

TAB 6

ENVIRONMENTAL |

EXPOSURE

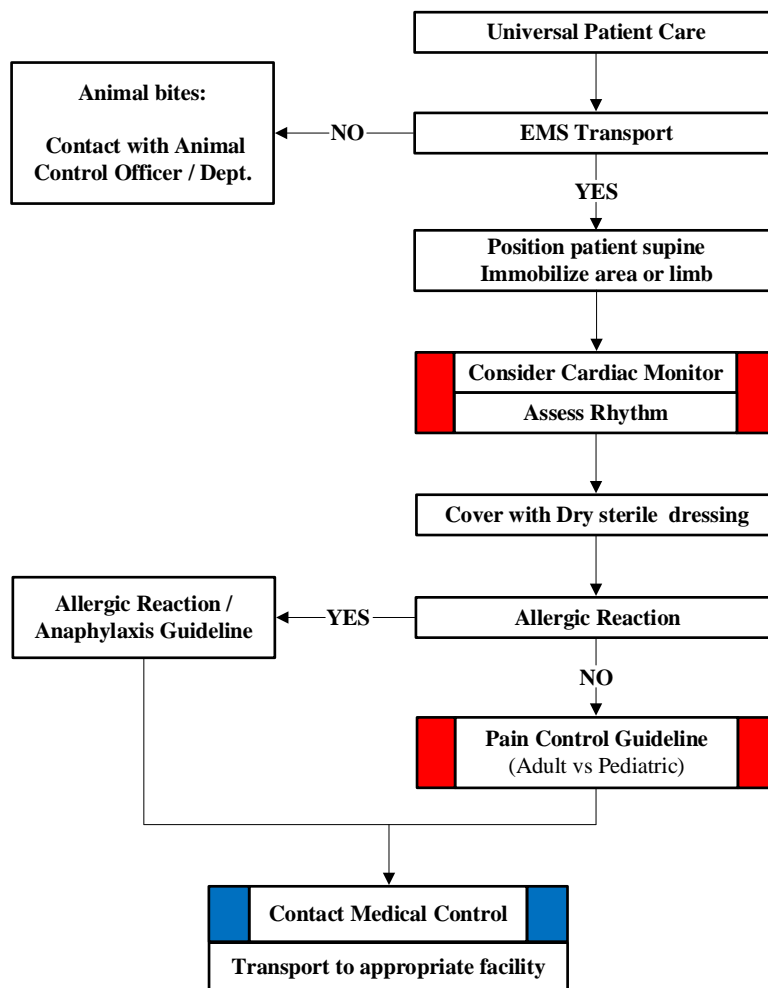
GUIDELINES



TAB 6 GUIDELINE 1

BITE AND ENVENOMATION

HISTORY	SIGNS / SYMPTOMS	DIFFERENTIAL
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Animal bite Human bite Snake bite (poisonous) Spider bite (poisonous) Insect sting / bite (bee, wasp, ant, tick) Infection risk Rabies risk Tetanus risk



LEGEND		
	EMT-P	
	Nurse	
	MC Order	

For bees / wasps:

- Remove stinger mechanism by scraping with a straight edge.
- Do not squeeze venom sac

For spiders:

- Bring in spider if captured or dead for identification

For Snakes:

- Remove patient from proximity to snake
- Remove all constricting items from bitten limb (e.g.: rings, jewelry, watch, etc.)
- Immobilize bitten part
- Do NOT use ice, refrigerants, tourniquets, scalpels or suction devices
- Mark margins of erythema and/or edema with pen or marker and include time measured

For Ticks

- Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible
- Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin.
- If this happens, remove the mouth-parts with tweezers
- If you are unable to remove the mouth easily with clean tweezers, leave it alone and seek medical assistance

SPECIAL CONSIDERATIONS:

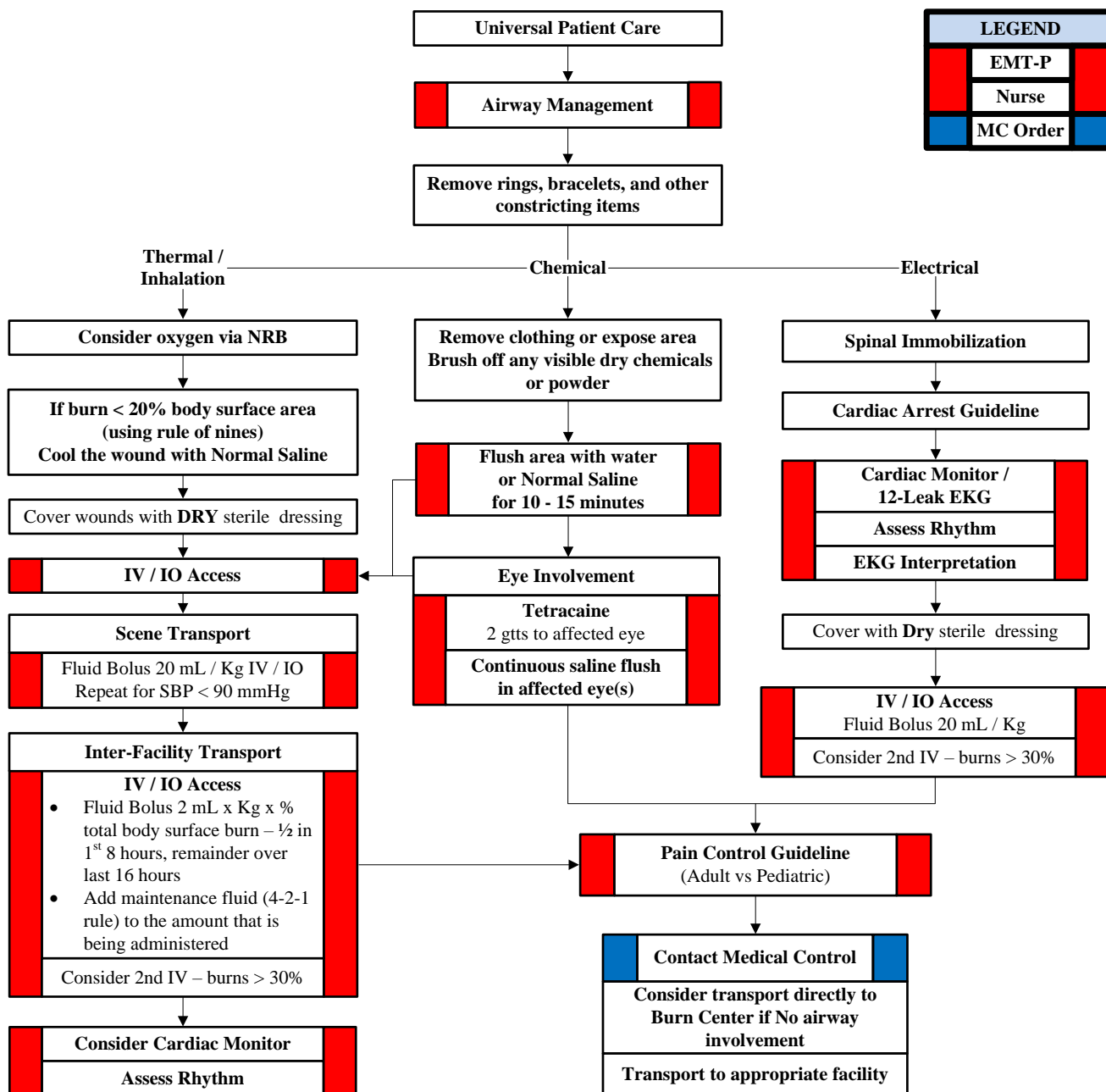
1. Bees / wasps
 - a. Remove stinger mechanism by scraping with a straight edge
 - b. Do not squeeze venom sac
2. Spiders
 - a. Only indigenous poisonous spider in Northwest Ohio is the black widow
 - b. Bring in spider if captured or dead for identification
3. Snakes
 - a. No indigenous poisonous snakes in Northwest Ohio
 - b. Treatment
 - i. Remove patient from proximity to snake
 - ii. Remove all constricting items from bitten limb (e.g.: rings, jewelry, watch, etc.)
 - iii. Immobilize bitten part
 - iv. Do NOT use ice, refrigerants, tourniquets, scalpels or suction devices
 - v. Mark margins of erythema and/or edema with pen or marker and include time measured
4. Ticks
 - a. Tick-borne diseases
 - i. Lyme Disease
 - ii. Rocky Mountain Spotted Fever
 - iii. Southern Tick Associated Rash Illness (STARI)
 - b. Removal
 - i. Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible
 - ii. Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin.
 1. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and seek medical assistance
 - iii. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water

Dispose of a live tick by submersing it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape, or flushing it down the toilet. Never crush a tick with your finger

TAB 6 GUIDELINE 2

BURN

HISTORY	SIGNS / SYMPTOMS	DIFFERENTIAL
<ul style="list-style-type: none"> Type of exposure (heat, gas, chemical) Inhalation injury Time of injury Past medical history Medications Other trauma Loss of consciousness Tetanus/Immunization status 	<ul style="list-style-type: none"> Burns, pain, swelling Dizziness Loss of consciousness Hypotension / shock Airway compromise / distress Singed facial or nasal hair Hoarseness / wheezing 	<ul style="list-style-type: none"> Superficial (1st degree) Partial thickness (2nd degree) Full thickness (3rd degree) Chemical Thermal Electrical Radiation



SPECIAL CONSIDERATIONS:

1. Critical Burns

a. Transfer to recognized Burn Center

<ul style="list-style-type: none">• > 20% body surface area (BSA) with age > 10.• > 10% BSA with age < 10.• 3rd degree burns > 5% BSA• 2nd and 3rd degree burns to face, eyes, hands or feet.	<ul style="list-style-type: none">• Electrical / Inhalation / Deep chemical burns• Burns with extremes of age or chronic disease• Burns associated with major traumatic injury.
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2. Thermal burns

- Leave blisters intact when possible.
- Suspect airway burns in any facial burns or burns received in closed / confined spaces. Edema may become severe, but not usually in the first hour. Avoid unnecessary trauma to the airway.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Assume carbon monoxide poisoning in all closed space burns.
- Utilization of modified Parkland Formula for fluid resuscitation**
 - 2 ml x wgt (in Kg) x % total body surface burn based on rule of nines or palmer surface area
 - When estimating only partial thickness (2nd degree) or full thickness (3rd degree) burns are used to calculate the total body surface burn.
 - If necessary, consider underestimating when using to calculate IV hydration
 - ½ of fluid is given over the first 8 hours with the remainder of the fluid given over 16 hours

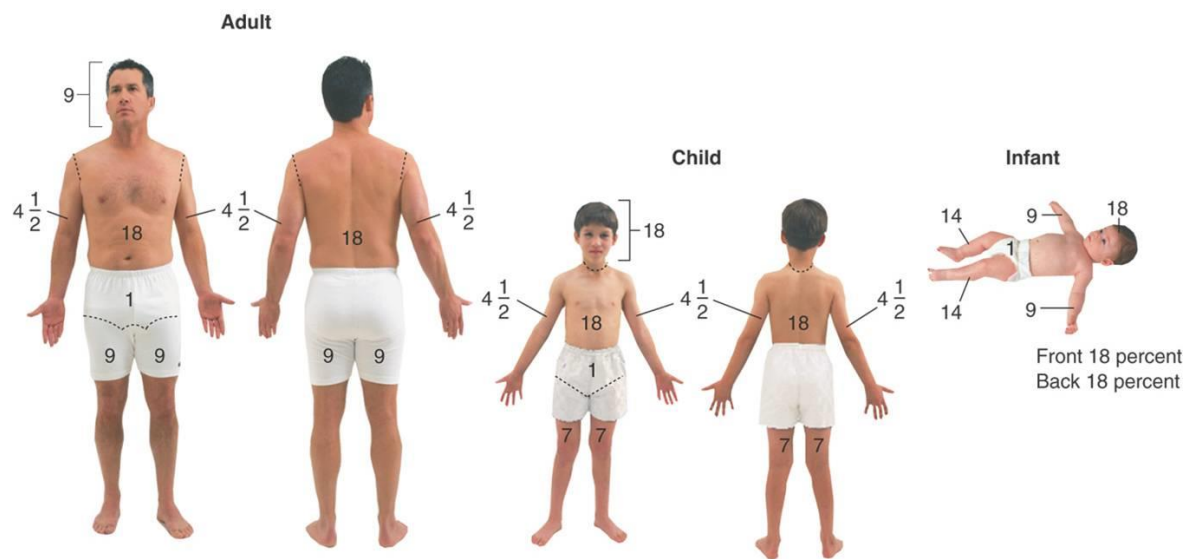
3. Common chemicals that cause burns

- Phenol** is a gelatinous caustic used as an industrial cleaner. It is difficult to remove because it is insoluble in water. Use alcohol, which may be found in areas where Phenol is regularly used, to dissolve the product. Follow removal with irrigation using large volumes of cool water
- Dry Lime** is a strong corrosive that reacts with water. It produces heat and subsequent chemical and thermal injuries. Brush dry lime off the patient gently, but as completely as possible. Then rinse the contaminated area with large volumes of cool to cold water

- c. **Sodium** is an unstable metal that reacts destructively with many substances, including human tissue and water. Decontaminate the patient quickly with gentle brushing. Then, cover the wound with oil used to store the substance
- d. **Riot Control Agents** (Mace, Pepper Spray, etc.) cause intense irritation of the eyes, mucous membranes, and respiratory tract. Treatment is supportive and most patients recover in 10 – 20 minutes of exposure to fresh air. If necessary, irrigate the patient's eyes with Normal Saline if you suspect the agent remains in the eyes
- e. **Hydrofluoric Acid** is a common corrosive that reacts with water. It produces heat and subsequent chemical and thermal injuries resulting in extreme pain to the affected areas. Cover the wound and avoid contact with water

4. Estimation of Total Body Surface Burns

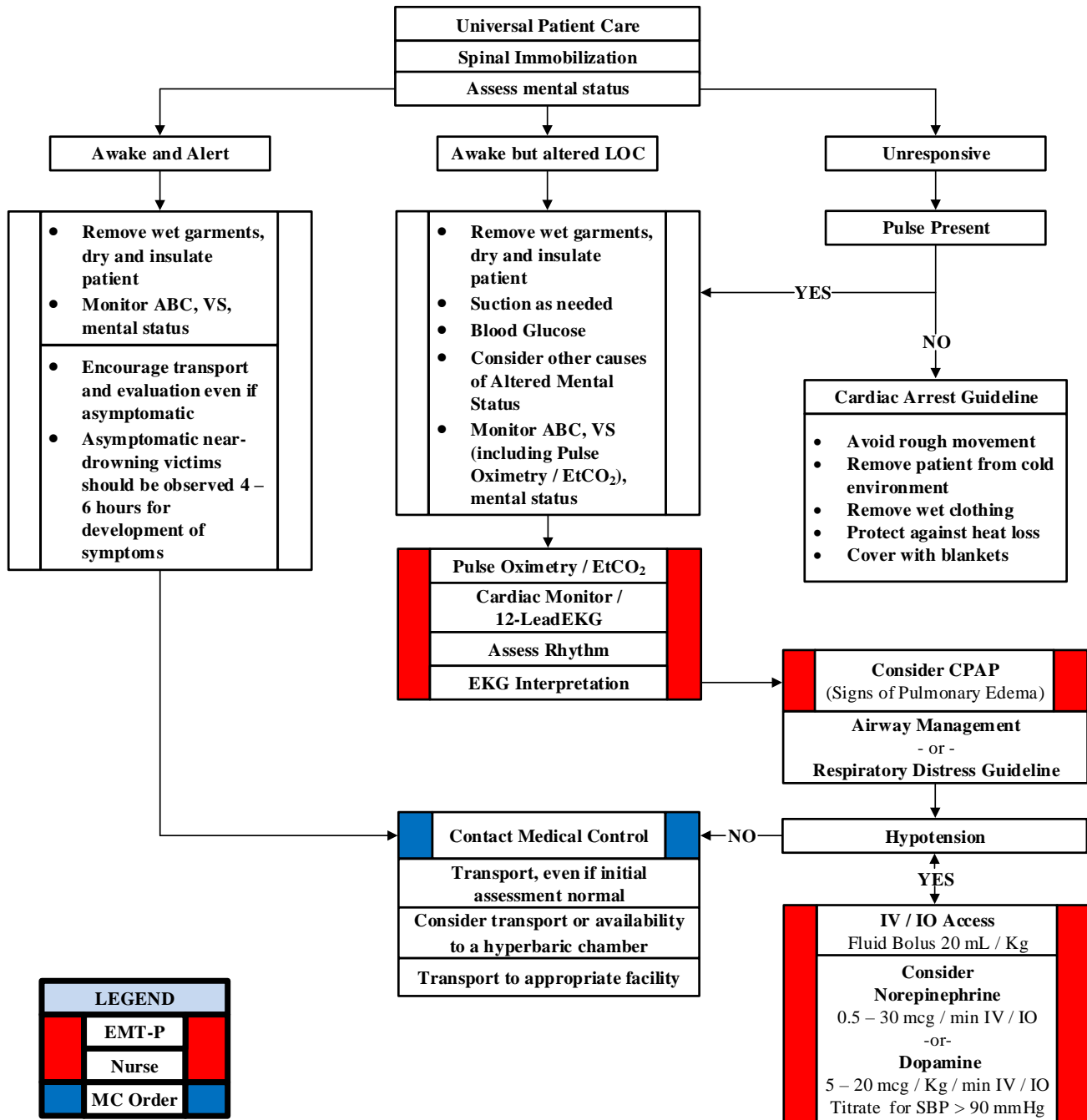
- a. Estimation in the prehospital setting for burns can be difficult at times.
- b. Palmer Surface Method
 - i. Using size of patient's palm will estimate approximately 1%
- c. RULE OF NINES



Note: Each arm totals 9 percent (front of arm $4\frac{1}{2}$ percent, back of arm $4\frac{1}{2}$ percent)

TAB 6 GUIDELINE 3
DROWNING AND NEAR DROWNING

HISTORY	SIGNS / SYMPTOMS	DIFFERENTIAL
<ul style="list-style-type: none"> • Submersion in water regardless of depth • Possible history of trauma (i.e., diving board) • Duration of immersion • Temperature of water • Fresh / Salt water • Degree of Contamination of water 	<ul style="list-style-type: none"> • Unresponsive • Mental status changes • Decreased or absent vital signs • Vomiting • Coughing 	<ul style="list-style-type: none"> • Trauma • Pre-existing medical problem • Pressure injury (diving) • Barotrauma • Decompression sickness



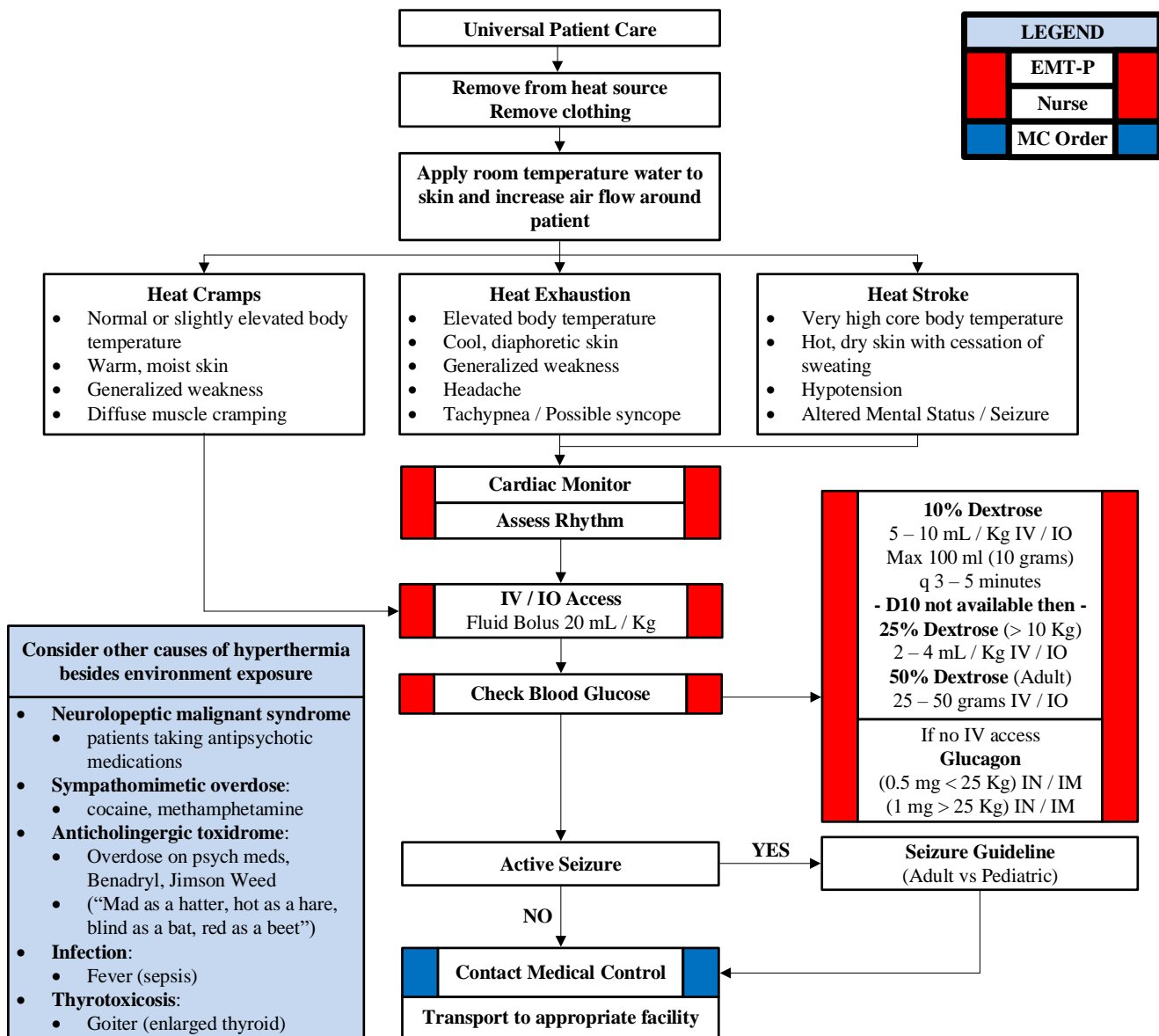
SPECIAL CONSIDERATIONS:

1. Pulse and respirations may be very slow and difficult to detect if patient is severely hypothermic.
 - a. If no definite pulse, and no signs of life, begin CPR.
 - b. If not breathing, start rescue breathing.
2. Drowning / submersion commonly associated with hypothermia.
 - a. Patients should not be pronounced dead until rewarmed in hospital.
3. Profound bradycardias may be evident in setting of severe hypothermia and decreased O₂.
4. Patients with drowning or near-drowning should be encouraged to go to the hospital for continued monitoring and evaluation for 4 – 6 hours after event.

TAB 6 GUIDELINE 4

HYPERTHERMIA

HISTORY	SIGNS / SYMPTOMS	DIFFERENTIAL
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Altered mental status or unconsciousness Hot, dry or sweaty skin Hypotension or shock Seizures Nausea 	<ul style="list-style-type: none"> Fever (Infection) Dehydration Medications Hyperthyroidism (Storm) Delirium tremens (DT's) Heat cramps Heat exhaustion Heat stroke CNS lesions or tumors



LEGEND	
	EMT-P
	Nurse
	MC Order

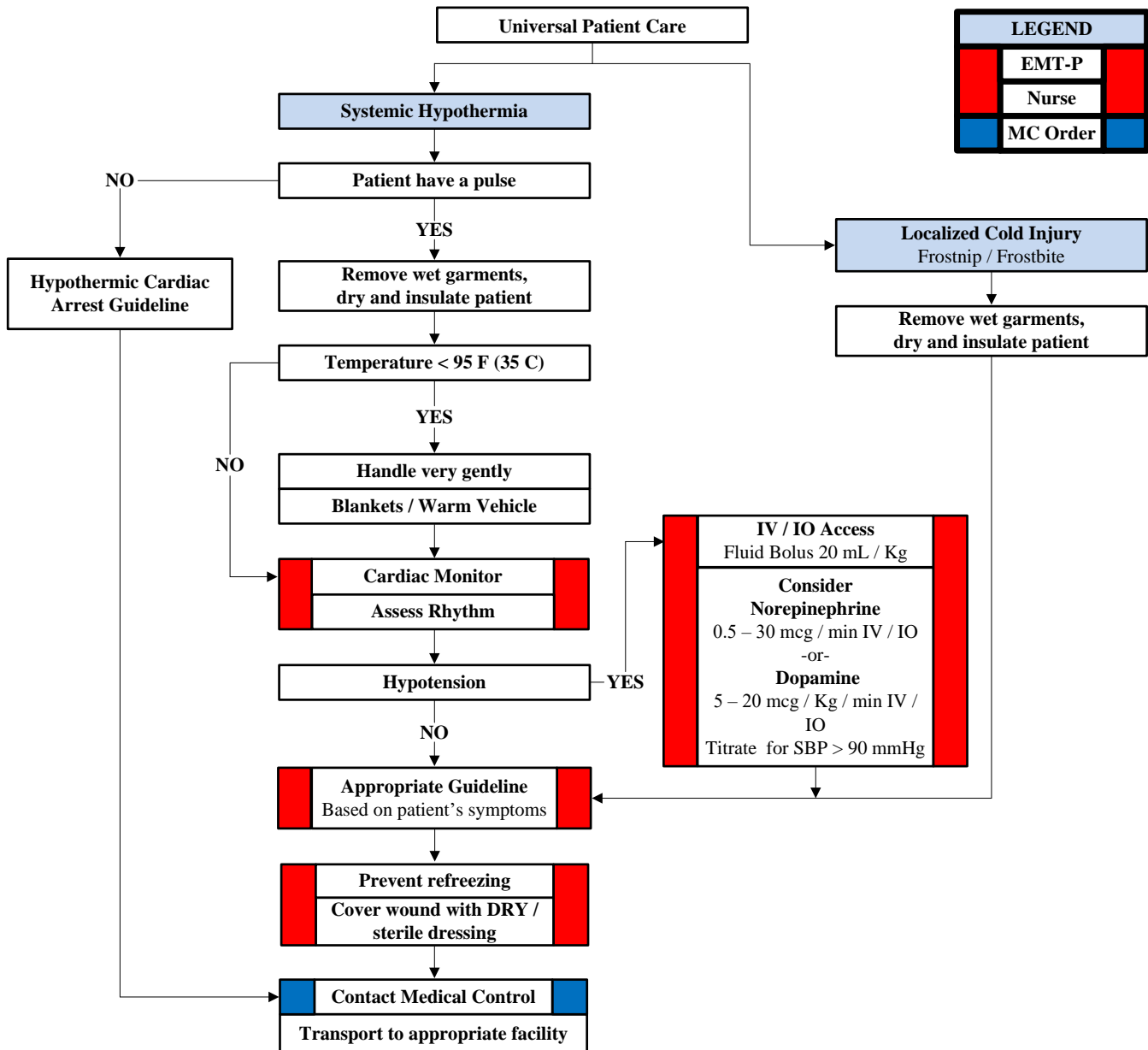
SPECIAL CONSIDERATIONS:

1. Heat stroke is a medical emergency. It is distinguished by altered level of consciousness. Sweating may still be present, especially in exercise-induced heat stroke. The other persons at risk for heat stroke are the elderly and person on medications, which impair the body's ability to regulate heat.
 - a. The bodies "sweating" mechanism generally disappears as body temperature rises above 104°F (40°C). Intense shivering may occur as the patient is cooled.
2. 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.
3. Initial cooling measures for heat exhaustion / stroke can be accomplished by applying cold packs (palms of hands, soles of feet, neck, axilla, and groin) or water-soaked sheets. Ensure adequate airflow over patient for evaporative loss. Definitive cooling requires ice water baths and careful monitoring. **DO NOT LET COOLING IN THE FIELD DELAY YOUR TRANSPORT.** Cool patient as much as possible while transporting to the hospital. Care should be taken not to make the patient become hypothermic.
4. 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.

TAB 6 GUIDELINE 5

HYPOTHERMIA | FROSTBITE

HISTORY	SIGNS / SYMPTOMS	DIFFERENTIAL
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Cold, clammy Shivering Mental status changes Extremity pain or sensory abnormality Bradycardia Hypotension or shock 	<ul style="list-style-type: none"> Sepsis Environmental exposure Hypoglycemia CNS dysfunction <ul style="list-style-type: none"> Stroke Head injury Spinal cord injury



SPECIAL CONSIDERATIONS:

1. Hypothermia

- a. Core body temperature < 35°C (95°F).
- b. Shivering does not occur below 90 °F (patient temperature). Below this the patient may not even feel cold.
- c. The heart is most likely to fibrillate below 85 – 88 °F (30 °C). Defibrillation should be attempted, but prolonged CPR may be necessary until the temperature is above this level.
 - i. Any handling and airway manipulation may induce ventricular fibrillation in the hypothermic patient. Delay intubation if airway can be managed by less invasive means.
- d. ALS drugs should be used sparingly since peripheral vasoconstriction may prevent entry into central circulation until temperature is resorted; at that time a large bolus of unwanted drugs may be infused into the heart. BRADYCARDIA is normal and should not be treated.
- e. If not shivering don't ambulate patient and / or avoid unnecessary external stimuli (jarring of stretcher, loud noise). This activity can cause fibrillation.
- f. If patient has even a faint pulse, organized monitor rhythm and occasional respirations, CPR is currently felt to be unnecessary. In general, even very slow rates are probably sufficient for metabolic demands. CPR is **indicated** for Asystole and Ventricular fibrillation, though the compression rate can be slower than usual (40 bpm).
- g. Patients who appear dead after prolonged exposure to cold air or water should not be pronounced "dead" until they have been rewarmed.

2. Frostbite

- a. Thawing is extremely painful and should be done under controlled conditions, preferably in the hospital. Careful monitoring, pain medication, prolonged rewarming and sterile handling are required.
- b. It is clear that partial rewarming, or rewarming followed by refreezing, is far more injurious to tissues than delay in rewarming or walking on a frozen extremity to reach help. Do not rewarm prematurely. Indications for field rewarming are almost nonexistent.
- c. Have patient avoid smoking or having caffeine.

TAB 6 GUIDELINE 6

HAZARDOUS MATERIAL (HAZMAT) | DECONTAMINATION

1. This guideline and our current training, resources and equipment are directed toward the chemical HAZMAT incident. Biological and nuclear / radiation events require an entirely different level of training, resources and equipment. A great difficulty with such events is simply the identification / recognition of such an event. Unfortunately, these patients may have already passed through the pre-hospital care services and into the hospital before recognition of an event has occurred. Subsequently, large amounts of resources, personnel and equipment may already be contaminated.
2. Priorities at Hazmat incident
 - a. Recognition – Recognizing the incident, dangers of the substance and need for isolation
 - b. Scene safe – Back up to 1000 ft upwind from incident
 - c. Identification – Begin identifying substances involved
 - d. Communication – Initiation of ICS and / or coordinated Hazmat response (per local FD guideline)
 - e. Isolation of area / event – Initiate / assist with isolation of area. This is to prevent further contamination of personnel and equipment, communicate with safety officers
 - f. Medical treatment – Knowledge and ability to reference treatment modalities for identified agent
3. Zones
 - a. HAZMAT incidents should have zones established by the HAZMAT teams. Listed below are these zones and their restrictions
 - i. Hot Zone (restricted area): This zone is only for personnel with appropriate protective clothing and appropriate training, typically EMS personnel do not enter this zone.
 - ii. Warm Zone: This zone is where decontamination occurs and also is a limited access area. This may be a large zone dependent on what material is involved.
 - iii. Cold Zone: This zone is also known as the clean zone. Transport lines would form in this zone. Incident command personnel and the rescue vehicles will be in this location
 - b. EMS units / personnel are **NOT** to enter incident beyond the cold zone.
4. Roles of the EMS provider
 - a. These roles may vary from department to department as training levels may vary (ie a paramedic who is a hazmat technician)

- b. To transport grossly decontaminated patients from the cold zone to an appropriate emergency facility
 - c. To provide medical care to patients / safety personnel in the cold zone including but not limited to triage
 - d. To monitor members of the HAZMAT team (rehab)
5. Equipment protection
- a. Whenever possible a front line vehicle **should not** transport patients to a medical facility due to the risk of contamination of the vehicle, its equipment and the medical facility receiving the patient
 - b. The EMS provider should use their portable supplies on the patient and not supplies from the front-line vehicle. Do not use the equipment (i.e. BP cuff) from the vehicle on a patient and then return it to the front line vehicle, as potential for cross contamination exists.
 - i. Portable equipment should remain in the zone it is used in until properly decontaminated.
 - ii. Patients transported should be wrapped in cotton sheets, to further reduce the risk of cross contamination to the vehicle and EMS providers
6. Decontamination
- a. **Clinical Indications:**
 - i. Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons
 - b. **Procedure:**
 - i. In coordination with HazMAT and other Emergency Management personnel, establish hot, warm and cold zones of operation and ensure that personnel assigned to operate within each zone have proper personal protective equipment
 - ii. In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
 - 1. Removal of patients from Hot Zone
 - 2. Simple removal of clothing
 - 3. Irrigation of eyes
 - 4. Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids.

- a. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s)
- iii. Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination
- iv. Assist patients with technical decontamination (unless contraindicated based on #3 above).
 - 1. This may include removal of all clothing and gentle cleansing with soap and water
 - 2. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided
 - 3. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids
- v. Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel effects for law enforcement.
- vi. Monitor all patients for environmental illness
- vii. Transport patients per local guideline

7. Hospitals

- a. Medical facilities should expect that the patients transported to their facility will have had gross decontamination performed by the on-scene Hazardous Materials Team. Gross decontamination means an attempt has been made to remove the majority of the agent the patient was exposed to by washing with soap and water. No assumption should be made that the **entire** agent has been removed

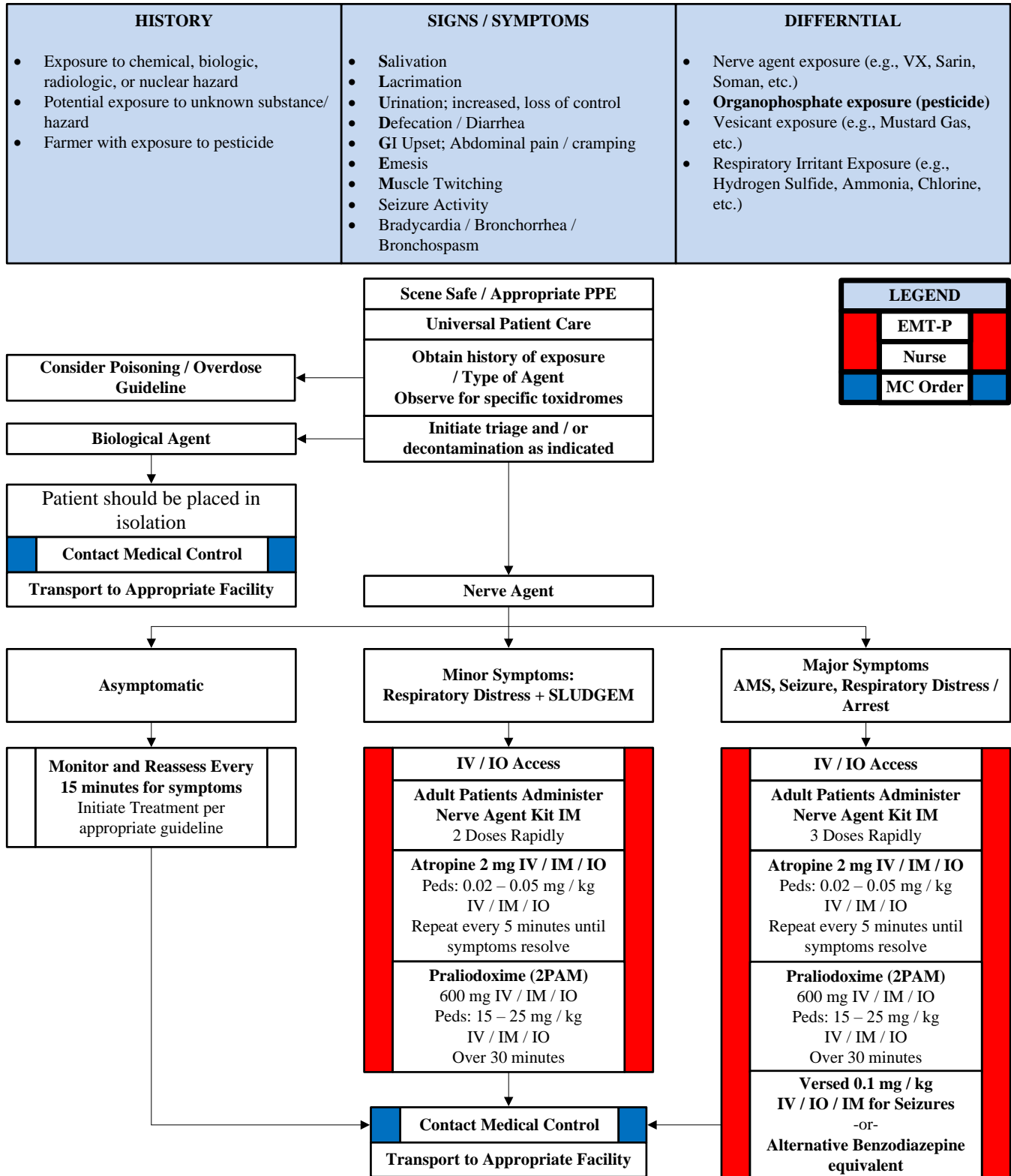
8. Agents

- a. If a scene is a suspected Weapons of Mass Destruction chemical event, the rescue vehicle paramedics will not approach patients until they are decontaminated
- b. Treatment shall be based on history and physical exam and does not require confirmation of the agent. Treat the patient's symptoms

9. **Patients contaminated with chemical / biological agent should not be placed into the EMS vehicle until proper gross and fine decontamination has occurred**

TAB 6 GUIDELINE 7

NERVE | BIOLOGIC AGENTS



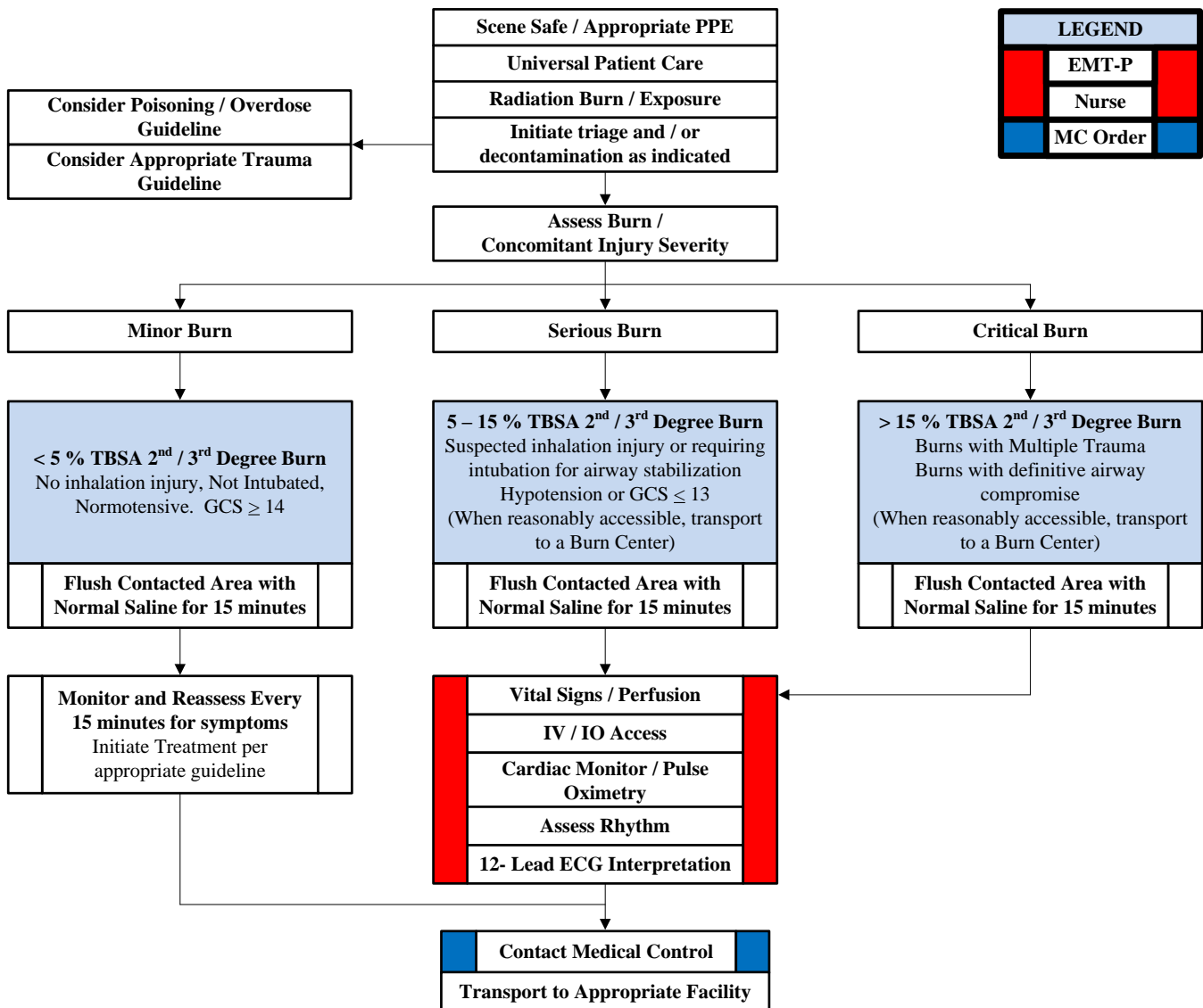
SPECIAL CONSIDERATIONS:

1. Biological agents
 - a. Patient should be placed in isolation
 - b. Respiratory issues treat per airway guideline
2. Nerve agents
 - a. **A first responder, EMT, advanced EMT, or Paramedic, may administer drugs or dangerous drugs contained within a nerve agent antidote auto-injector kit, including a Duodote or MARK I kit, in response to suspected or known exposure to a nerve or organophosphate agent provided the first responder or EMT is under physician medical direction and has received appropriate training**
 - b. If cyanide suspected, follow Poisoning | Overdose | Toxic Ingestion Guideline
 - c. There are no specific antidotes for blister agents

TAB 6 GUIDELINE 8

RADIATION INCIDENT

HISTORY	SIGNS / SYMPTOMS	DIFFERENTIAL
<ul style="list-style-type: none"> Type of exposure (heat, gas, chemical) Inhalation injury Time of Injury Past medical history / Medications Other trauma Loss of Consciousness Tetanus / Immunization status 	<ul style="list-style-type: none"> Burns, pain, swelling Dizziness Loss of consciousness Hypotension / shock Airway compromise / distress could be indicated by hoarseness / wheezing / Hypotension 	<ul style="list-style-type: none"> Superficial (1st Degree) red - painful (Don't include in TBSA) Partial Thickness (2nd Degree) blistering Full Thickness (3rd Degree) painless/ charred or leathery skin Thermal injury Chemical – Electrical injury Radiation injury Blast injury



SPECIAL CONSIDERATIONS:

- **Three methods of exposure:**
 - External irradiation
 - External contamination
 - Internal contamination
- **Two classes of radiation:**
 - Ionizing radiation (greater energy) is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays
 - Non-ionizing (lower energy) examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem)
- Patients experiencing radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination
- **The three primary methods of protection from radiation sources:**
 - Limiting time of exposure
 - Distance from
 - Shielding from the source
- **Decontamination of patient with external radiation contamination is best with baby wipes and use of Geiger counter. Ensure that proper radiation protection for those decontaminating**
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes Nausea / Vomiting, hypothermia/hyperthermia, diarrhea, neurological / cognitive deficits, headache and hypotension