

DENVER METROPOLITAN EMS PROTOCOLS UPDATE: 2011

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**FOR THE DENVER METRO EMS MEDICAL
DIRECTORS**

OVERVIEW

- Introduction to the new format and features
- Highlight major concepts/changes
- Review numerous miscellaneous changes and additions
- If possible, follow along with electronic document during this presentation

GENERAL GUIDELINES: INTRODUCTION

INTRODUCTION

The following protocols have been developed and approved by the Denver Metro EMS Medical Directors (DMEMMSD) group. These protocols define the standard of care for EMS providers in the Denver Metropolitan area, and delineate the expected practice, actions, and procedures to be followed.

No protocol can account for every clinical scenario encountered, and the DMEMMSD recognize that in rare circumstances deviation from these protocols may be necessary and in a patient's best interest. Variance from protocol should always be done with the patient's best interest in mind and backed by documented clinical reasoning and judgment. Whenever possible, prior approval by direct verbal order from base station physician is preferred. Additionally, all variance from protocol should be documented and submitted for review by agency Medical Director in a timely fashion.

The protocols have a new look and are presented in an algorithm format. An algorithm is intended to reflect real-life decision points visually. An algorithm has certain limitations, and not every clinical scenario can be represented. Although the algorithm implies a specific sequence of actions, it may often be necessary to provide care out of sequence from that described in the algorithm if dictated by clinical needs. An algorithm provides decision-making support, but need not be rigidly adhered to and is no substitute for sound clinical judgment.

In order to keep protocols as uncluttered as possible, and to limit inconsistencies, individual drug dosing has not been included in the algorithms. It is expected the EMTs will be familiar with standard drug doses. Drug dosages are included with the medications section of the protocols as a reference.

If viewing protocol in an electronic version, it will be possible to link directly to a referenced protocol by clicking on the hyperlink, which is underlined.

PROTOCOL KEY

Boxes without any color fill describe actions applicable to all levels of EMT. Boxes with orange fill are for actions for EMT-intermediate level or higher, and blue-filled boxes are for EMT-paramedic level. When applicable, actions requiring base contact are identified in the protocol.

EMT	EMT-I	Paramedic
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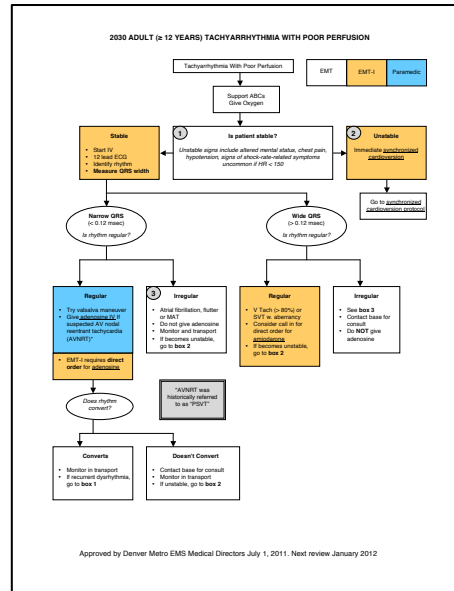
Teaching points deemed sufficiently important to be included in the protocol are separated into grey-filled boxes with a double line border:

- Teaching points

PEDIATRIC PROTOCOLS

For the purposes of these clinical care protocols, pediatric patients are those < 12 years of age, except where identified in a specific protocol.

Approved by Denver Metro EMS Medical Directors July 1, 2011. Next review January 2012



7010 MEDICATIONS

NALOXONE (NARCAN)

Description

Naloxone is a competitive opioid receptor antagonist

Onset & Duration

Onset: Within 5 minutes
Duration: 1-4 hours

Indications

- For reversal of suspected opioid-induced CNS and respiratory depression
- Cause of unknown origin
- Seizure of unknown etiology (rule out narcotic overdose, specifically propoxyphene)

Adverse Reactions

- Tachycardia
- Nausea and vomiting
- Pulmonary Edema

Dosage and Administration

Adults:
0.4 mg IV/IO/IM/N and titrate to desired effect, up to 2 mg total
In cases of severe respiratory compromise or arrest, 2 mg bolus IV/IO/IM is appropriate, otherwise drug should be titrated

Pediatrics:
0.4 mg IV/IO/IM/N and titrate to desired effect, up to 2 mg total

Protocol

- Universal Allergy/Mental Status Protocol
- Pain/Anxiety/Overdose

Special Considerations

- Patients receiving naloxone must be transported to a hospital
- Narcotic-dependent patients may experience violent withdrawal symptoms. Before administering naloxone to a suspected opioid overdose, consider if supportive care alone may be adequate.

Approved by Denver Metro EMS Medical Directors July 1, 2011. Next review January 2012

ALGORITHM FORMAT

- **The biggest change in this document**
- **An algorithm is intended to reflect real-life decision points visually**
- **Although the algorithm implies a specific sequence of actions, it may often be necessary to provide care out of sequence from that described in the algorithm if dictated by clinical needs**
- **An algorithm provides decision-making support, but need not be rigidly adhered to and is no substitute for sound clinical judgment**

HYPERLINKS

- Where another existing protocol or medication is referenced in the protocol, a hyperlink has been created
- By clicking on an underlined word, or hyperlink, within the PDF document, you will jump to that protocol. You may jump back to prior protocol by selecting its hyperlink from within the viewed protocol
- For example, from the Pediatric Universal Respiratory Distress Algorithm, you can jump to the Racemic Epinephrine medication protocol, and then back to the original algorithm by selecting it
- For this reason, greatest functionality of document is in electronic format

DRUG DOSAGES

- **In order to keep protocols as uncluttered as possible, and to limit inconsistencies, individual drug dosing has not been included in the algorithms**
- **It is expected the EMS personnel will be familiar with standard drug doses**
- **Drug dosages are included in the medications section of the protocols as a reference**

PEDIATRIC AGE

- **For the purposes of the Denver Metro EMS Protocols, “pediatric” refers to patients less than 12 years of age**
- **This distinction is consistent with ACLS/PALS, and is for the purposes of clinical treatment protocols and does not replace other pediatric age definitions. For example the RETAC Trauma Triage Algorithms, which are for the purpose of destination decision-making, may use different age definitions of pediatric patients**

COLOR KEY

EMT

EMT-Intermediate

Paramedic

Teaching Points

- **Boxes with no fill refer to acts allowed by all levels, including EMT**
- **Yellow boxes refer to acts allowed by EMT-I and up**
- **Blue shaded boxes refer to acts allowed by Paramedics only**
- **Grey boxes with double line are for “teaching points”**
- **For 2012, Advanced EMT will be added**

PROTOCOL REVISION PROCESS

- **Changes will be made to protocol no more frequently than every 6 months, except on an emergency basis**
- **A new version of the Denver Metro Protocols will be released every 6 months, and each version may be identified by the date on the footer of every page**
 - “Approved by Denver Metro EMS Medical Directors July 1, 2011. Next review January 2012 “
- **Suggested additions or changes should be made to agency Medical Director for review at Denver Metro EMS Medical Directors Meeting**

HIGHLIGHTED CHANGES: PEDIATRIC AIRWAY

Pediatric airway management:

- Based on studies of prehospital pediatric airway management, endotracheal intubation (ETI) of children has been shown to be no better than bag valve mask ventilation (BVM), and possibly associated with worse clinical outcomes¹.
- The Denver Metro EMS Medical Directors' position is:
 - Bag valve mask is preferred method of ventilation for children age < 12 years
 - ETI of children should be reserved for the extremely rare case where oxygenation and ventilation cannot be achieved by less invasive means, e.g. BVM
 - **Alternative:** an age and size-appropriate supraglottic airway (e.g. King Airway) may be used for patients age ≥ 8 years, if available (this currently requires waiver)

1. Gausche M, Lewis RJ, Stratton SJ, et al. **Effect of out-of-hospital pediatric endotracheal intubation on survival and neurological outcome: a controlled clinical trial.** *JAMA.* 2000;283:783–790

CASE

- **2 year old male with history of severe developmental delay and congenital heart disease is found pulseless and apneic by caregivers in his crib**
- **Last seen well > 6 hours ago**
- **Exam: pulseless, apneic, cyanotic**
- **Questions:**
 - *How should airway management and resuscitation proceed?*
- **Related protocols: 6010, 6015, 6030**

HIGHLIGHTED CHANGES: SEIZURES

Seizure management, adult and pediatric patients:

- Addition of intranasal **midazolam** (Versed) as potential first line drug for BOTH adults and pediatrics
- No more rectal **diazepam** (Valium)
- Use intranasal **midazolam** as first line in children and consider as first line in adults if IV access difficult or would delay treatment of status epilepticus
 - Note, **midazolam** may be supplied in either ampules which allow MAD to be directly attached, or in a vial which requires medication to be first drawn up into leuer lock syringe and MAD attached
- **IM midazolam** remains an option if no IV access, but **IN** preferred as no risk of needle stick
- **IV midazolam** is an option for 1st line treatment in adults and is preferred route for 2nd doses in adults and children

HIGHLIGHTED CHANGES: VENTILATION IN ADULT PULSELESS ARREST

- In adult pulseless arrest, unless arrest witnessed by EMS, perform 2 minutes of uninterrupted chest compressions and place oral airway and provide oxygen *passively* via non-rebreather facemask (NRB)
- After rhythm check, if non-shockable rhythm, begin bag-valve-mask (BVM) ventilations
- If shockable rhythm, continue passive oxygenation until 2nd rhythm check
- If suspected non-cardiac cause of arrest (e.g. drowning, asphyxia, trauma) begin BVM ventilations immediately in resuscitation sequence
- This change is supported by research showing improved neuro survival in victims of cardiac arrest who received passive oxygenation only₁

1. Bobrow et al. Passive Oxygen Insufflation Is Superior to Bag-Valve-Mask Ventilation for Witnessed Ventricular Fibrillation Out-of-Hospital Cardiac Arrest. *Ann Emerg Med* . 209'54:656-662

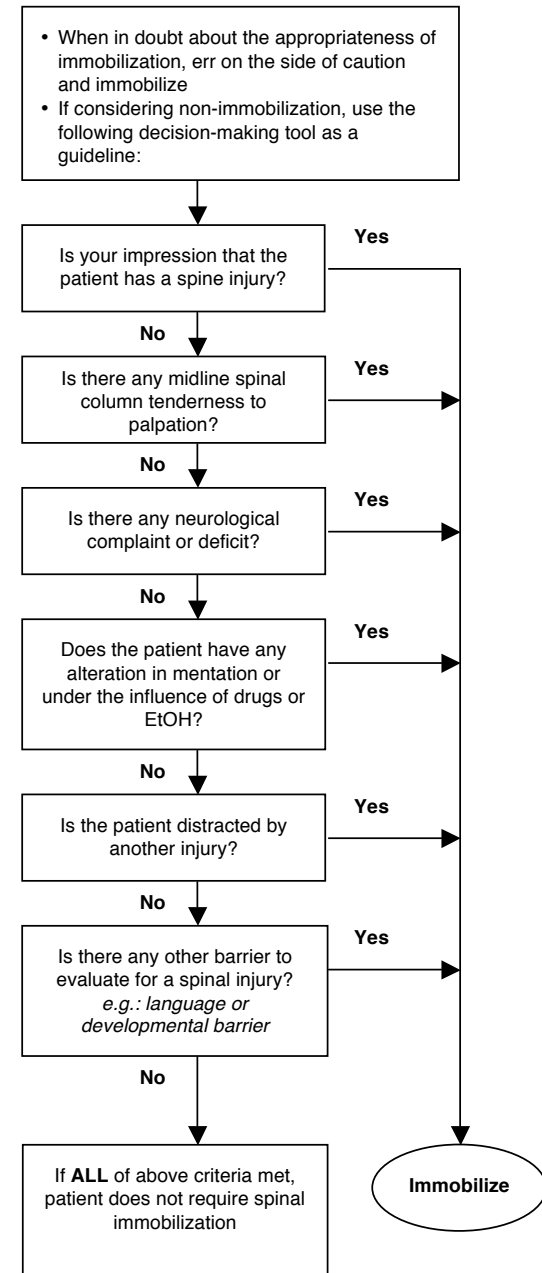
HIGHLIGHTED CHANGES: SELECTIVE SPINAL IMMOBILIZATION IN ADULTS

- **Multiple studies have proved safety of selective imaging of patients at very low risk for spinal injury_{1,2}**
- **Spinal immobilization benefits very few patients, is painful, costly, increases imaging in ED and may prolong or complicate transport in multiple ways₃**
- **Recommendation to *selectively* perform prehospital spinal immobilization based on proven safety and efficacy_{4,5}**

1. Hoffman JR, Wolfson AB, Todd K, et al. Selective cervical spine radiography in blunt trauma: methodology of the National Emergency X-Radiography Utilization Study (NEXUS). *Ann Emerg Med.* 1998;32:461-469
2. Stiell IG, Wells GA, Vandemheen KL, et al. The Canadian C-spine rule for radiography in alert and stable trauma patients. *JAMA.* 2001;286:1841-1848
3. Baez AA, Schiebel N. Is Routine Spinal Immobilization an Effective Intervention for Trauma Patients? *Ann Emerg Med* 2006; 47: 110-112
4. Stroh G, Braude D. Can an out-of-hospital cervical spine clearance protocol identify all patients with injuries? an argument for selective immobilization. *Ann Emerg Med.* 2001;37:609-615
5. Domeier RM, Frederiksen SM, Welch K. Prospective performance assessment of an out-of-hospital protocol for selective spine immobilization using clinical spine clearance criteria. *Ann Emerg Med.* 2005;46:123-131

HIGHLIGHTED CHANGES: SELECTIVE SPINAL IMMOBILIZATION IN ADULTS

- Goal is to identify patients unlikely to have spinal injury who do not benefit from immobilization
- If you think patient likely has spinal injury, then immobilize
- If patient is intoxicated, has distracting injury, abnormal neuro exam or mental status, or has tenderness to palpation AND has a mechanism for injury, then he or she should be immobilized
- Many agencies are already following a similar protocol with great success



SELECTIVE SPINAL IMMOBILIZATION: CASES

- **90 female trip and fall, facial hematoma and “burning” in arms but no neck pain**
 - Immobilize: not a normal neuro exam
- **30 female rear ended w. neck” tightness”, but no tenderness, normal neuro exam, no EtOH, no other injuries and ambulatory at scene**
 - Appropriate for non-immobilization as described
- **45 male, intoxicated, fell off barstool, large facial hematoma and slurred speech**
 - Immobilize. Abnormal mental status and intoxication

HIGHLIGHTED CHANGES: CARDIAC ALERT

New 2051 Cardiac Alert: Standardized Protocol for Denver Metro Area

- **Inclusion criteria:**
 - Symptoms compatible with ACS (chest pain, diaphoresis, dyspnea, etc.)
 - 12-lead ECG showing ST-segment elevation (STE) at least 1 mm in two or more anatomically contiguous leads
 - Age 35-85 years old (If STEMI patient outside age criteria, contact receiving hospital for consult)
- **Exclusion criteria:**
 - Wide complex QRS (paced rhythm, BBB, other)
 - Symptoms NOT suggestive of ACS (e.g.: asymptomatic patient)
 - If unsure if patient is appropriate for Cardiac Alert, discuss with receiving hospital MD

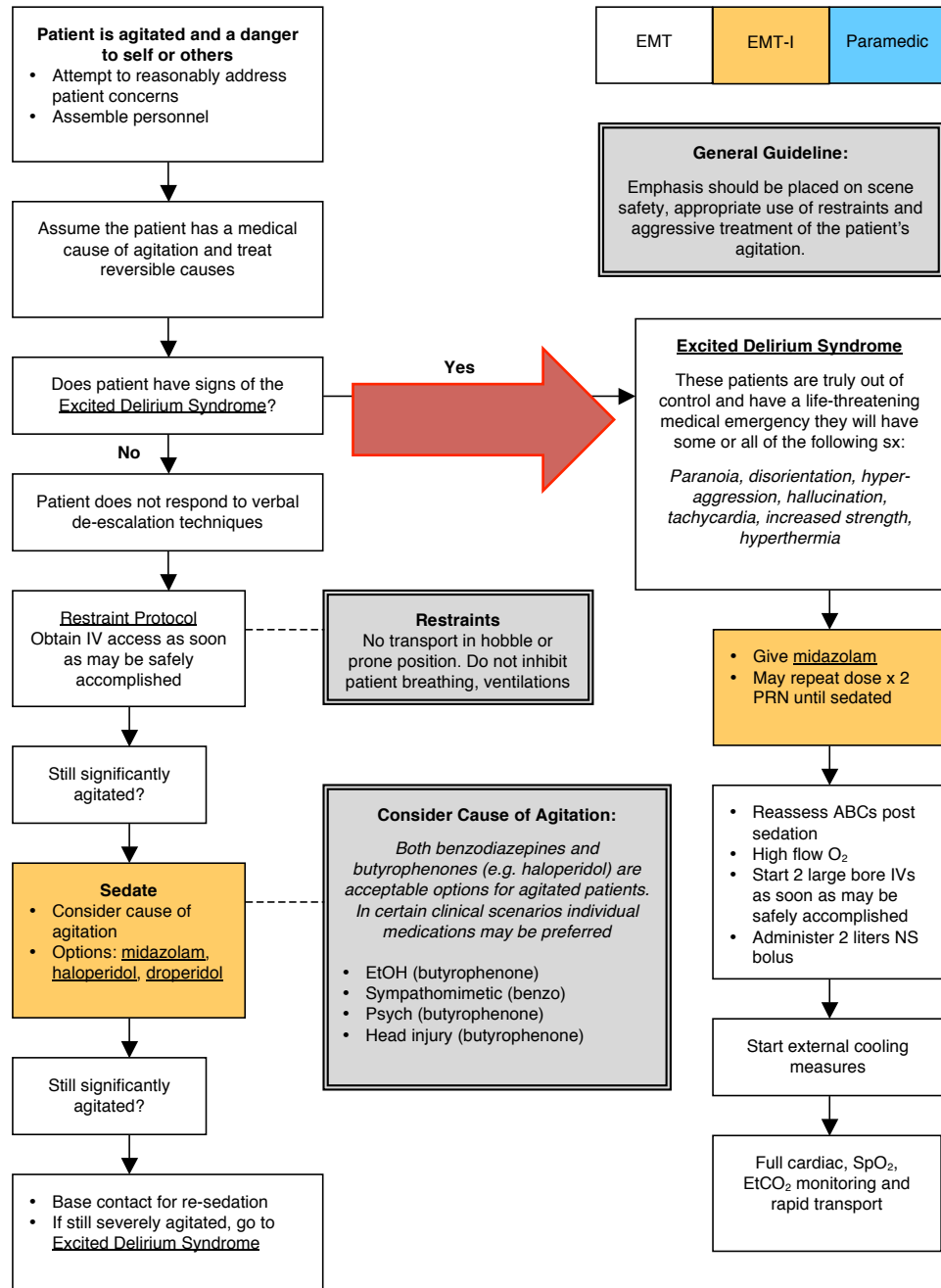
HIGHLIGHTED CHANGES: AGITATED/COMBATIVE PATIENTS

New 4075 Agitated/Combative Patient Protocol :

- **Excited Delirium recognized as a life-threatening condition warranting rapid medical treatment**
 - Distinguishes between routine and life-threatening agitated/combative states
 - Allows for standing order 3 doses midazolam if excited delirium
 - Initiate cooling measures for excited delirium
- **Term “chemical restraint” no longer preferred.**
- **Term “sedation” preferred for severely agitated, combative patients**
- **Related protocols: 4070, 4076, 0190**

4075 AGITATED/ COMBATIVE PATIENT PROTOCOL

Note Excited Delirium Syndrome



HIGHLIGHTED CHANGES: CALCIUM GLUCONATE

- **Calcium gluconate is back for paramedics**
- **Indications:**
 - Adult pulseless arrest associated with any of the following clinical conditions:
 - Known hyperkalemia
 - Renal failure with or without hemodialysis history
 - Calcium channel blocker overdose
 - **Not** indicated for routine treatment of pulseless arrest
 - Adult or pediatric calcium channel blocker overdose with hypotension, bradycardia
- **Related protocols: 4040 Overdose, 2020 Adult Pulseless Arrest**

HIGHLIGHTED CHANGES: CALCIUM GLUCONATE

Dosage and Administration

Adult:

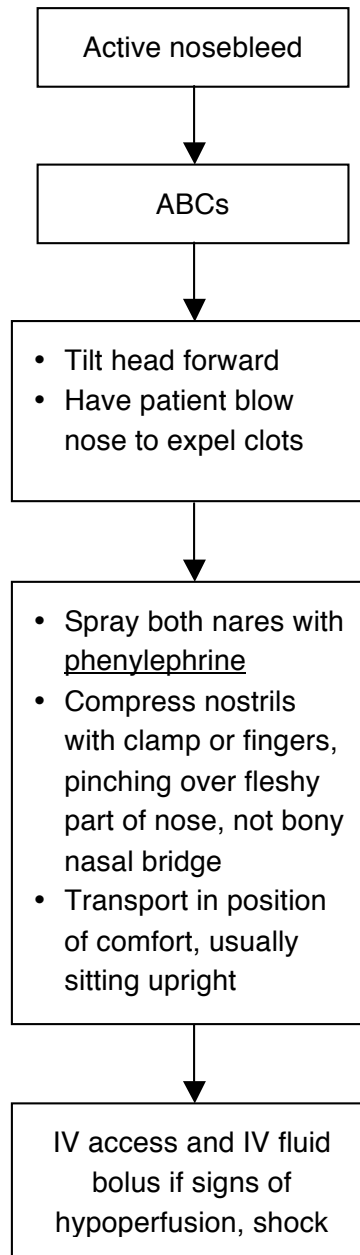
- **Pulseless arrest assumed due to hyperkalemia:**
 - 1 g slow IV push
- **Calcium channel blocker overdose:**
 - **Contact base** for order. 3 g slow IV/IO push over 2-3 minutes. Dose may be repeated every 10 minutes for total of 3 doses

Pediatric:

- **Calcium channel blocker overdose:**
 - **Contact Base.** 60 mg/kg (0.6 mL/kg), not to exceed 1 g slow IV/IO push, may repeat every 10 minutes for total of 3 doses

HIGHLIGHTED CHANGES: EPISTAXIS

New 0230 Epistaxis



EMT	EMT-I	Paramedic
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General Guidelines:

- Most nosebleeding is from an anterior source and may be easily controlled
- Avoid phenylephrine in pts with known CAD
- Anticoagulation with aspirin, clopidogrel (Plavix), warfarin (Coumadin) will make epistaxis much harder to control. Note if your patient is taking these or other anticoagulant medications
- Posterior epistaxis is a true emergency and may require advanced ED techniques such as balloon tamponade or interventional radiology. Do not delay transport. Be prepared for potential airway issues.
- Patients using nasal cannula oxygen may have cannula placed in mouth while nares are clamped or compressed for nosebleed

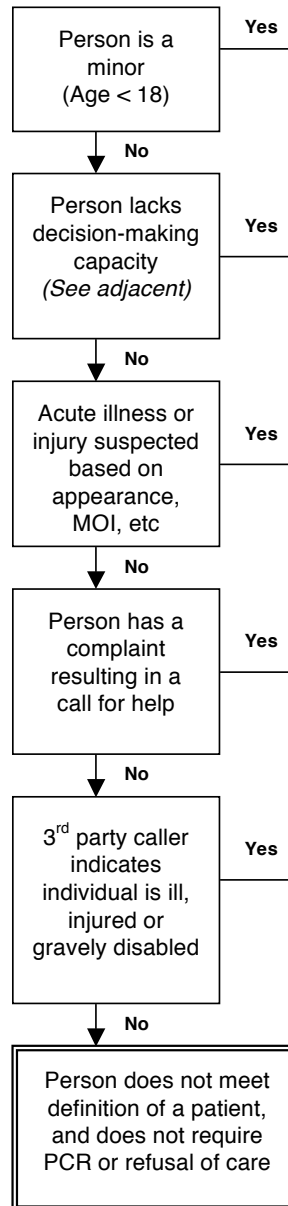
HIGHLIGHTED CHANGES: GENERAL GUIDELINES

New 0007 Patient Determination Protocol: “patient or not a patient”

- **Developed to assist with clarifying which contacts need to be documented as patients, as opposed to other forms of assistance not requiring patient care report (PCR)**
- **This will not likely change practice, but will act as a guideline for performance improvement and a reference for problematic cases reviewed**
- **It is expected that EMS personnel be familiar with the principles included therein**

“PATIENT OR NOT A PATIENT”

- Note definition of decision making capacity
- This is also the standard for determining who can refuse care
- This term is generally preferred to “competent”



General Guidelines

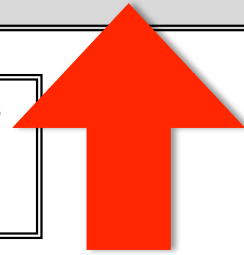
This protocol is intended to refer to individual patient contacts. In the event of a multiple party incident, such as a multi-vehicle collision, it is expected that a reasonable effort will be made to identify those parties with acute illness or injuries. Adult patients indicating that they do not wish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

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

Decision-Making Capacity
(Must meet all criteria)

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

Individual meets definition of a **Patient** (PCR Required)



HIGHLIGHTED CHANGES: TERMINATION OF RESUSCITATION (TOR)

Termination of resuscitation (TOR) Guideline

- **New protocol emphasizes more strongly the appropriateness of field pronouncement and TOR**
- **Note inclusion of MOST form: “Physician orders as specified on the Colorado Medical Orders for Scope of Treatment (MOST) form”**
- **Review specific field pronouncement guidelines for various medical and trauma scenarios**

HIGHLIGHTED CHANGES: TERMINATION OF RESUSCITATION (TOR)

- **Blunt Trauma Arrest:**
 - Contact Base for TOR if patient found apneic and pulseless and no response to BLS care including chest compressions and bag valve mask ventilations.
- **Penetrating Trauma Arrest:**
 - Resuscitate and transport to a trauma facility.
 - If time of arrest suspected to be > 10 minutes, and no signs of life or response to BLS care (as above), consider base contact for TOR.
- **Note that *neither* scenario requires patient be put on a cardiac monitor if above criteria met**
- **It is the position of the Denver Metro EMS Medical Directors that application of cardiac monitor in these scenarios not likely to identify salvageable patients**

HIGHLIGHTED CHANGES: TERMINATION OF RESUSCITATION (TOR)

Medical Pulseless Arrest:

- **Resuscitate according to Universal Pulseless Arrest Algorithm on scene (unless unsafe) until one of the following end-points met:**
 - Return of spontaneous circulation (ROSC).
 - No ROSC despite 15 minutes of provision of ALS care or BLS care with an AED. If shockable rhythm still present, continue resuscitation and transport to closest emergency department.
 - Contact base for TOR at any point if continuous asystole for at least 15 minutes in any patient despite adequate CPR with ventilation and no reversible causes have been identified.

HIGHLIGHTED CHANGES: TERMINATION OF RESUSCITATION (TOR)

- **For BLS-only providers, contact Base for TOR when all of the following criteria met:**
 - No AED shock advised
 - No ROSC
 - Arrest unwitnessed by either EMS or bystanders
 - No bystander CPR before EMS arrival
- **The following patients found pulseless and apneic warrant resuscitation efforts beyond 30 minutes and should be transported:**
 - Hypothermia and/or drowning with submersion < 60 minutes
 - Pregnant patient with estimated gestational age \geq 20 weeks

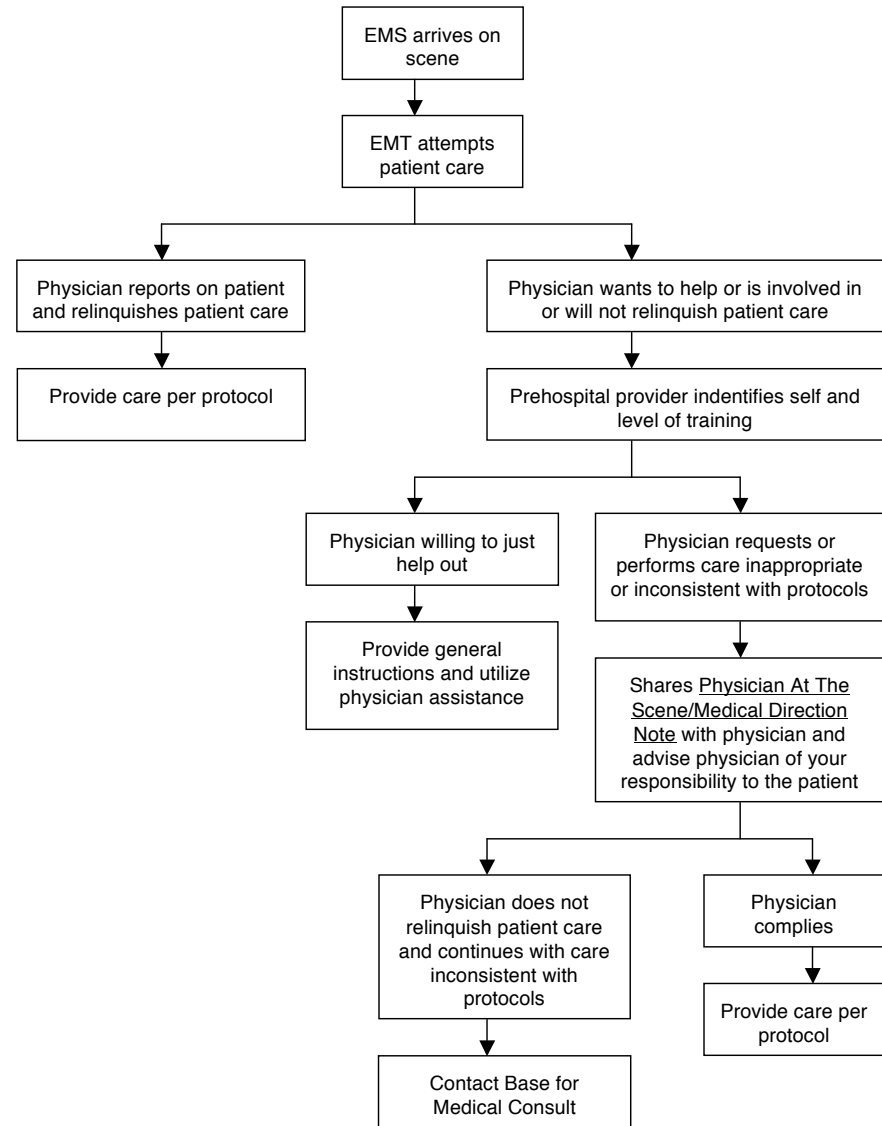
MISCELLANEOUS CHANGES: GENERAL GUIDELINES

“New” Physician on Scene

- **Actually a little-known preexisting protocol**
- **Includes printable form which may be given to physician on scene offering help**

GENERAL GUIDELINES: PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION ALGORITHM



MISCELLANEOUS CHANGES: PROCEDURES

- **0100 Oral intubation:**
 - Removal of cricoid pressure from protocol based on lack of effectiveness and possibility of making tube passage more difficult
 - “Backwards, upwards, rightward pressure” (BURP) is an optional maneuver for improving laryngeal view, and is NOT Selick’s maneuver
- **New 0150 Capnography:**
 - Review precautions section for teaching points
 - Continuous waveform capnography remains MANDATORY for all patients with advanced airways in place

MISCELLANEOUS CHANGES: PROCEDURES

- **0160 Synchronized cardioversion:**
 - Algorithm format. Standard doses (200 J biphasic for adults, 1-2 J/kg for children). Replacement of terms “PSVT” with more specific term “AV nodal reentrant tachycardia (AVNRT)
- **0180 Therapeutic Hypothermia:**
 - **Fentanyl** is now preferred to **midazolam** for treatment of shivering based on better evidence for its effectiveness
- **0190 Restraint:**
 - Note there are separate protocols for physical restraint and sedation of combative patients (4075)

MISCELLANEOUS CHANGES: PROCEDURES

New 0200 Tourniquet Protocol: All levels of certification

- **Indications:**
 - A tourniquet may be used to control potentially fatal hemorrhage only after other means of hemorrhage control have failed
 - A tourniquet applied incorrectly can increase blood loss.
- **Precautions:**
 - Applying a tourniquet can cause nerve and tissue damage whether applied correctly or not. Proper patient selection is of utmost importance. Injury due to tourniquet is unlikely if the tourniquet is removed within 1 hour. In cases of life-threatening bleeding benefit outweighs theoretical risk.
 - A commercially made tourniquet is the preferred tourniquet. If none is available, a blood pressure cuff inflated to a pressure sufficient to stop bleeding is an acceptable alternative. Other improvised tourniquets are not allowed

MISCELLANEOUS CHANGES: PROCEDURES

New 0200 Tourniquet Protocol: All levels of certification

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

MISCELLANEOUS CHANGES: PROCEDURES

- **0210 Needle Decompression of tension pneumothorax:**
 - Now a **standing order** for EMT-I and Paramedic if all 3 indicators of tension PTX present:
 - Severe respiratory distress
 - Hypotension
 - Unilateral absent or decreased breath sounds
- **0220 Intraosseus Catheter Placement: See indications:**
 - Rescue or primary vascular access device (for EMT-I and Paramedics) when peripheral IV access not obtainable in a patient with critical illness defined as:
 - Cardiopulmonary arrest or impending arrest
 - Profound shock with severe hypotension and poor perfusion
 - **Utilization of IO access for all other patients requires base station contact**
 - **E.g.: Hypoglycemia with severe symptoms (e.g. unresponsive) and no venous access**
 - IO placement may be considered prior to peripheral IV attempts in critical patients without identifiable peripheral veins

MISCELLANEOUS CHANGES: MEDICAL

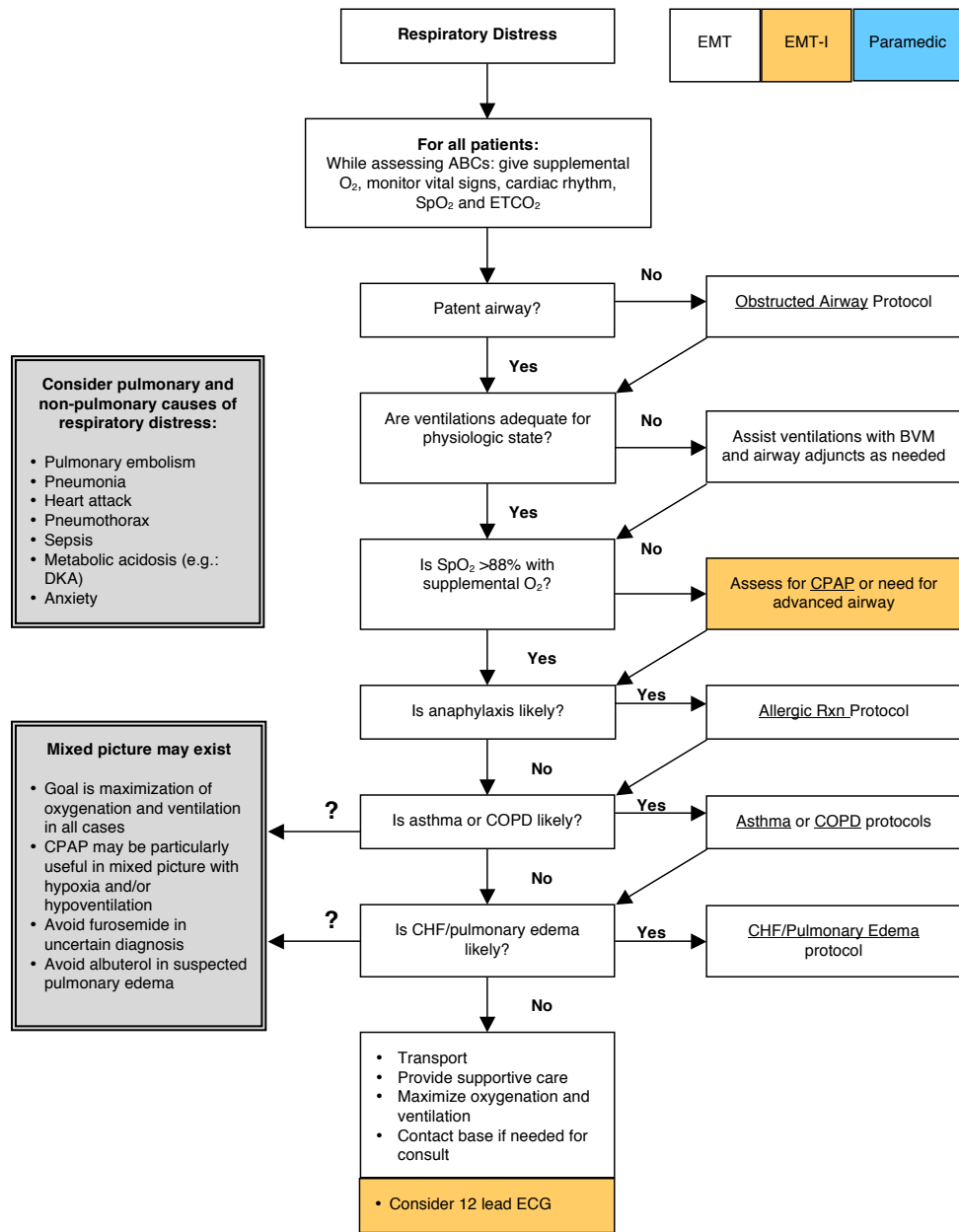
- **2030 Adult Tachycardia w. Poor Perfusion:**
 - Cardioversion for Paramedics only
 - EMT-I may give adenosine with a call in
- **2040 Adult Bradycardia w. Poor Perfusion:**
 - Inclusion of **dopamine** early if pacing for symptomatic bradycardia
 - This is consistent with ACLS. Rationale is that it is non-invasive, and increases myocardial contractility as well as heart rate and may increase mechanical capture. Also, it is simpler to use than epi and may be started before, or at the time of pacing
- **2050 Chest pain:**
 - **Fentanyl** is preferred opioid for chest pain

MISCELLANEOUS CHANGES: MEDICAL

- **Pulseless arrest, adult and pediatric patients:**
 - Change to single universal pulseless arrest algorithms as with ACLS/PALS
 - Changes in ventilation, airway management and addition of calcium for hyperK in adults already addressed
 - No atropine
 - Removal of **atropine** from pulseless arrest algorithm based on ACLS recommendations
 - No pacing
 - There is no role for pacing in pulseless arrest, which will only distract from adequate CPR. If a patient suffers asystolic arrest from an organized rhythm, the response should be ACLS care with compressions and epinephrine. If patient develops a pulse and remains severely bradycardic, then pacing may be considered.

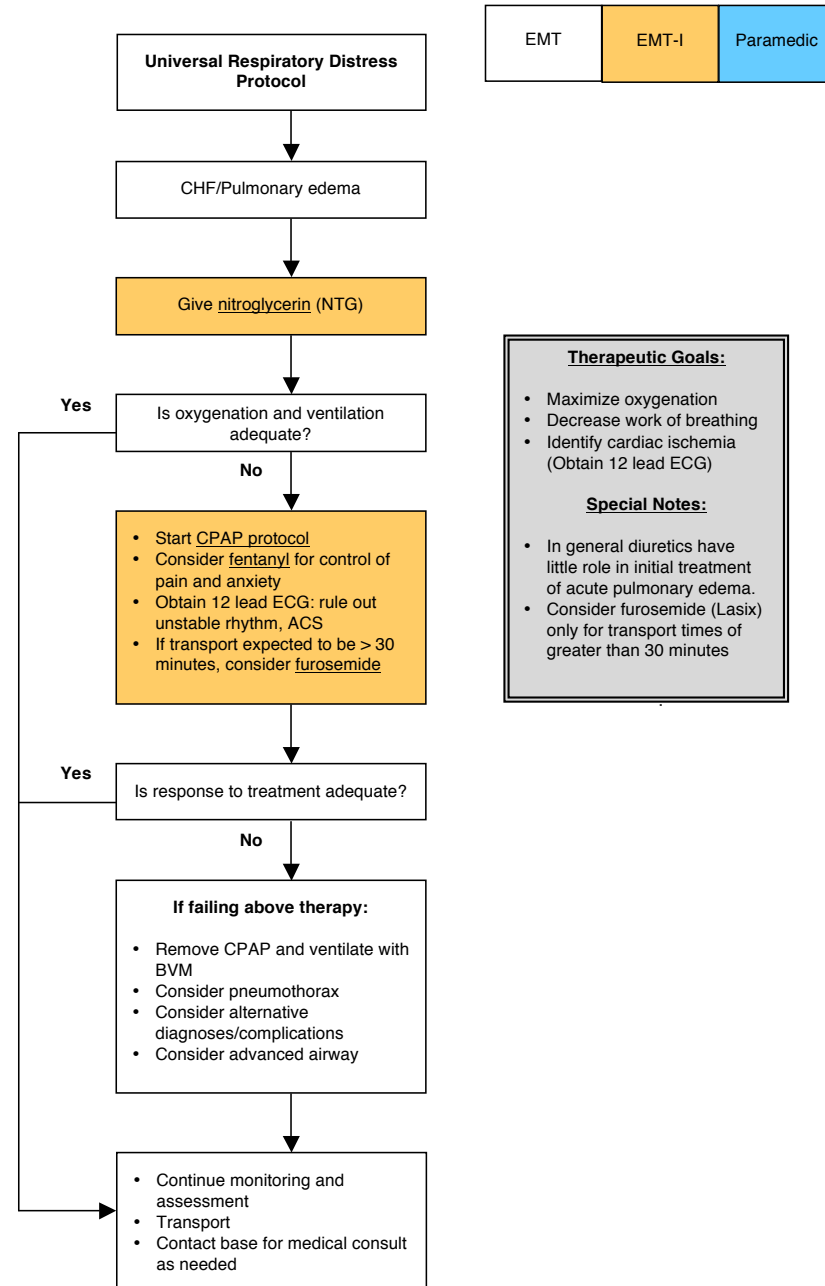
MISCELLANEOUS CHANGES: MEDICAL

- **New 3010 Universal Adult Respiratory Distress Algorithm**
 - Standardized, hierarchical approach to undifferentiated respiratory distress
 - Emphasizes mixed picture for many cases
 - Encourages early use of CPAP for appropriate patients, regardless of cause of symptoms



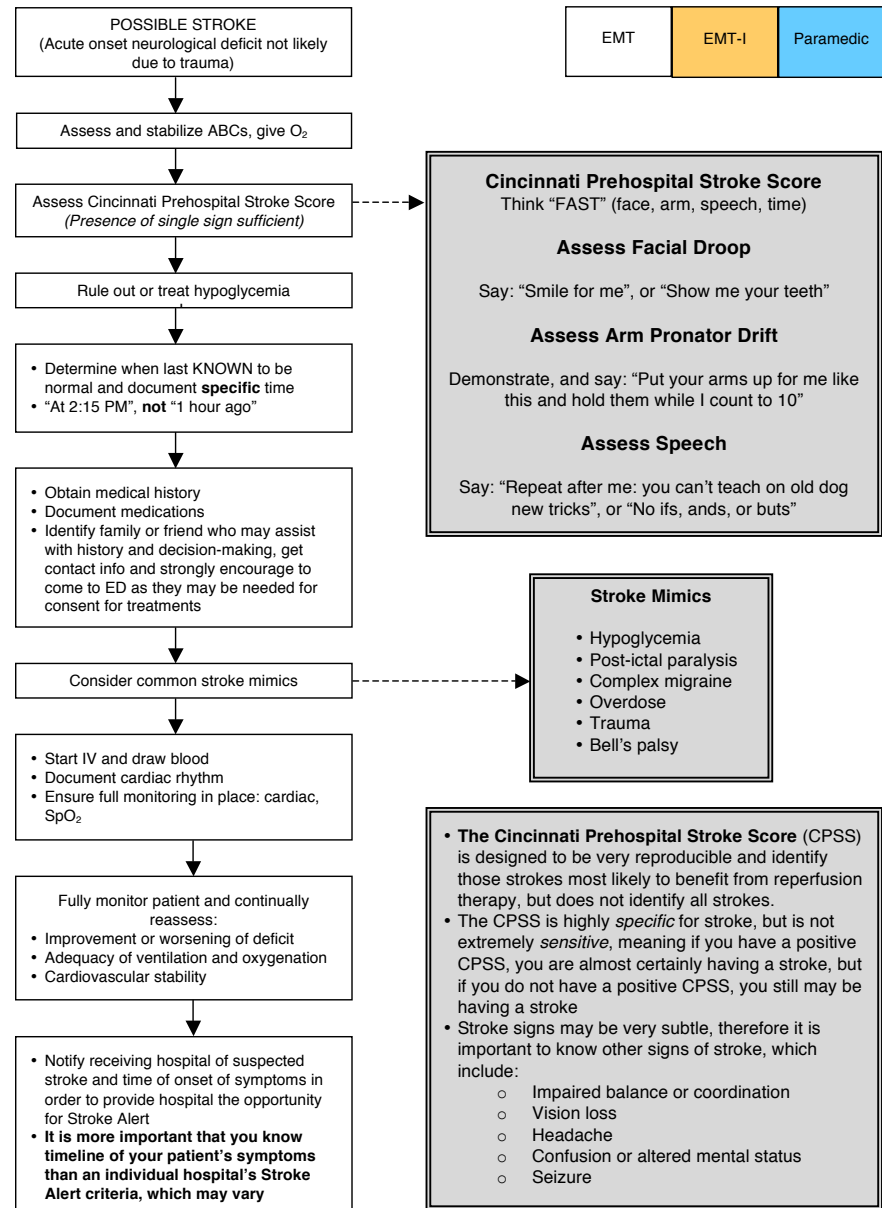
MISCELLANEOUS CHANGES: MEDICAL

- **3050 CHF/ Pulmonary Edema**
 - Nitroglycerin first line intervention
 - CPAP indicated early if inadequate oxygenation or ventilation
 - Note de-emphasis of furosemide for CHF. This is effectively removed for agencies within metro area



MISCELLANEOUS CHANGES: MEDICAL

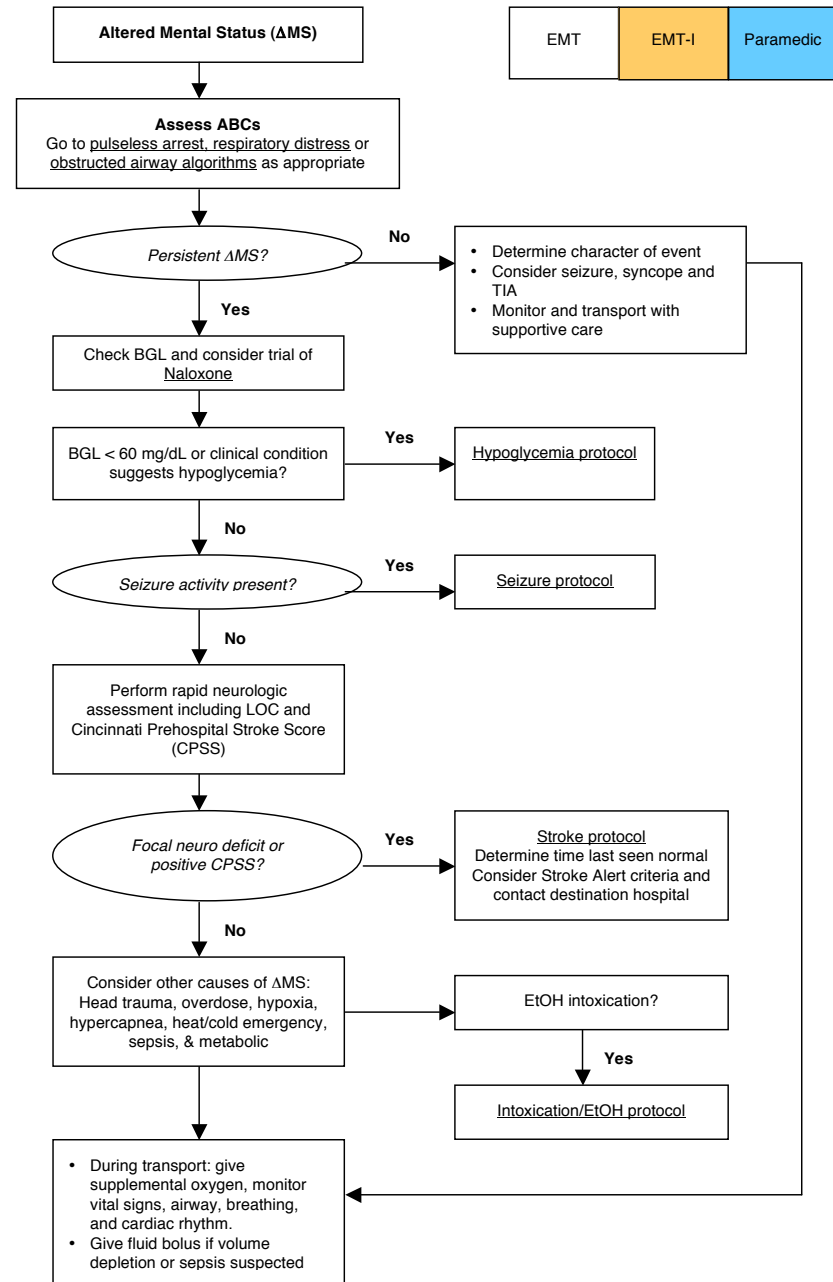
- **4011 Stroke**
 - Emphasis on “time last seen normal” language
 - Cincinnati Scale
 - Stroke mimics
 - Note de-emphasis on knowing individual hospital “stroke alert” criteria, which may vary
 - Emphasize instead on importance of knowing your patient’s timeline



MISCELLANEOUS CHANGES: MEDICAL

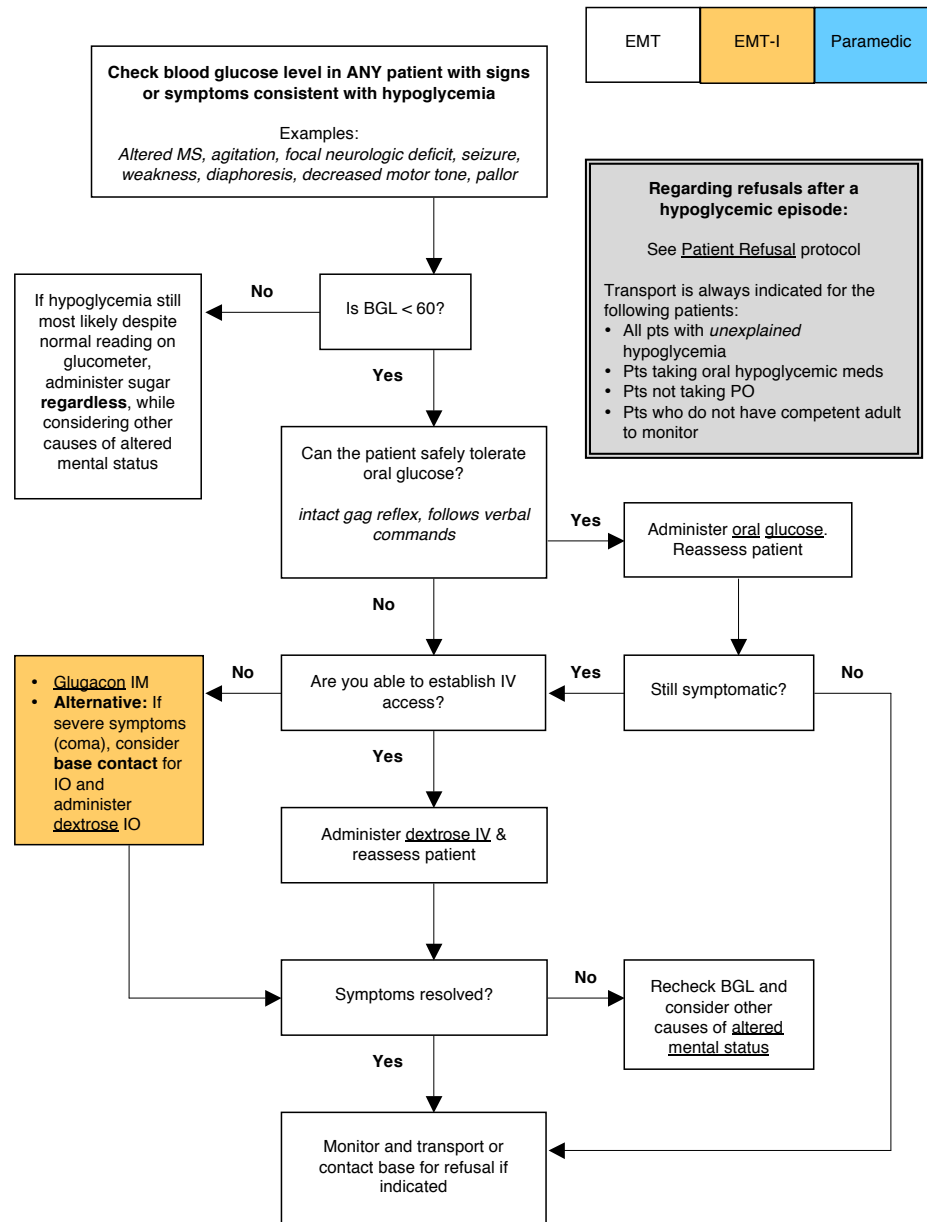
• **New 4012 Universal Altered Mental Status Algorithm**

- Not new clinical content, rather algorithm organizes approach
- Emphasizes importance of BGL, naloxone and stroke recognition
- Differential dx



MISCELLANEOUS CHANGES: MEDICAL

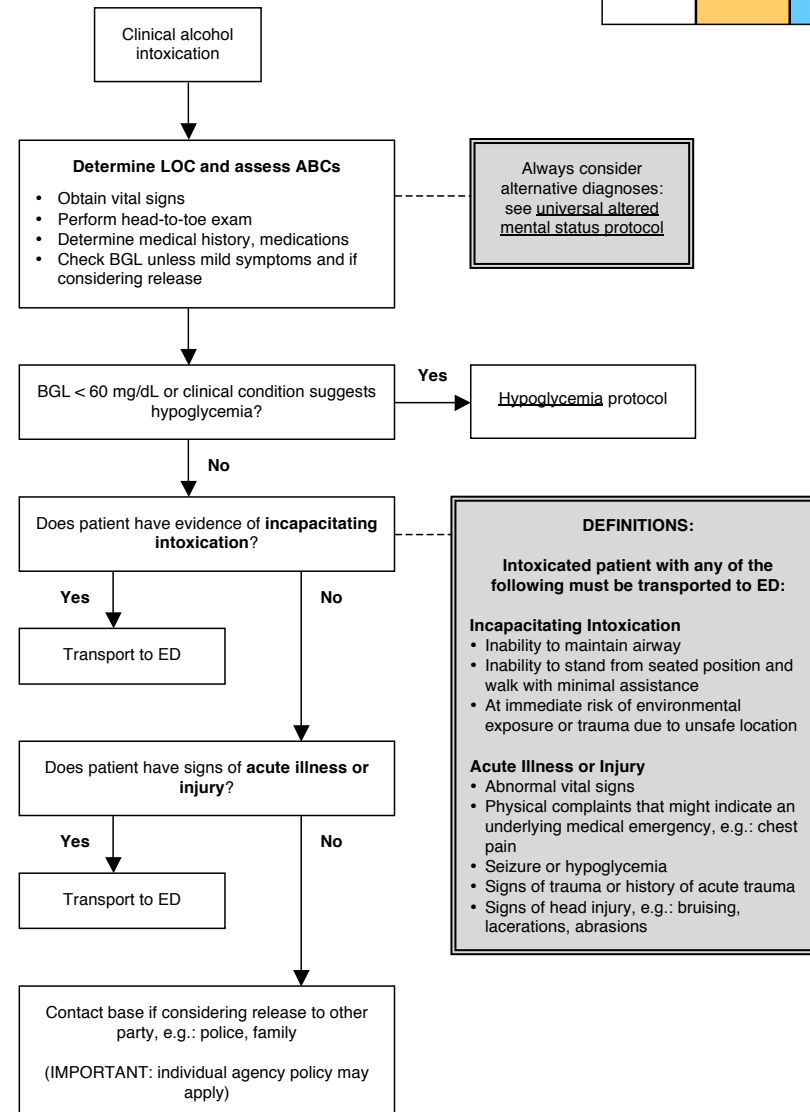
- **4014 Hypoglycemia**
 - Note “transport recommended” teaching points
 - Oral hypoglycemic agents may cause recurrent hypoglycemia as they are long acting. These patients should be transported
 - Note role of glucagon vs. IO for dextrose administration
 - Individual agency policy may apply



MISCELLANEOUS CHANGES: MEDICAL

- **New 4015 Intoxicated Patient**
- Goal to provide clarification on disposition of intoxicated parties
- Incapacitating intoxication defined

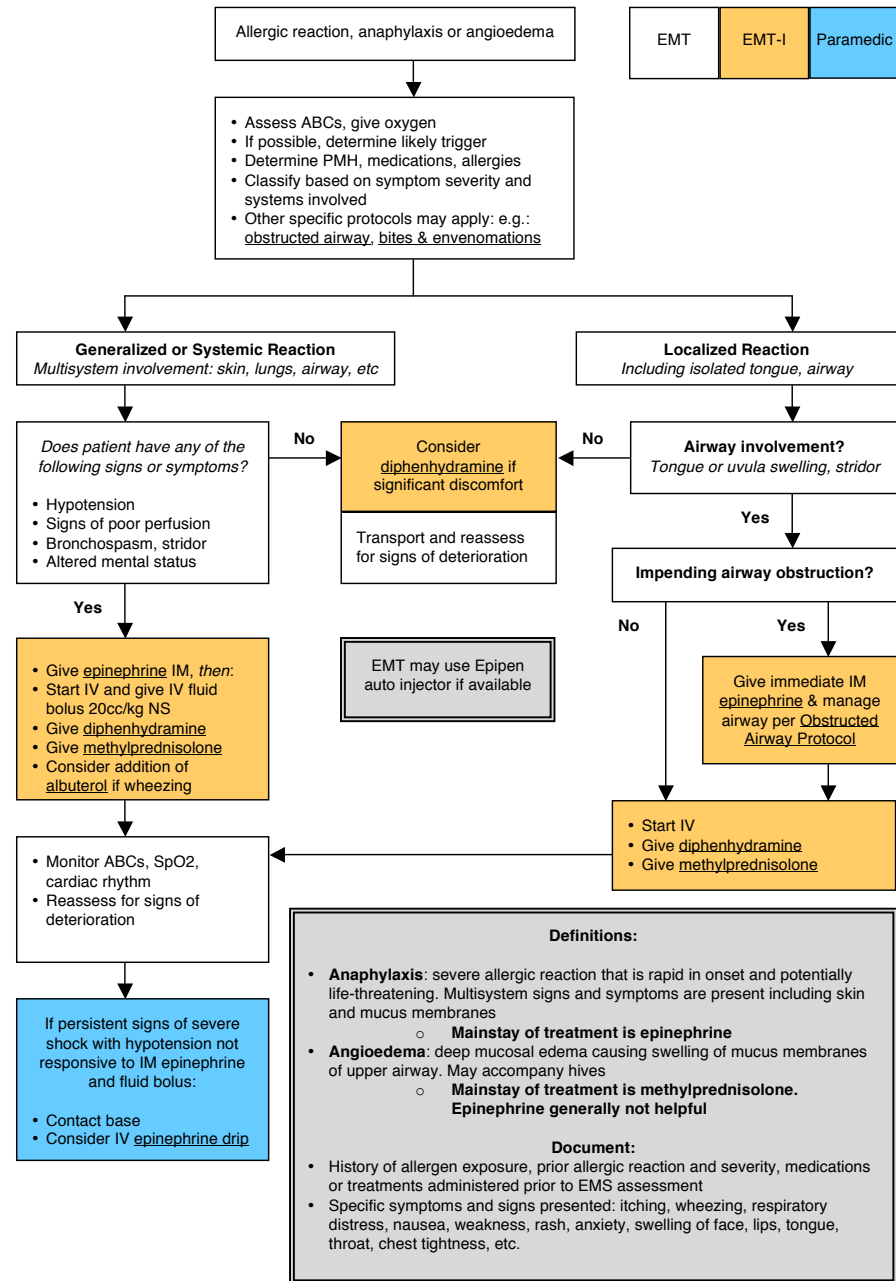
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MISCELLANEOUS CHANGES: MEDICAL

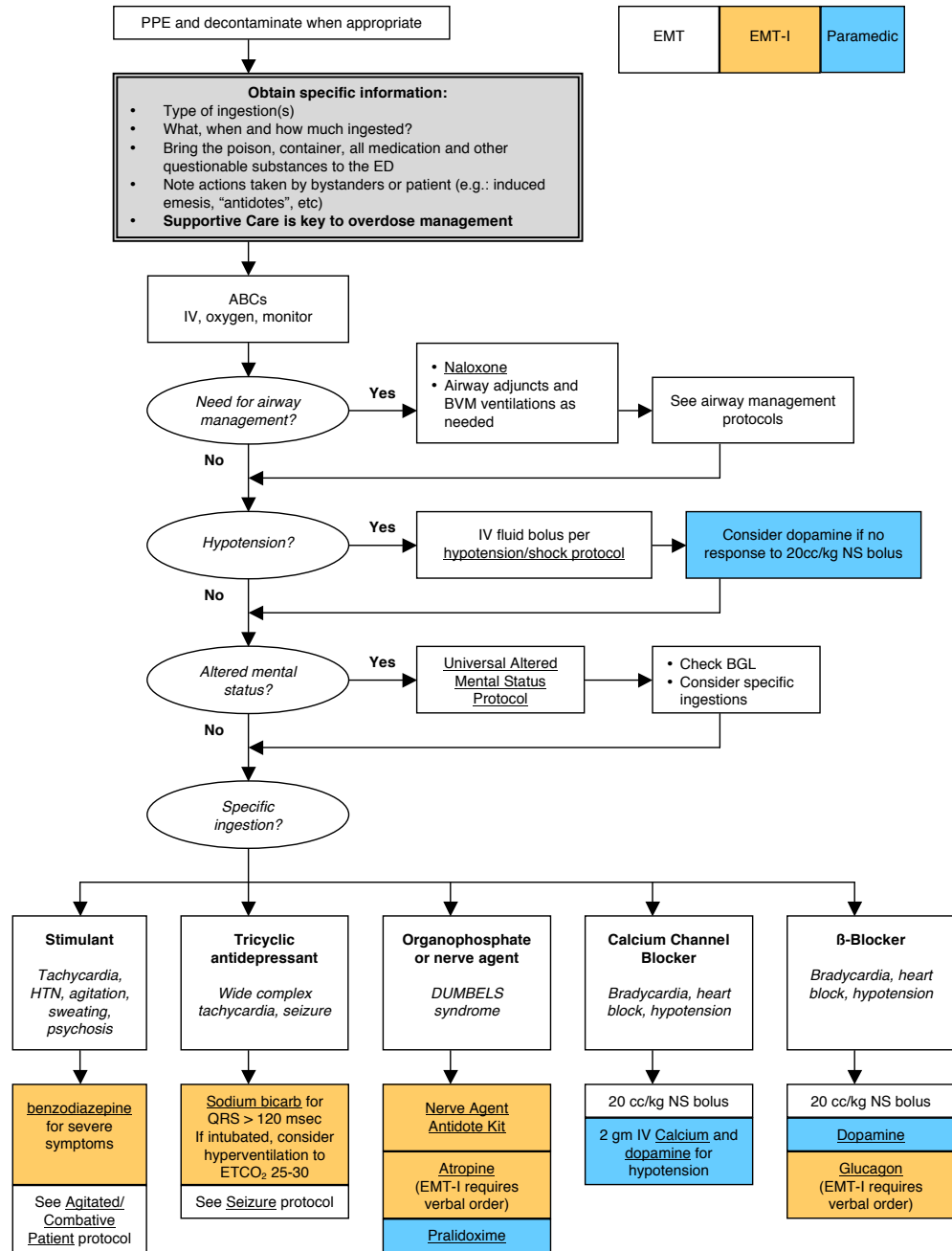
4020 Allergy/ Anaphylaxis

- Note 2 columns: systemic vs. local
- Isolated tongue/lip/airway is localized
- Remember to give epinephrine IM, not sub-cutaneous based on more reliable absorption
- Note EMT may administer EpiPen with **base contact**



MISCELLANEOUS CHANGES: MEDICAL

- **4040 OD and Acute Poisoning**
 - Content organized to emphasize supportive care in all overdose
 - Note antidotes, ingestion/exposure specific treatments at bottom of algorithm



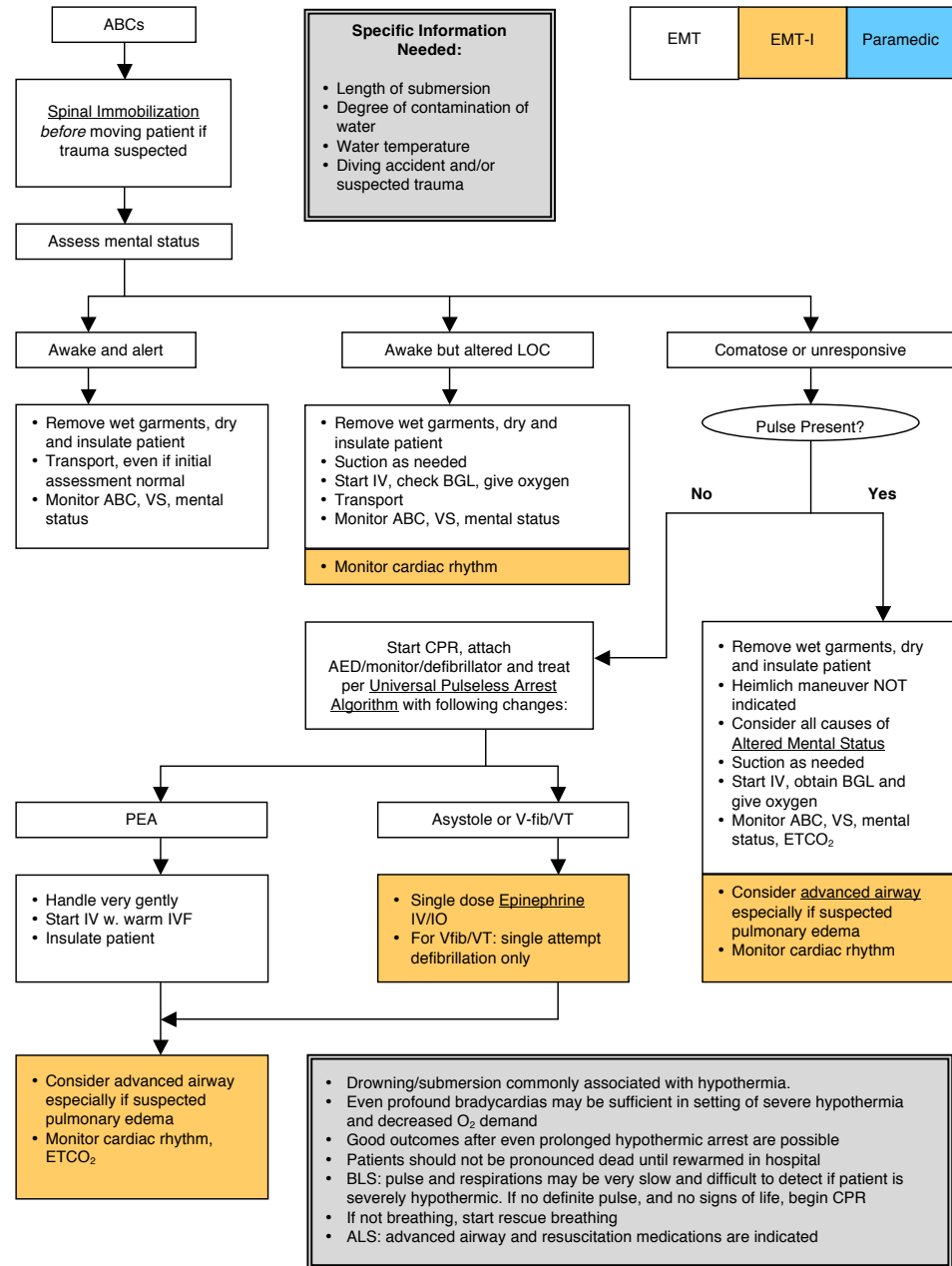
MISCELLANEOUS CHANGES: ENVIRONMENTAL

• 4052 Drowning:

- Algorithm presented here
- Treatment based on mental status

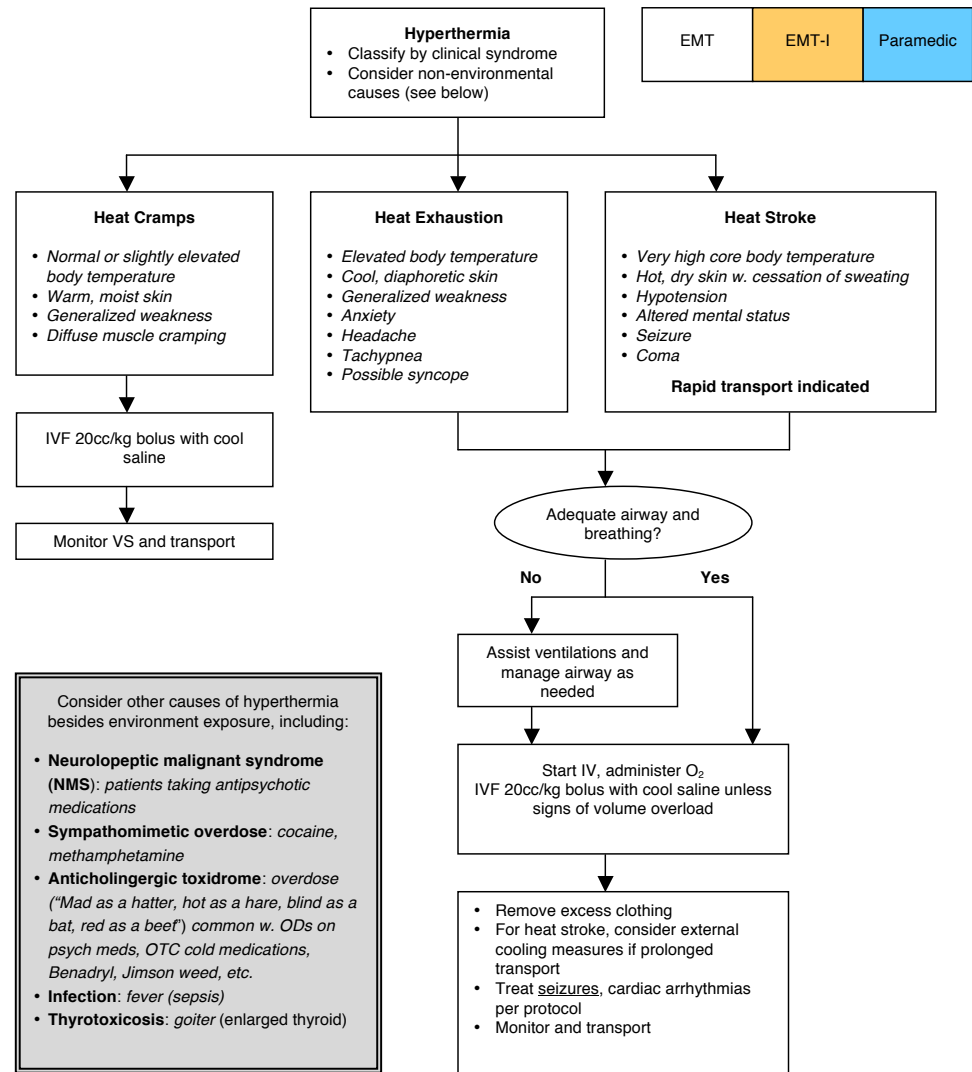
• 4053 Hypothermia:

- See algorithm
- Treatment based on systemic vs. local injury and based on mental status
- Note management of arrest for drowning and hypothermia redundant



MISCELLANEOUS CHANGES: ENVIRONMENTAL

- **4054 Hyperthermia:**
 - Note heat stroke is a medical emergency warranting rapid transport
 - Differential diagnosis of hyperthermia in teaching box



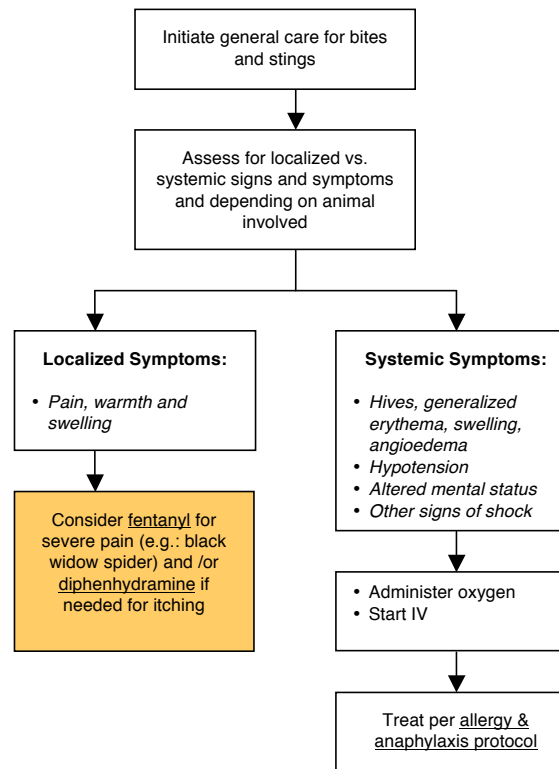
MISCELLANEOUS CHANGES: ENVIRONMENTAL

• 4055 Bites and Stings

- Shown here
- Format change, links to allergy/anaphylaxis

• 4056 Snake bites

- Not shown here
- Note indication for **fentanyl**
- Take a picture of the snake
- Note overlap with allergy/anaphylaxis



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General Care

- 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

Specific Information Needed:

- Timing of bite/sting
- Identification of spider, bee, wasp, other insect, if possible
- History of prior allergic reactions to similar exposures
- Treatment prior to EMS eval: e.g. EpiPen, diphenhydramine, etc

Specific Precautions:

- For all types of bites and stings, the goal of prehospital care is to prevent further envenomation and to treat allergic reactions
- BLS personnel may assist patient with administering own EpiPen and oral antihistamine
- Anaphylactoid reactions may occur upon first exposure to allergen, and do not require prior sensitization
- Anaphylactic reactions typically occur abruptly, and rarely > 60 minutes after exposure

MISCELLANEOUS CHANGES: MEDICAL

New 4060 Medical Hypotension/Shock

- Initial management of shock states is similar regardless of cause.
 - e.g.: adequate fluid resuscitation and identification of rapidly reversible causes, e.g. STEMI, arrhythmia
- Note reference to use of lactate as surrogate marker of tissue hypoperfusion

Shock is a state of decreased tissue oxygenation. Significant vital organ hypoperfusion may be present without hypotension. Home medications and/or comorbidities may also limit development of tachycardia

**

Goal is to maximize **oxygen delivery** with supplemental oxygen and assisted ventilations (if needed), and to maximize **perfusion** with IV fluids

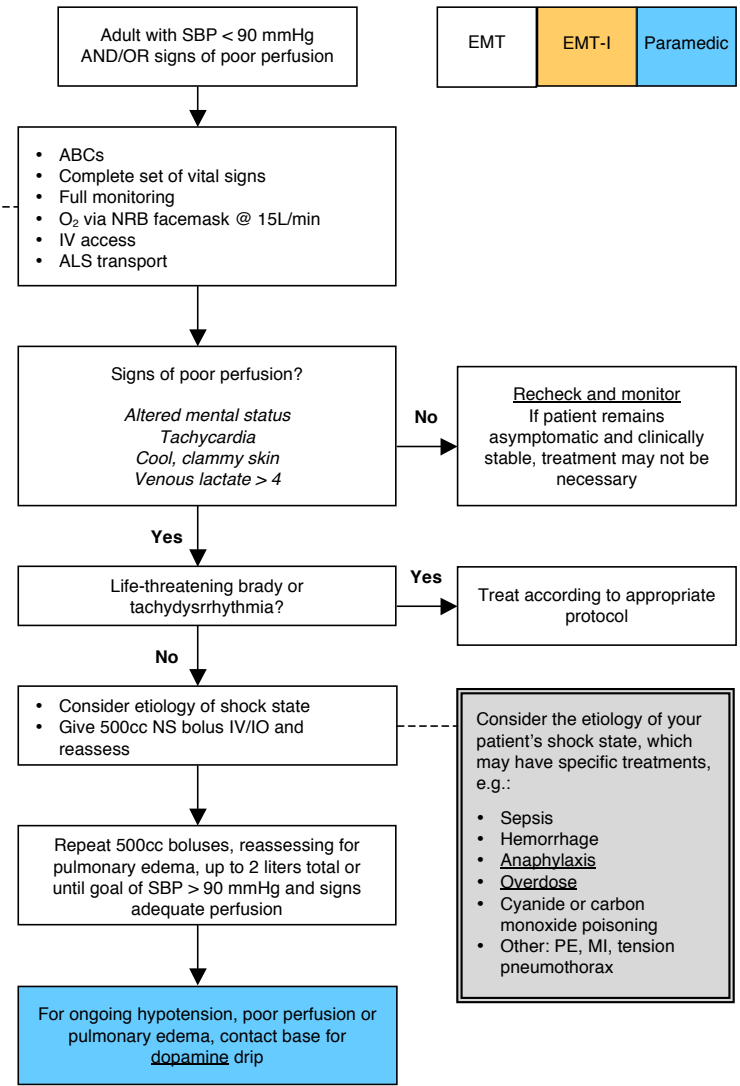
Septic Shock
Defined by:

- Presence of Systemic Inflammatory Response Syndrome (SIRS)
AND
- Suspected infection
AND
- Signs of hypoperfusion (hypotension or elevated venous lactate)

SIRS criteria:

- HR > 110
- RR > 24
- Temp > 100.4° or < 96.8° F

The initial treatment of septic shock involves maximizing perfusion with IVF boluses, not vasopressors



MISCELLANEOUS CHANGES: MEDICAL

4070 Psych/Behavioral

- **No format change**
- **Teaching points:**
 - If intoxicated, no MHH needed
 - If psych/behavioral and not intoxicated, and PD not willing to place MHH, then need BASE CONTACT for MD to place MHH
 - If MHH in place, transport to closest appropriate facility
 - If time and conditions allow, it may be preferable to transport to destination where MD who placed MHH is on duty, however this may not be operationally feasible and is not necessary

MISCELLANEOUS CHANGES: MEDICAL

New 4076 Handcuff protocol

- **This is to help clarify EMS Medical Director preference regarding patients in police custody**
- **Should not change practice, however, there are frequent questions to this point, prompting inclusion of protocol**

MISCELLANEOUS CHANGES: OBSTETRICS

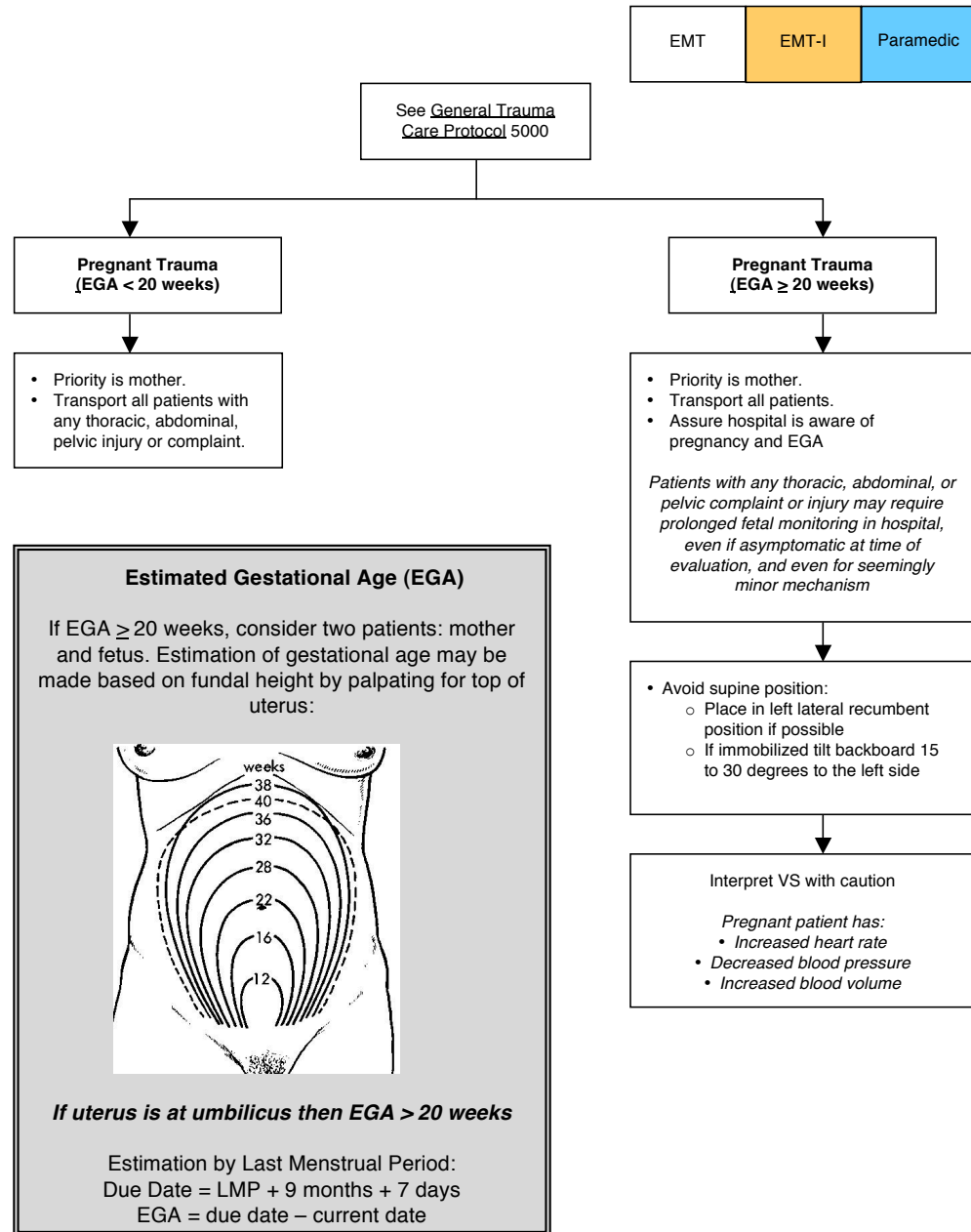
- **4080 Childbirth:**
 - New format
 - Extensive algorithm regarding childbirth to be used as a reference and training tool
 - Note emphasis on “imminent delivery” is initial branch point
- **New 4081 Obstetrical Complications:**
 - Note that this protocol is designed as a reference for rare complications of delivery
 - It is not expected that EMS personnel will have in depth knowledge of the management, rather that EMS will appreciate critical nature of these presentations, need for good supportive care and rapid transport to closest appropriate facility

MISCELLANEOUS CHANGES: OBSTETRICS

- **New 4081 Obstetrical Complications (Continued):**
 - For all patients with obstetrical complications:
 - Do not delay: immediate rapid transport
 - Give high-flow oxygen
 - Start IV en route if time and conditions allow. Treat signs of shock w. IV fluid boluses per Medical Hypotension/Shock Protocol
 - Possible actions for specific complications (see algorithm)
 - *“The following actions may not be feasible in every case, nor may every obstetrical complication be anticipated or effectively managed in the field. These should be considered “best advice” for rare, difficult scenarios. In every case, initiate immediate transport to definite care at hospital”*

MISCELLANEOUS CHANGES: OBSTETRICS

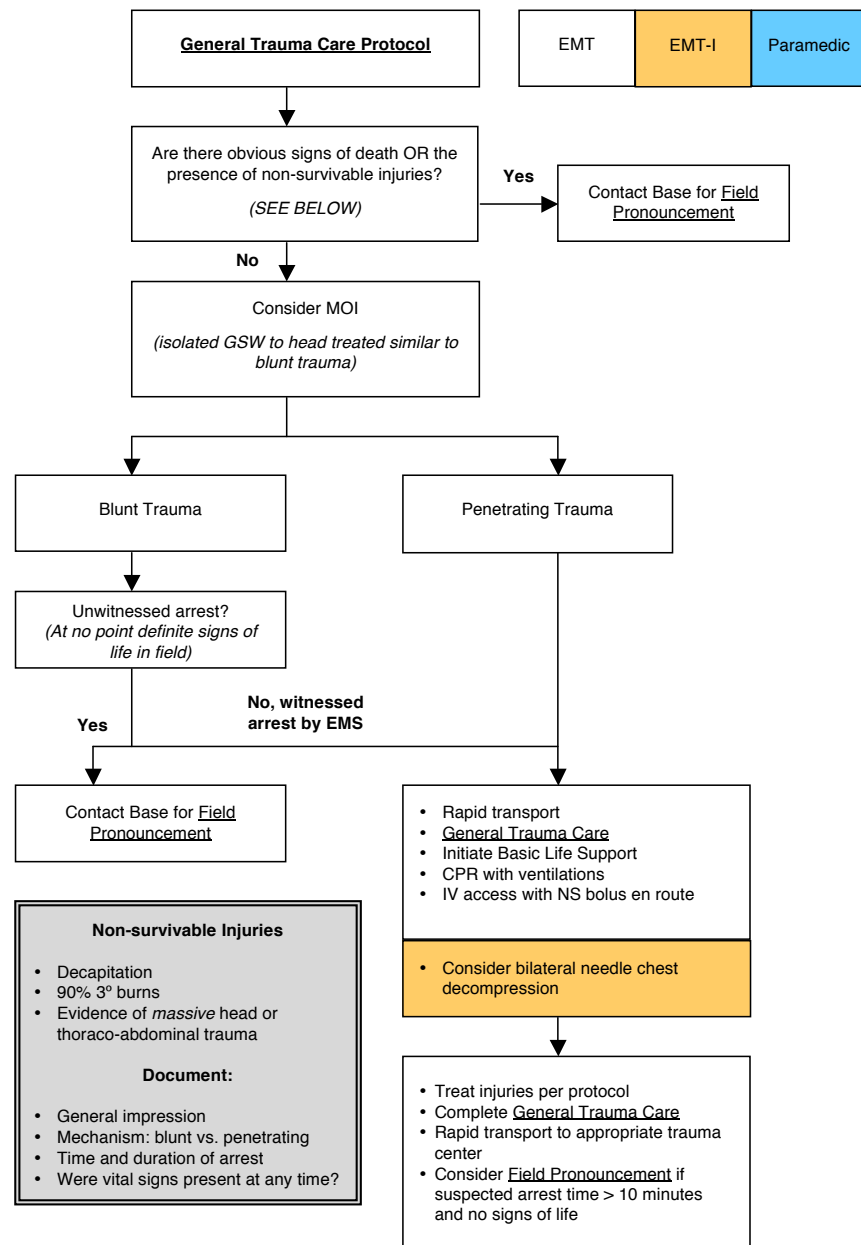
- **New 5006 Trauma in Pregnancy**
 - Note importance of knowing estimated gestational age as above or below 20 weeks
 - Although 20 weeks EGA is pre-viable, this will allow triage with a margin of safety in terms of patients likely to require obstetrical monitoring in addition to evaluation for trauma



HIGHLIGHTED CHANGES: TRAUMA

New 5010 Adult Traumatic Arrest

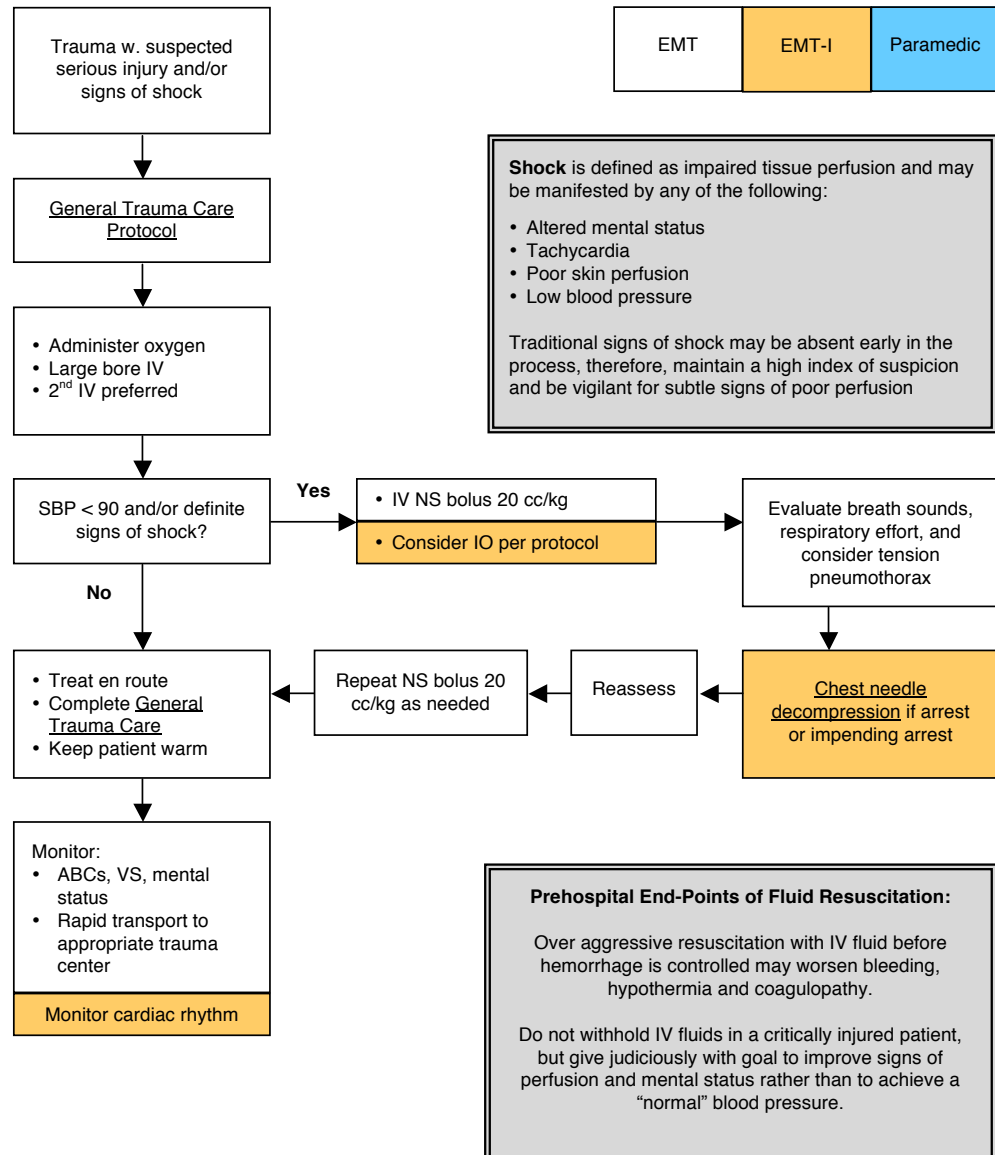
- Unwitnessed blunt arrest:
 - field pronouncement
- Witnessed arrest **or** penetrating trauma mechanism:
 - transport and treat en route
- Isolated GSW to head is like blunt arrest



HIGHLIGHTED CHANGES: TRAUMA

New 5015 Adult Traumatic Shock

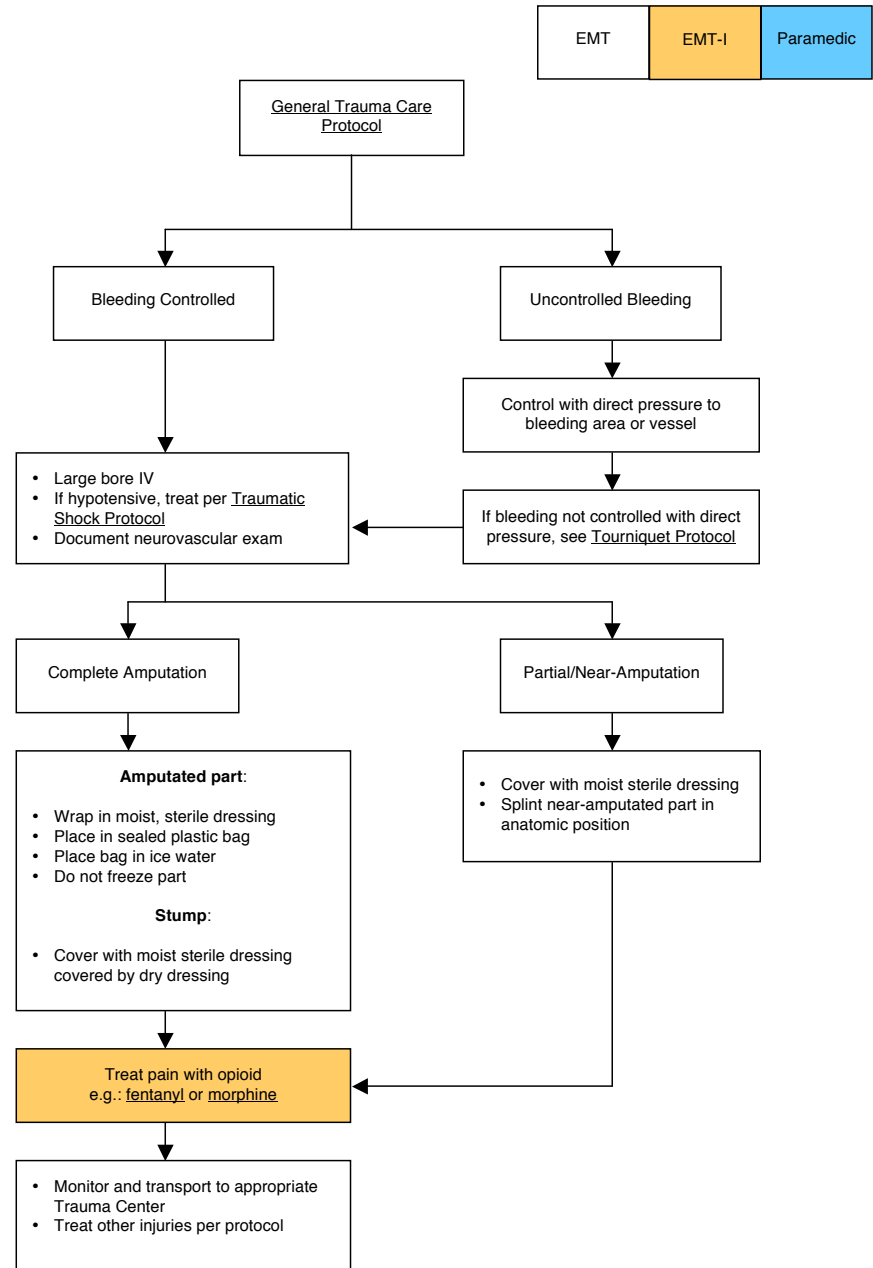
- Over aggressive resuscitation with IV fluid before hemorrhage is controlled may worsen bleeding, hypothermia and coagulopathy.
- Do not withhold IV fluids in a critically injured patient, but give judiciously with goal to improve signs of perfusion and mental status rather than to achieve a “normal” blood pressure.



HIGHLIGHTED CHANGES: TRAUMA

5020 Amputations

- **Simplified algorithm**
 - Bleeding controlled?
 - Partial vs. complete?
- **Reference to Tourniquet Protocol**
- **Pain management**



MISCELLANEOUS CHANGES: TRAUMA

- **5040 Face and Neck Trauma**
 - Note mention of laryngeal trauma.
 - Presents with signs of blunt anterior neck trauma, voice changes, stridor, respiratory distress. A relative contraindication to intubation
- **5060 Chest Trauma**
 - Needle decompression of tension PTX is a standing order (already presented as Procedure Protocol 0210)
- **5090 Burns**
 - New format
 - Note: transport to closest appropriate Trauma Center unless isolated severe burn and time and conditions allow timely direct transport to Burn Center

MISCELLANEOUS CHANGES: PEDIATRICS

- **6005 Pediatric Seizure:** highlighted changes already reviewed
 - IN **midazolam** first line for pediatric seizures
- **6010 Pediatric Pulseless Arrest:** highlighted changes already reviewed
 - BVM ventilation age < 12
 - Pediatric King Airway age ≥ 8 (with waiver)
- **6020 Pediatric Tachycardia w. Poor Perfusion**
 - **Change:** Note that base contact prior to *any* **adenosine** administration is required for children
 - This is due to high rate of unnecessary adenosine administration for sinus tachycardia given rarity of AVNRT in children

MISCELLANEOUS CHANGES: PEDIATRICS

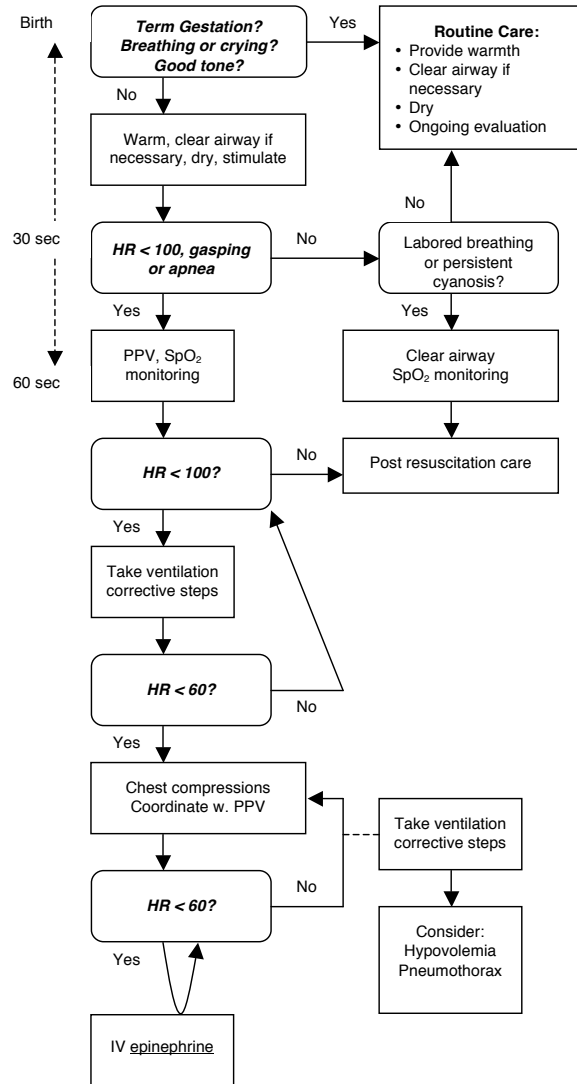
New 6025 Neonatal Resuscitation

- Note simplified approach to identifying infants in need of resuscitation by asking if infant:

1. Is term?
2. Is crying or breathing?
3. Has good muscle tone?

- If answer is “No” to any of these questions, then resuscitate stepwise with 4 interventions as needed:

1. Warm, dry, stimulate, suction airway
2. Ventilate
3. Chest compressions
4. Epinephrine and volume



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General Considerations
(From 2010 AHA Guidelines)

- Newborn infants who do not require resuscitation can be identified generally based on 3 questions:
 - Term gestation?
 - Crying or breathing?
 - Good muscle tone?
- If answer to all 3 questions is “yes” then baby does not require resuscitation and should be dried, placed skin-to-skin on mother and covered to keep warm
- If answer to any of 3 questions is “no” then infant should receive 1 or more of following 4 categories of intervention in sequence:
 - Initial steps in stabilization (warm, clear airway, dry, stimulate)
 - Ventilation
 - Chest compression
 - Administration of epinephrine and/or volume expansion
- It should take approx. 60 seconds to complete initial steps
- The decision to progress beyond initial steps is based on an assessment of respirations (apnea, gasping, labored or unlabored breathing) and heart rate (>< 100 bpm)

Assisting Ventilations:

- Assist ventilations at rate of 40-60 breaths per minute to maintain HR > 100

Chest compressions:

- Indicated for HR < 60 despite adequate ventilation w. supplemental O₂ for 30 seconds
- 2 thumb – encircling hands technique preferred
- Allow chest recoil
- Coordinate with ventilations so not delivered simultaneously
- 3:1 ratio of compressions to ventilations w. exhalation occurring during 1st compression after each ventilation

MISCELLANEOUS CHANGES: NEONATAL RESUSCITATION CASE

- A preterm infant is born at 30 weeks EGA with poor tone and no cry. What are the initial steps in resuscitation?
- **Stimulate, dry, warm, and suction airway**
- After these steps, infant still has poor color and abnormal breathing. What are the next interventions?
- **Begin BVM ventilations and check pulse**
- Pulse is < 100 . what are next steps?
- **Ensure adequate ventilation. If HR still < 100 , begin chest compressions**

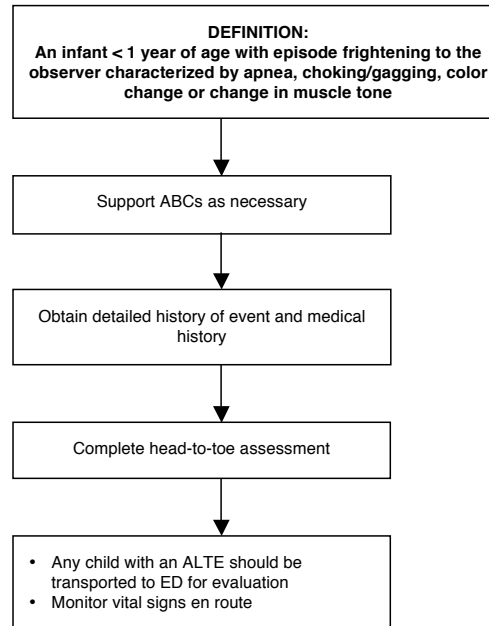
MISCELLANEOUS CHANGES: PEDIATRICS

- **New 6050 Universal Pediatric Respiratory Distress**
 - This is a busy slide, but contains algorithms for common causes peds resp distress broken down by presenting symptoms and medical history
- **Changes:**
 - Note that endotracheal intubation is **ONLY** indicated if patient cannot be ventilated by less invasive means
 - Bronchiolitis: **racemic epinephrine** preferred bronchodilator
 - Croup: indications for **racemic epinephrine** clarified:
 - Indicated for severe symptoms or **stridor at rest**

MISCELLANEOUS CHANGES: PEDIATRICS

New 6060 Pediatric Apparent Life Threatening Event (ALTE)

- Provides guidance and context for this common pediatric complaint



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Clinical history to obtain from observer of event:

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

Past Medical History:

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

Examination/Assessment

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

MISCELLANEOUS CHANGES: PEDIATRICS

New 6070 Pediatric Trauma Considerations

- **This protocol provides guidance on spinal immobilization and children**
- **Unlike in adults, there is much more limited data regarding safety and appropriateness of selective immobilization¹**
- **Pediatric spinal injuries are rare, are usually in the cervical spine, and occur between C1 and C3¹**
- **In general, pediatric guidelines are more conservative¹**
 - Additional clinical signs suggesting injury include torticollis, which is a child with head held turned to the side and fixed

1. Kupperman et al. Factors associated with cervical spine injury in children after blunt trauma. *Ann Emerg Med.* 2011; 58(2):145-55

MISCELLANEOUS CHANGES: PEDIATRICS

New 6070 Pediatric Trauma Considerations (Continued)

- **Immobilize the following patients, as well as any child you suspect clinically may have a spine injury:**
 1. Altered Mental Status (GCS < 15, AVPU < A, or intoxication)
 2. Focal neurologic findings (paresthesias, loss of sensation, weakness)
 3. Non-ambulatory patient
 4. Any complaint of neck pain
 5. Torticollis (limited range of motion, difficulty moving neck in history or physical)
 6. Substantial torso Injury (thorax, abdomen, pelvis)
 7. High Risk MVC (head on collision, rollover, ejected from the vehicle, death in the same crash, or speed > 55 m/h)
 8. Diving accident



THANK YOU

NEXT UPDATE: JANUARY 2012

Denver Metro EMS Medical Directors

Dylan Luyten, MD for Denver Metro EMS Medical Directors