cancer) • Bedridden or immobile patients • Prosthetic or indwelling devices • Immunization Status	• Hyper- or hypothermia • Rash and/or excessive bruising • Chills • Myalgia (muscle aches) • Markedly decreased urine output • Altered mentation • Delayed capillary refill • Elevated blood glucose (unless diabetic)	• Cardiogenic shock • Hypovolemic shock • Dehydration • Hyperthyroidism • Medication / drug interaction • Non-septic infection • Allergic reaction / anaphylaxis • Toxicological emergency



CC
Sepsis / Septic Shock

Sepsis is a rapidly progressing, life-threatening condition due to systemic infection. Sepsis must be recognized early and treated aggressively to prevent progression to shock and death. Sepsis can be identified when the following markers of the Systemic Inflammatory Response Syndrome (SIRS) are present in a patient with suspected infection:

- Temperature > 38°C (100.4°F) OR < 36°C (96.8°F)
- Respiratory Rate > 20 breaths/min
- Heart Rate > 90 beats/min
- End tidal CO2 < 26 mmHg OR Lactate > 4mMol

In addition to physiologic markers of SIRS, severe sepsis may cause hypoxia and inadequate organ perfusion, resulting in metabolic acidosis marked by elevated blood lactate levels and decreased ETCO2 levels (measured by capnography).

Special Considerations for Sepsis:

1. Early recognition of Sepsis allows for attentive care and early administration of antibiotics.
2. Aggressive IV fluid therapy is the most important prehospital treatment for sepsis. Suspected septic patients should receive 20mL/Kg fluid bolus **(to a maximum of 2 Liters)** while being checked frequently for signs of pulmonary edema, especially patients with known history of CHF or ESRD on dialysis. STOP fluid administration in the setting of pulmonary edema.
3. Attempt to identify source of infection (skin, respiratory, etc.) and relay previous treatments and related history to the receiving ED physician.
4. Elevated serum lactate levels are a useful marker of hypoperfusion in sepsis and often become elevated prior to the onset of hypotension. End tidal CO2 levels are correlated with lactate levels.
5. Disseminated Intravascular Coagulation (DIC) is an ominous, late stage manifestation of sepsis characterized by frank, extensive bruising, bleeding from multiple sites and finally tissue death.

Special Considerations for Sepsis (cont.):

Sepsis Alert

The purpose of a Sepsis Alert is to provide pre-arrival Emergency Department notification in order to facilitate rapid assessment and treatment of a suspected severe sepsis patient. Sepsis Alert patients should be transported to a hospital with on-site intensive care service (NOT a free standing Emergency Department).

A ***Sepsis Alert*** will be declared for patients meeting the following 3 criteria:

1. Suspected infection
2. Two or more of the following:
    - Temperature > 38°C (100.4°F) OR < 36°C (96.8°F)
    - Respiratory rate > 20 breaths/min
    - Heart rate > 90 beats/min
3. ETCO2 < 26 mm Hg OR Lactate > 4 mMol

Advanced Life Support:

- Full ALS assessment and treatment
- Notify hospital of incoming ***Sepsis Alert*** prior to arrival
- Consider ResQGARD (ITD) to increase perfusion / aide in IV start
- Administer 20mL/Kg fluid bolus until SBP > 90 mmHg
- Total amount of IVF should not exceed 2 Liters
- If SBP remains < 90 mm Hg following fluid administration: Dopamine infusion at 5-20 mcg/kg/min titrated to maintain SBP > 90 mmHg

Special Considerations for Sepsis (cont.):

Pediatric Considerations (Sepsis):

- Consider possible sources of infection in the pediatric population:
  - ü Ears (otitis media)
  - ü Infected wounds
  - ü Strep Pharyngitis
  - ü Conjunctivitis
  - ü Etc.

- Up to 15% of febrile patients between the age of 3 and 36 months with no obvious source of infection will have occult bacterial infections.

- The mortality rate for sepsis is age-dependent. The neonate has the highest morbidity and mortality from serious bacterial infection.

- A septic child may look ill and have ashen color, pallor and/or cyanosis. He or she may be irritable or lethargic, febrile, normothermic or hypothermic. Most have tachycardia and tachypnea. In the late stages the child may hypoventilate with poor perfusion. Parents usually report the child has been fussy, lethargic, anorectic, and perhaps sleeping more than usual.

- **Differential (Peds):** There are numerous disorders that can cause a child to appear septic including viral infections, cardiac diseases, endocrine, genitourinary, metabolic, hematologic, gastrointestinal disorders, neurologic disease and child abuse.

- IV fluid therapy is the most important prehospital treatment for sepsis. Suspected pediatric septic patients should receive 20mL/Kg fluid bolus to maintain age-appropriate SBP (SBP $\geq$ 70 + 2 x age) - maximum of 2 Liters while checking patient frequently for signs of pulmonary edema. STOP fluid administration in the setting of pulmonary edema.

- For the pediatric patient follow the Handtevy dosing guide for fluid and, if necessary, vasopressor (Dopamine) administration.