


DENVER METRO
EMS MEDICAL DIRECTORS



PROTOCOL UPDATES
JULY 2024

Denver Metro Emergency Medical Services (EMS) Medical Directors Statement for Prehospital Providers

Shared Goal: *To create a framework for emergency medical care within our community, that supports safe and effective treatment and transport of patients experiencing medical emergencies to the hospital, built on the most up to date and patient-safety centered medical literature.*



General Summary of Changes

- ▣ Many of the changes in the July 2024 update reflect language, and dosing for pediatric content across a range of various protocols.
- ▣ All references to “hyperactive delirium” have now been removed and treatment protocols updated to reflect current practices.
- ▣ Some protocol treatment algorithms have been streamlined and re-organized for better flow.
- ▣ Language updates throughout for clarity

July 2024 Updated Item List

- Hyperactive Delirium
- Age Definitions
- Free Standing ED
- Quick Reference Guide
- Physical Restraint
- Adult Wheezing
- Pediatric Wheezing
- Neonatal Resuscitation
- Bradycardia
- LVAD Protocol
- Seizures
- Hypoglycemia
- Overdose/Poisoning
- Allergy and Anaphylaxis
- Drowning
- Hypothermia
- Agitated/Combative
- Hyperactive Delirium
- Obstetrics
- General Trauma
- Traumatic Shock
- Head Trauma
- Face and Neck Trauma
- Chest Trauma
- Med Admin Guidelines
- Benzodiazepines
- Butyrophenones
- Calcium
- Epinephrine
- NSAIDS
- Racemic Epinephrine
- Sodium Bicarbonate
- Medication Extended Care Supplement

Hyperactive Delirium with Severe Agitation

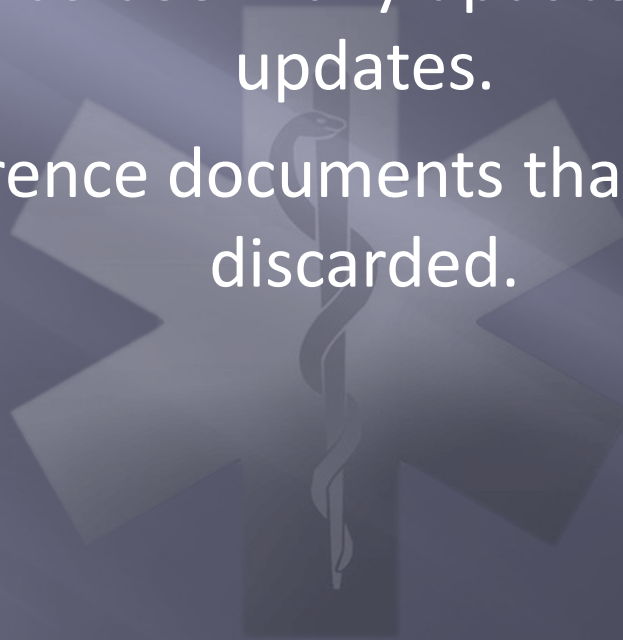
All references to Hyperactive Delirium with Severe Agitation have been removed from the Denver Metro Protocols, as it is no longer supported terminology.

Refer to the updated 6010 Agitated/Combative Patient protocol.

0990 Quick Reference for Procedures and Medications Allowed by Protocol

The Quick Reference has been fully updated to reflect the July 2024 updates.

Any previous Quick Reference documents that have been saved should be discarded.



0015 Age Definitions

ADDED:

Age definitions have been updated for pediatrics in the protocols, and now include the category of “Newly Born”, being less than 48 hours old.

0015 GENERAL GUIDELINES: AGE DEFINITIONS

INTRODUCTION

For the purposes of these clinical care protocols, the following age guidelines will be used. These are general guidelines, however individual protocols, including medication dosages, may deviate from these age ranges.

ADULT

Adult patients are considered 12 years of age or older.

GERIATRICS

Geriatric patients will be considered 65 years of age or older. Geriatric specific indications will be indicated by a green box.

Geriatric Protocol

PEDIATRICS

Pediatric specific considerations will be noted by a purple box. Pediatric age can be defined in the following categories:

Pediatric Protocol

Age Category	Age Range
Pediatric	<12 years
Neonate	<1 month
Newly born	<48 hours

0110 Free Standing Emergency Dept.

and agency medical director with consideration of the guidance given below.

Recommendations

A. **Hemodynamically stable patients** may be **considered** for transport to a hospital-affiliated FSED with the following exceptions:

1. No OB patients > 20 weeks estimated gestational age
2. No trauma patients meeting RETAC trauma center destination guidelines.
3. No alerts (e.g. STEMI, stroke, sepsis).
4. No post-cardiac arrest patients with ROSC unless uncontrolled airway
5. No neonates <29 days of age
6. Children with Medical Complexity (CMC) – Refer to pediatric considerations
7. Elderly patients often require hospitalization for conditions such as falls, generalized weakness, dehydration, syncope.

B. A psychiatric patient may exceed the capability of the FSED. The facility may not have security available or be able to provide psychiatric evaluation. These patients should be transported to facilities with the capabilities to meet patient's needs.

C. When time and conditions allow, patients whom pre-hospital providers presume to require inpatient management should be transported to a hospital emergency department to avoid subsequent patient transfers.

Pediatric Considerations:

- Given the limited capacity of some facilities to care for children, to reduce likelihood of secondary transfers, certain pediatric conditions should be transported to a hospital or pediatric specific facility. These include:
 - Pediatrics with an emergency related to a known condition previously treated at a specific facility
 - Child ≤ 2 years with altered mental status and no known seizure disorder
 - Shock/sepsis
 - DKA/hyperglycemia with altered mental state
 - Seizure patient requiring benzodiazepine
 - Severe respiratory distress
 - BRUE (Brief Resolved Unexplained Events, formerly ALTE)
 - Suspected child abuse
 - Suspected neck injury with paresthesia, weakness, or other neurologic deficits
 - Significant soft-tissue injury/complex wound

ADDED:

subitems 5, 6, and 7 under “A” (Criteria Exceptions to Transport)

- 5 - No neonates < 29 days
- 6 – Children with CMC refer to Ped Considerations
- 7 – Consideration that elderly patients often require inpatient hospitalization

Purple Pediatric Considerations box for Children with Medical Complexity (CMC)

1130 Physical Restraint Procedure Protocol

REMOVED:

Reference to “Hyperactive Delirium” in Complications

ADDED:

“Improved Montgomery County – Richmond Agitation-Sedation Scale” (IMC-RASS) score to Documentation requirements (see 6010)

may never be left unattended.

Documentation

- A. Document the following in all cases of restraint:
1. Description of the facts justifying restraint, including IMC-RASS score
 2. Efforts to de-escalate prior to restraint
 3. Type of restraints used
 4. Condition of the patient while restrained, including reevaluations during transport
 5. Condition of the patient at the time of transfer of care to emergency department staff
 6. Any injury to patient or to EMS personnel

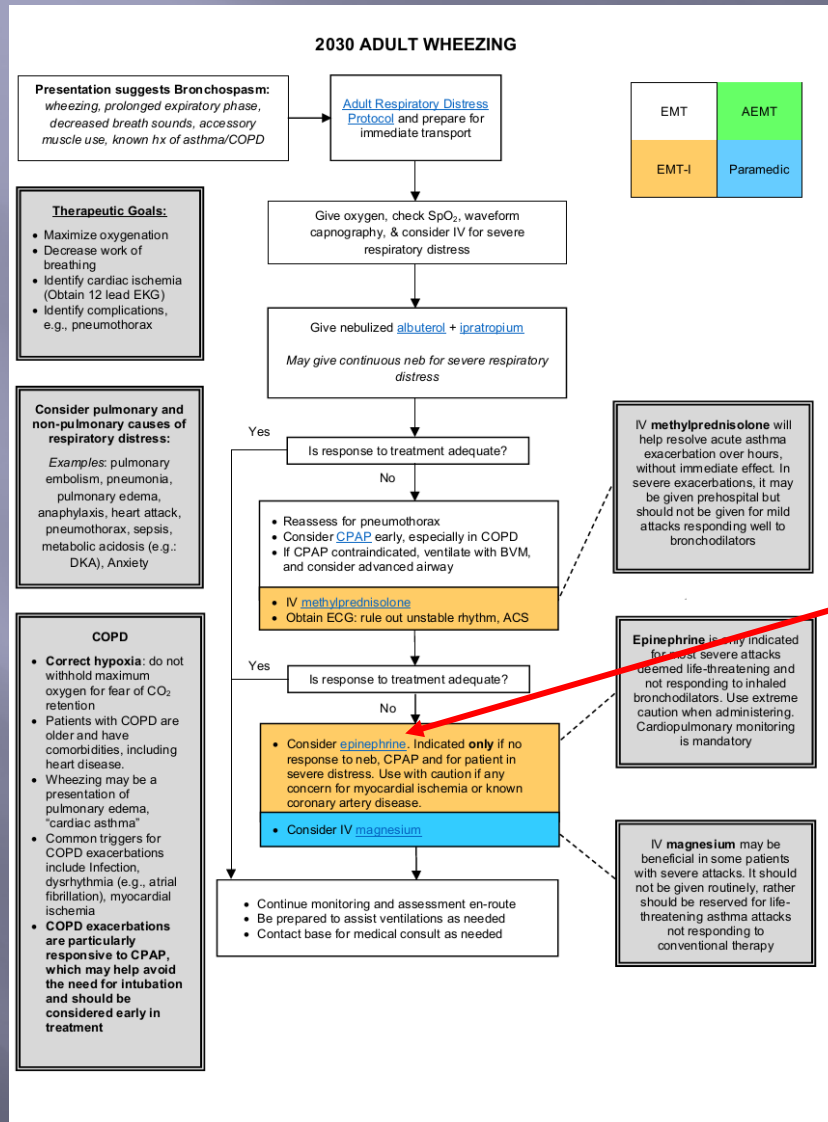
Approved by Denver Metro EMS Medical Directors July 1, 2024. Next review January 2025

1130 PROCEDURE PROTOCOL: RESTRAINT PROTOCOL

Complications:

- A. Aspiration: continually monitor patient's airway
- B. Nerve injury: assess neurovascular status of patient's limbs during transport
- C. Complications of medical conditions associated with need for restraint - Patients may have underlying trauma, hypoxia, hypoglycemia, hyperthermia, hypothermia, drug ingestion, intoxication, or other medical conditions

2030 Adult Wheezing



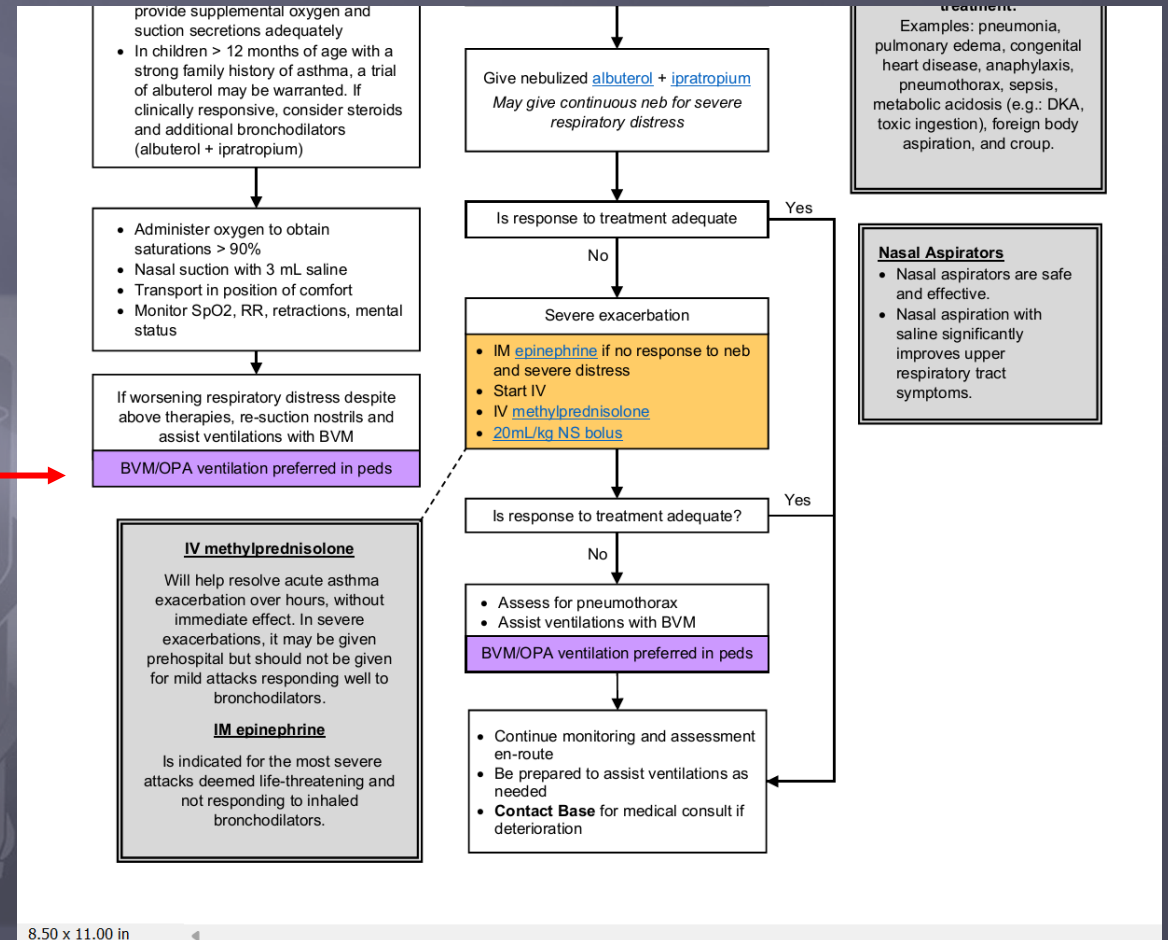
REMOVED:

Reference to IM route for epinephrine in the wheezing protocol. This criteria was moved to the epinephrine protocol itself (9120)

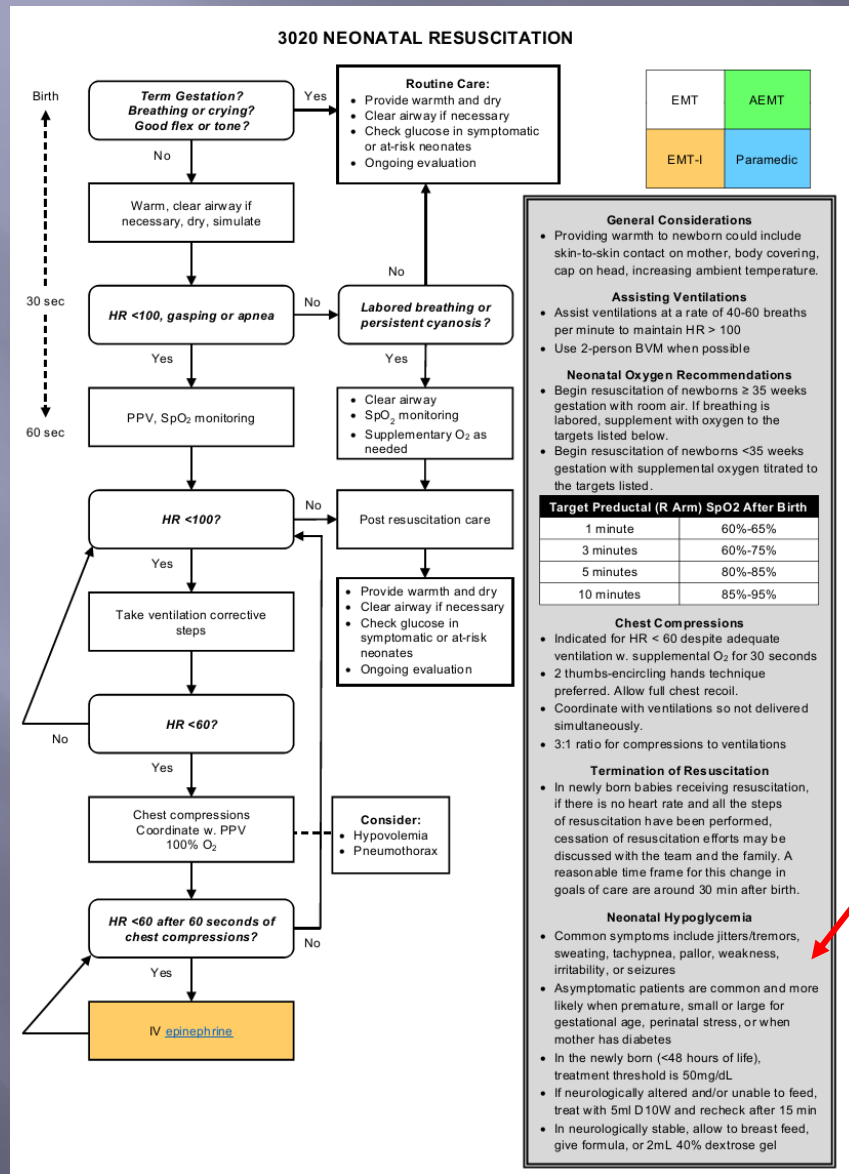
2040 Pediatric Wheezing

CHANGED:

Updated text from “BLS Airway preferred” to “BVM/OPA ventilation”



3020 Neonatal Resuscitation



CHANGED:

Grey box updated with additions and streamlined content to help with protocol flow, and addition of Neonatal Hypoglycemia content.

3050 Bradycardia

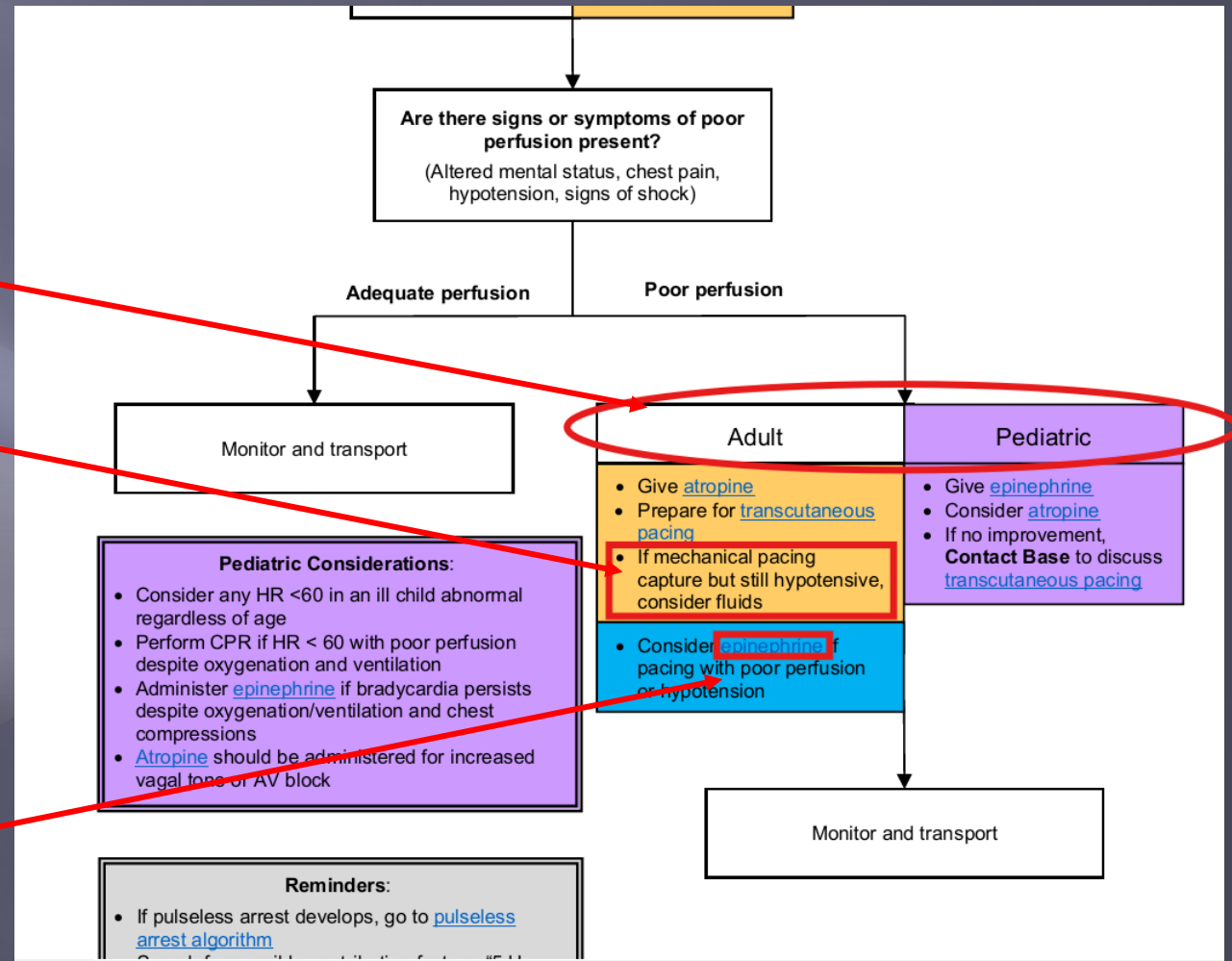
ADDITION:

“Adult” and “Pediatric”
treatment headers.

Consideration for fluids in
cases of mechanical capture
with hypotension.

CHANGED:

“vasopressor” changed to
specify “epinephrine”



3090 Ventricular Assist Devices

CHANGE:

- ▣ Phone number updated to 720-848-LVAD (5823)

Key Points

- Unstable VAD patients should be transported to the nearest appropriate facility. University of Colorado Hospital is the only facility in the region that definitively treats VAD patients—and is therefore the preferred destination when patient condition is stable and conditions/operational factors allow transport.
- **Contact VAD Coordinator as soon as possible at 720-848-LVAD (5823). For pediatric patients contact the Children's Hospital Colorado transplant coordinator at 303-890-3503.** Provide patient name, DOB, condition & ETA at destination for consultation and/or if transporting to University of Colorado Hospital. VAD coordinator will call back.
- VAD patient family members are excellent resources to assist with patient history and evaluation/repair of VAD alarms/faults.
- **It is vital to transport the patient's back-up batteries and emergency equipment with the patient.**
- Device specific information for EMS can be found at: <https://www.mylvad.com/medical-professionals/resource-library/ems-field-guides>

4040 Seizure

Protocol flow updated to accommodate management of seizure with pregnancy.

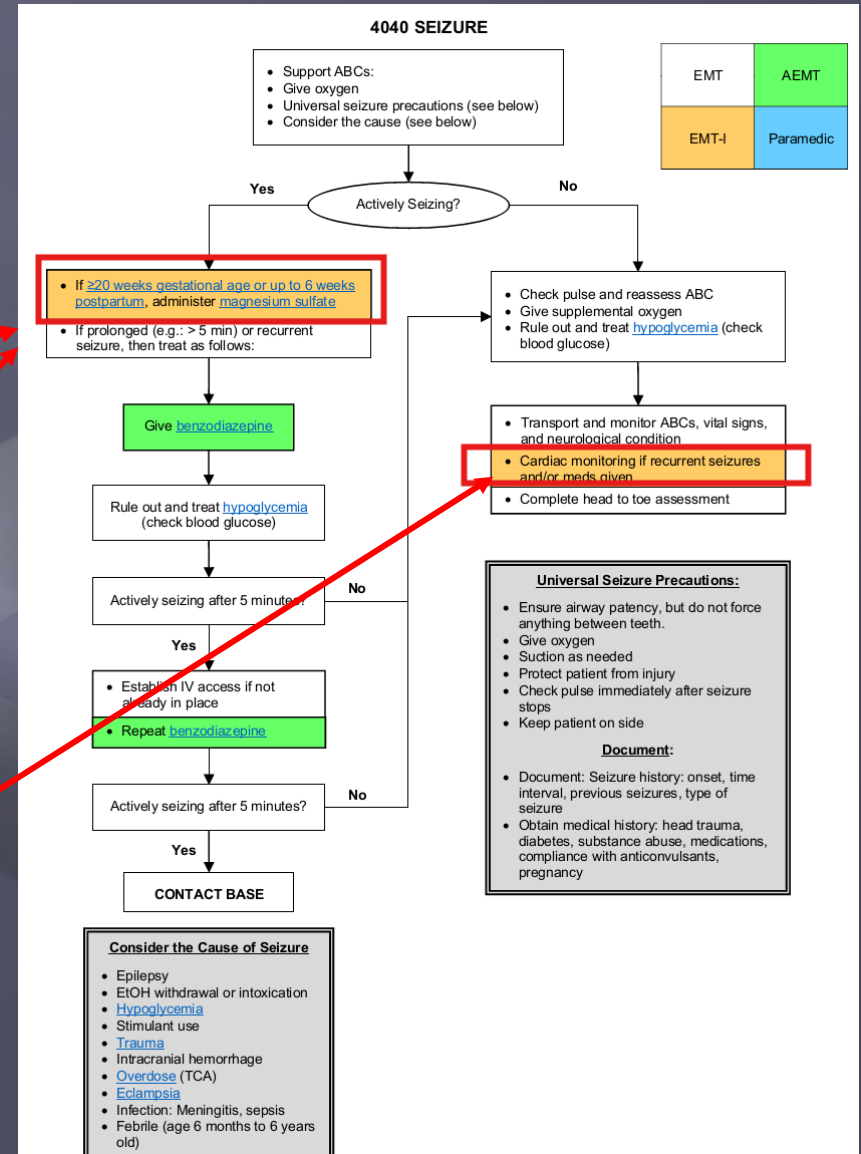
REMOVED:

Treatment content referring to brief self-limited seizures.

CHANGED:

Pregnancy content moved from grey box, to top of Treatment box flow.

Highlighted cardiac monitoring requirement



4050 Hypoglycemia

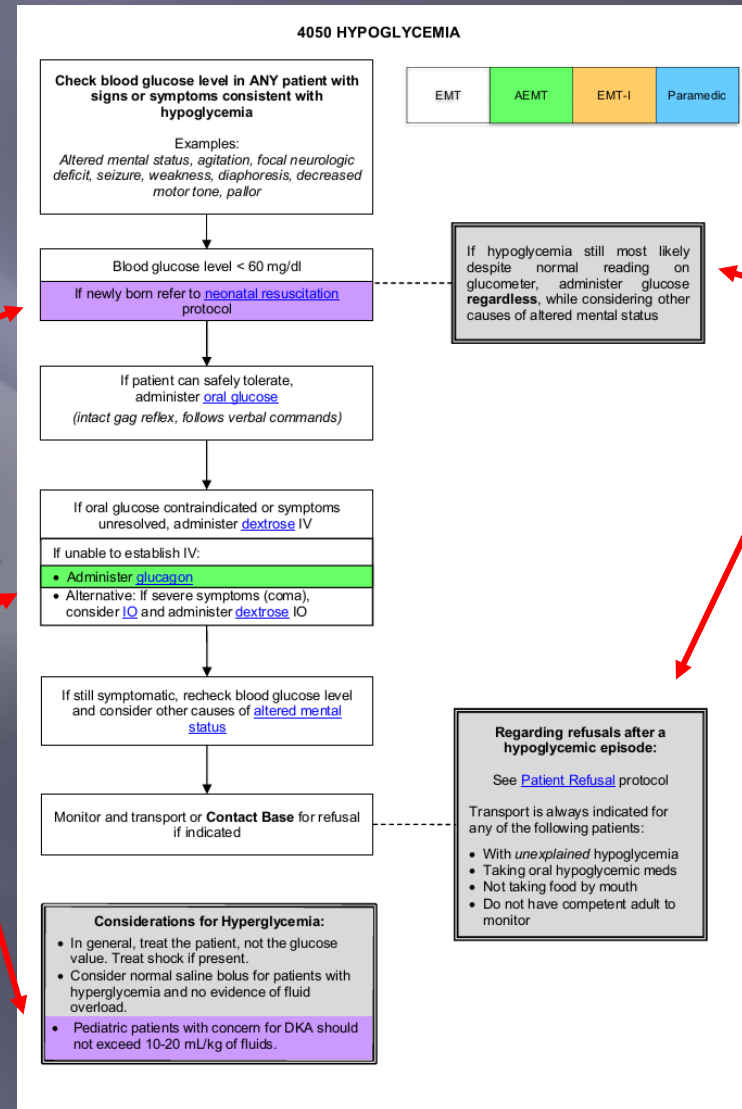
New, more linear, protocol flow and look. Added new pediatric information and links

ADDED:

Neonatal links for newly born and info on pediatrics added

CHANGED:

Glucagon administration box moved to be more integrated with the flow.

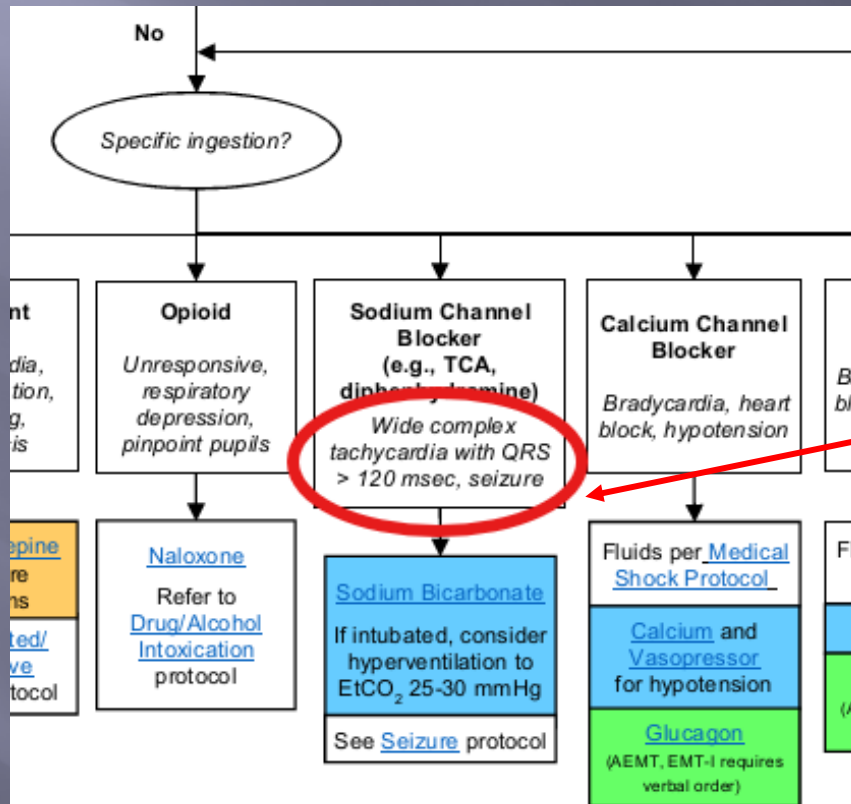


CHANGED:

Grey boxes swapped around for alignment with protocol flow.

4080 Overdose and Acute Poisoning

Added QRS info under
Sodium Channel Blocker
indication



ADDED:

"QRS > 120 msec"

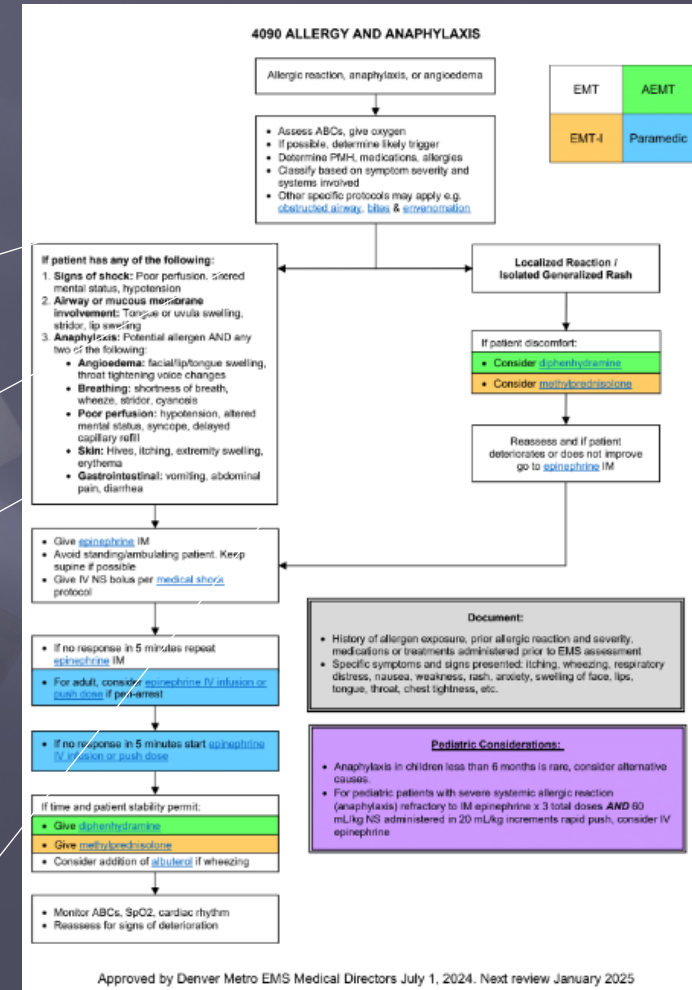
4090 Allergy and Anaphylaxis

Entire protocol and flow streamlined to be easier to follow.

CHANGED:
Improved Indications box now also includes gastrointestinal conditions

If patient has any of the following:

- Signs of shock:** Poor perfusion, altered mental status, hypotension
- Airway or mucous membrane involvement:** Tongue or uvula swelling, stridor, lip swelling
- Anaphylaxis:** Potential allergen AND any two of the following:
 - Angioedema:** facial/lip/tongue swelling, throat tightening voice changes
 - Breathing:** shortness of breath, wheeze, stridor, cyanosis
 - Poor perfusion:** hypotension, altered mental status, syncope, delayed capillary refill
 - Skin:** Hives, itching, extremity swelling, erythema
 - Gastrointestinal:** vomiting, abdominal pain, diarrhea



5000 Drowning

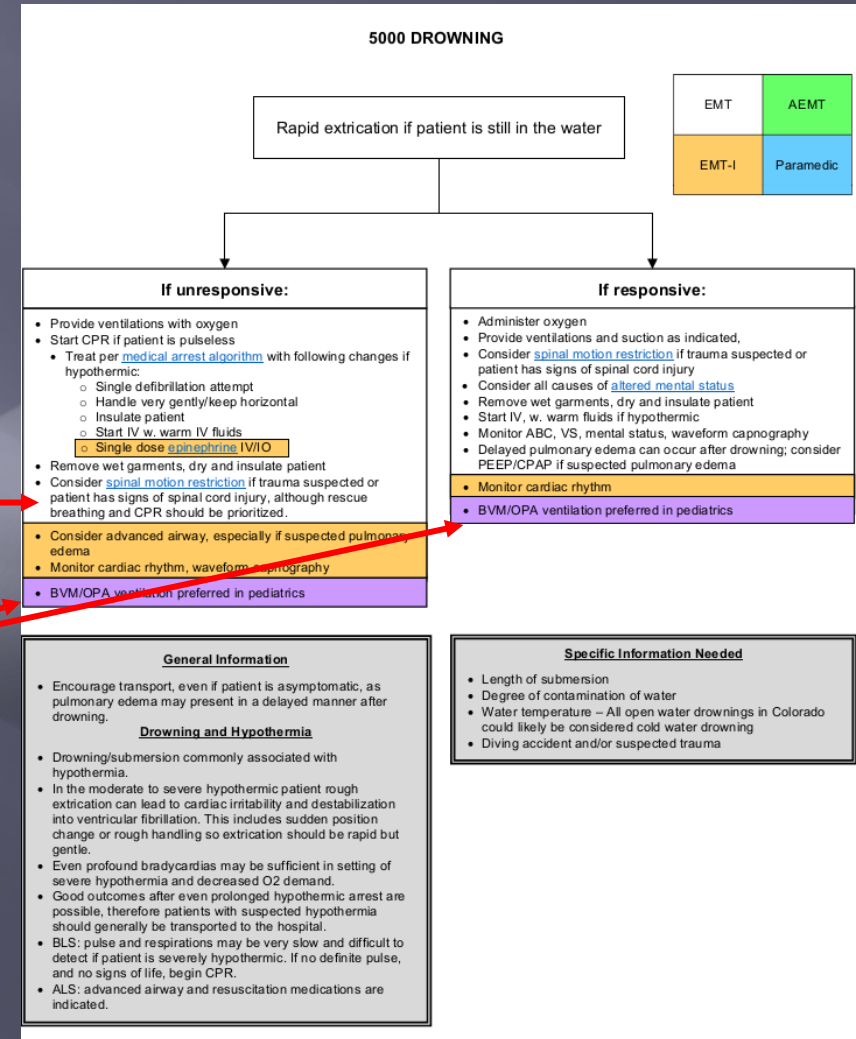
Entire protocol and flow streamlined to be easier to follow.

CHANGED:

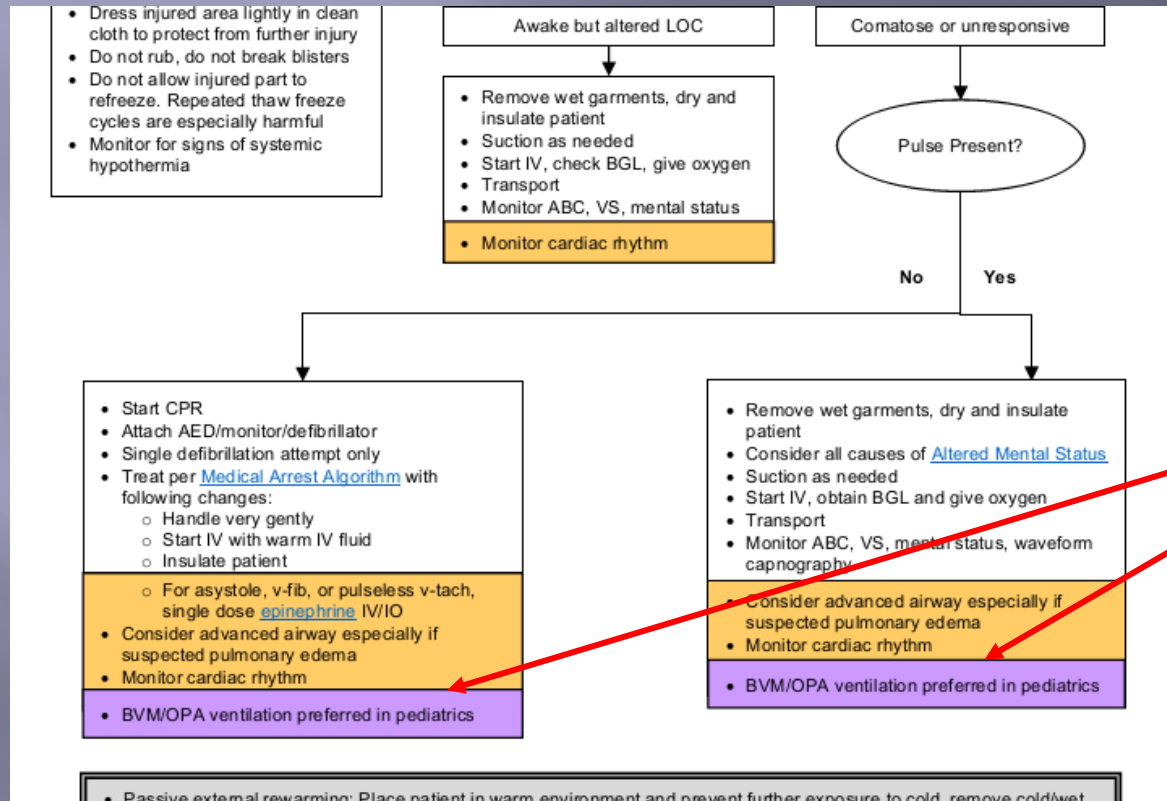
For unresponsive patients, Spinal Motion restrictions moved farther down the algorithm

CHANGED:

“BLS Airway” changed to “BVM/OPA ventilation”



5010 Hypothermia



CHANGED:
“BLS Airway” changed to
“BVM/OPA ventilation”

6010 Agitated/Combative Patient

REMOVED:

hyperactive delirium

CHANGED:

Look, flow, and treatment guidance color coded to + IMC-RASS Scoring

6010 AGITATED/COMBATIVE PATIENT PROTOCOL

Principles:

While treating patients experiencing agitation, the safety of EMS providers should be maximized while honoring patient dignity and treating the patient's medical condition in a professional manner.

EMT	AEMT
EMT-I	Paramedic

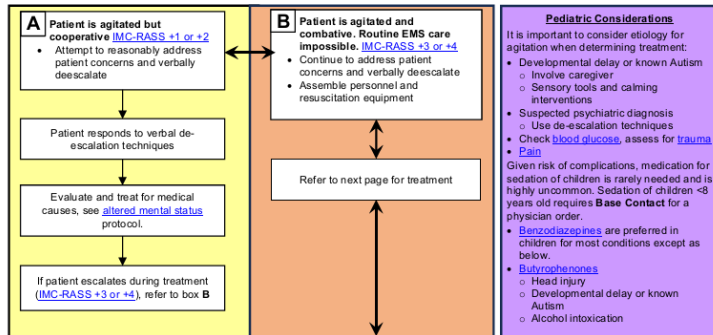
- EMS Safety. The safety of field personnel is paramount. Although EMS personnel have a duty to treat patients experiencing emergency medical conditions, they must not take risks that are threats to safety. Risks to personnel or scene safety should be commensurate to the benefit a patient may receive.
- Patient safety. Patient safety and the aid they receive from our care is the reason EMS exists. All treatments should be designed to reduce potential harm and maximize potential benefit.
- Dignity. All patients and providers deserve dignity and respect. It is essential that EMS professionals recognize our own biases. We owe it to our patients, especially those in disenfranchised groups, to provide equitable care. We strive to maximize the dignity of both patients and providers by practicing with clinical expertise and professionalism.

Initial Assessment:

The most critical initial step in managing agitation is the determination of an emergency medical condition.

- Patients assessed as having non-medical agitation do not require emergency medical intervention. EMS should never intervene solely for the support of another 911 function.
- EMS should only intervene in the medical management of agitation when the patient is assessed and suspected to have an emergency medical condition.
- Prior to any physical restraint or medication administration, all patients must first be assessed and suspected to have an emergent medical condition. Depending on the acuity of the situation, some initial assessments must be made in seconds while others may require more time.
- In some situations, it may be appropriate for EMS to stand by in case a person develops a medical emergency.
- Some patients with emergency medical conditions such as trauma or dyspnea may also exhibit agitation. That agitation should only be treated if the paramedic assesses that the patient lacks decision making capacity to care for their illness or injury.
- As soon as safely possible, EMS providers should assess and treat for underlying conditions that may present as agitation.
- EMS safety is paramount. In some uncommon circumstances it may be necessary to separate from an agitated patient in order to protect the patient and personnel on scene.
- When we have tension between the duty to treat and the safety of field personnel, we should apply the principles of EMS safety, patient safety and dignity.

Treatment: (algorithm color relates to IMC-RASS score)

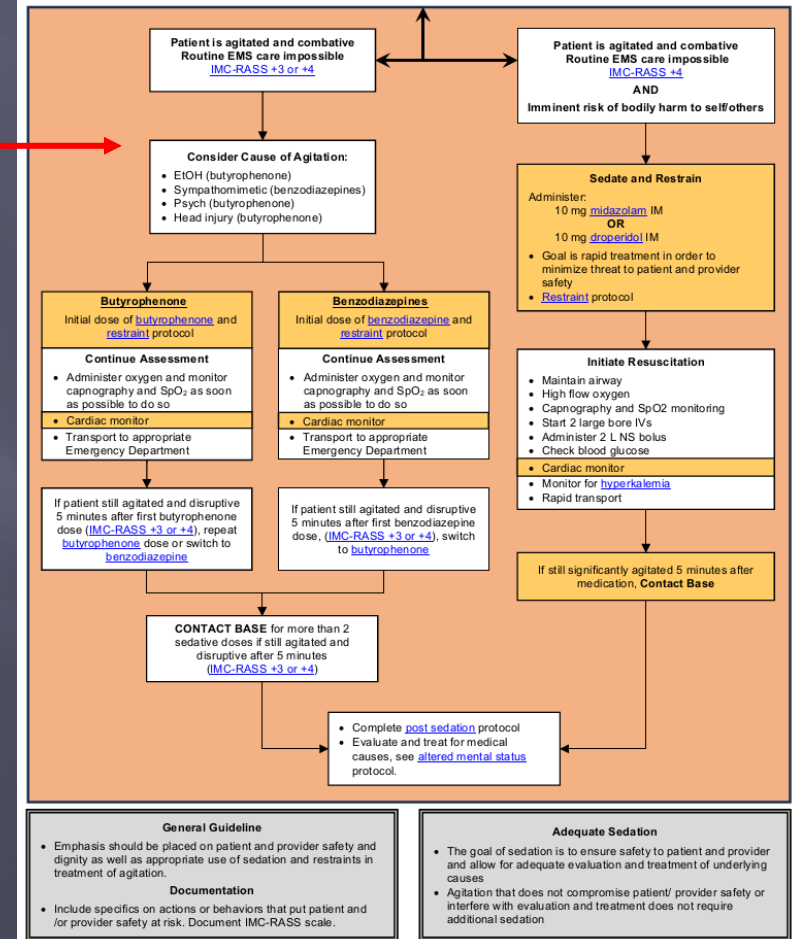


6010 AGITATED/COMBATIVE PATIENT PROTOCOL

Improved Montgomery County Richmond Agitation Sedation Scale (IMC-RASS)

Score	Term	Description	EMS Activity
+4	Combative	Overtly combative, violent, immediate danger to staff	Unsafe to care for patient without maximal assistance, may require law enforcement assistance
+3	Very agitated	Pulls or removes tubes and catheters, aggressive	Struggles aggressively and forcefully against care. Routine EMS care impossible.
+2	Agitated	Frequent, non-purposeful movements, fights interventions	Resists EMS care, requires gentle physical redirection to allow for routine EMS care
+1	Restless	Anxious but movements are not aggressive or vigorous	Verbally redirectable, follows commands, routine EMS care possible
0	Alert and Calm		
-1	Drowsy	Not fully alert but has sustained awakening and eye contact to voice (>10 seconds)	Awakens to voice
-2	Light sedation	Briefly awakens with eye contact to voice (<10 seconds)	Awakens to bumps/potholes in roadway during transport or application of oxygen via NC or NRB
-3	Moderate Sedation	Movement or eye opening to voice (no eye contact)	Eyes open to physical exam, venous tourniquet application and/or BP cuff inflation
-4	Deep Sedation	No response to voice but movement or eye opening to physical stimulation	Responds to insertion of NPA or IV start
-5	Unarousable	No response to voice or physical stimulation	No response to insertion of OPA/NPA or IV start

6010 AGITATED/COMBATIVE PATIENT PROTOCOL



General Guideline

- Emphasis should be placed on patient and provider safety and dignity as well as appropriate use of sedation and restraints in treatment of agitation.

Documentation

- Include specifics on actions or behaviors that put patient and/or provider safety at risk. Document IMC-RASS scale.

Adequate Sedation

- The goal of sedation is to ensure safety to patient and provider and allow for adequate evaluation and treatment of underlying causes
- Agitation that does not compromise patient/ provider safety or interfere with evaluation and treatment does not require additional sedation

6010 Agitated/Combative Patient (pt.2)

6010 AGITATED/COMBATIVE PATIENT PROTOCOL

Principles:

While treating patients experiencing agitation, the safety of EMS providers should be maximized while honoring patient dignity and treating the patient's medical condition in a professional manner.

- **EMS Safety.** The safety of field personnel is paramount. Although EMS personnel have a duty to treat patients experiencing emergency medical conditions, they must not take risks that are threats to safety. Risks to personnel or scene safety should be commensurate to the benefit a patient may receive.
- **Patient safety.** Patient safety and the aid they receive from our care is the reason EMS exists. All treatments should be designed to reduce potential harm and maximize potential benefit.
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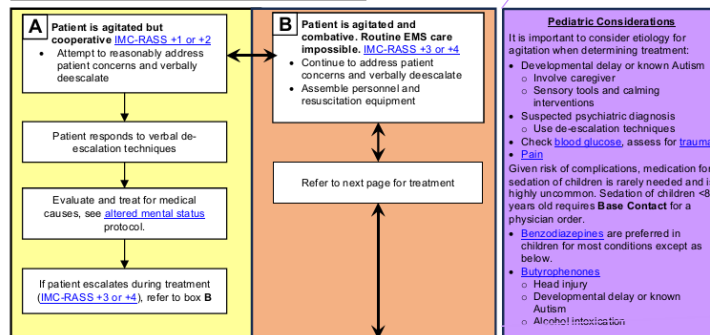
EMT	AEMT
EMT-I	Paramedic

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- As soon as safely possible, EMS providers should assess and treat for underlying conditions that may present as agitation.
- EMS safety is paramount. In some uncommon circumstances it may be necessary to separate from an agitated patient in order to protect the patient and personnel on scene.
- When we have tension between the duty to treat and the safety of field personnel, we should apply the principles of EMS safety, patient safety and dignity.

Treatment: (algorithm color relates to IMC-RASS score)



Pediatric Considerations

It is important to consider etiology for agitation when determining treatment:

- **Developmental delay or known Autism**
 - Involve caregiver
 - Sensory tools and calming interventions
- **Suspected psychiatric diagnosis**
 - Use de-escalation techniques
- **Check [blood glucose](#), assess for [trauma](#)**
- **[Pain](#)**

Given risk of complications, medication for sedation of children is rarely needed and is highly uncommon. Sedation of children <8 years old requires **Base Contact** for a physician order.

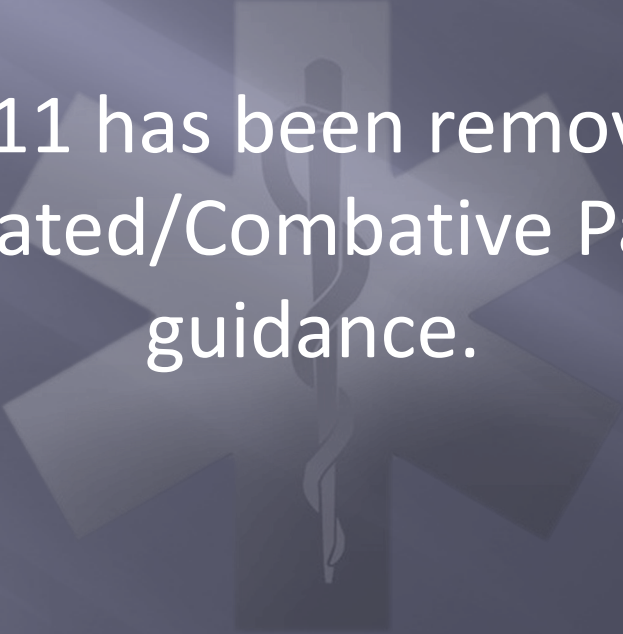
- **[Benzodiazepines](#)** are preferred in children for most conditions except as below.
- **[Butyrophenones](#)**
 - Head injury
 - Developmental delay or known Autism
 - Alcohol intoxication

ADDED:

Pediatric Considerations box

6011 Hyperactive Delirium with Severe Agitation

Protocol 6011 has been removed entirely.
Refer to 6010 “Agitated/Combative Patient Protocol” for
guidance.

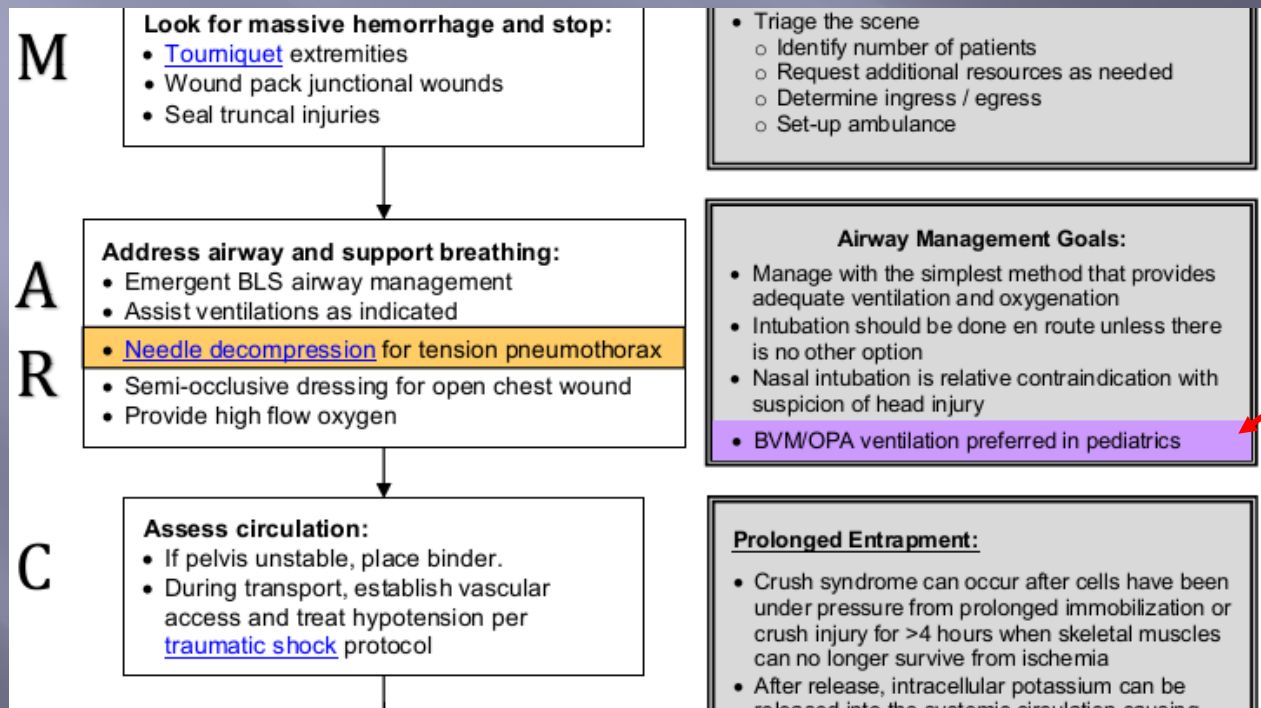


7010 Obstetrical Complications

CHANGED:
Colored magnesium
treatment box for seizures
with eclampsia

<p>Prolapsed Umbilical Cord</p> <ul style="list-style-type: none">• Discourage pushing by mother• Position mother in Trendelenburg or supine with hips elevated• Place gloved hand in mother's vagina and elevate the presenting fetal part off of cord until relieved by physician• Feel for cord pulsations• Keep exposed cord moist and warm	<p>Complications of Late Pregnancy</p> <p>3rd Trimester Bleeding (6-8 months)</p> <ul style="list-style-type: none">• High flow O₂ via NRB, IV access• Suspect placental abruption or placenta previa• Initiate rapid transport• Position patient on left side• Note type and amount of bleeding• IV NS bolus for significant bleeding or shock <p>Pre-eclampsia/Eclampsia</p> <ul style="list-style-type: none">• High flow O₂ via NRB, IV access• SBP > 140, DBP > 90, peripheral edema, headache, seizure• Transport position of comfort• Treat seizures with magnesium sulfate• See seizure protocol
<p>Breech Delivery</p> <ul style="list-style-type: none">• Never attempt to pull infant from vagina by legs• IF legs are delivered gently elevate trunk and legs to aid delivery of head• Head should deliver in 30 seconds. If not, reach 2 fingers into vagina to locate infant's mouth. Press vaginal wall away from baby's mouth to access an airway• Apply gentle abdominal pressure to uterine fundus• IF infant delivered see childbirth protocol – Postpartum care of infant and mother	<p>Shoulder Dystocia</p> <ul style="list-style-type: none">• Support baby's head• Suction oral and nasal passages• DO NOT pull on head• May facilitate delivery by placing mother with buttocks just off the end of bed, flex her thighs
<p>Postpartum Hemorrhage</p>	

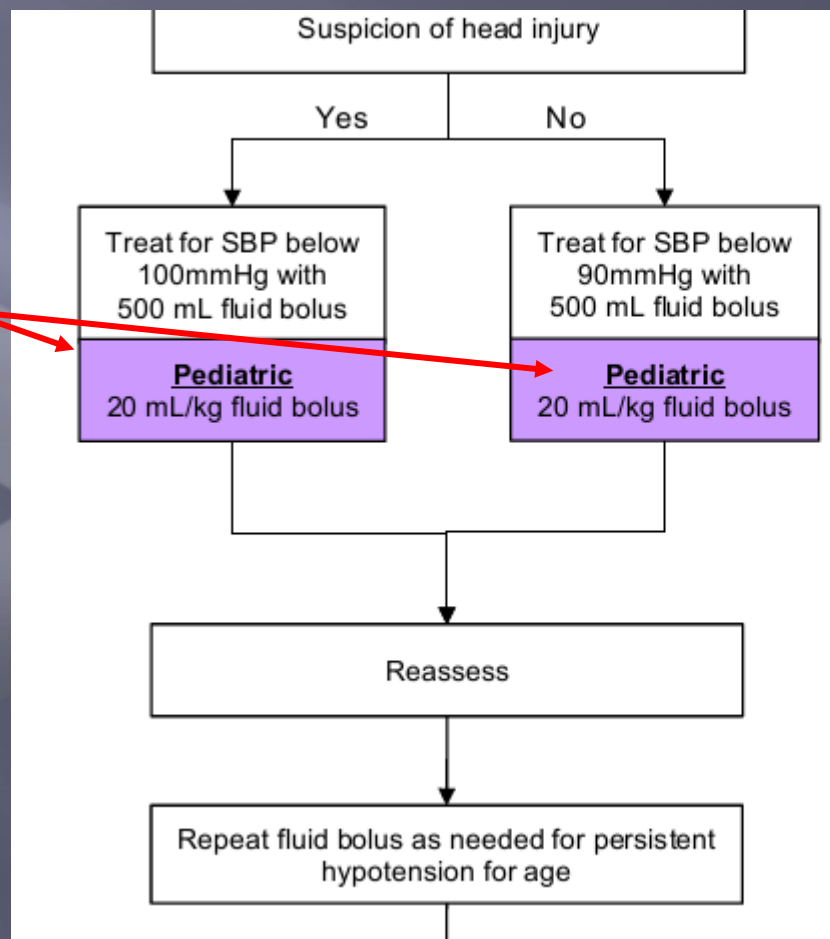
8000 General Trauma Care



CHANGED:
Updated text from
“BLS Airway preferred” to
“BVM/OPA ventilation”

8020 Traumatic Shock

ADDED:
Pediatric fluid bolus
dosing



Consider Non-Hypovolemic Causes

- Other causes of traumatic shock
 - Tension Pneumothorax
 - Pericardial Tamponade
 - Neurogenic
- Treat other causes as indicated (e.g., decompression)
- Rapid treatment and transport to a facility remains priority in all cases of shock

Hypotension for Age

Age	Blood Pressure
<1 year	<70 mmHg
1-10 years	<70 + (2 x age)
>10 years	<90 mmHg
≥65 years	<110 mmHg

Tachycardia for Age

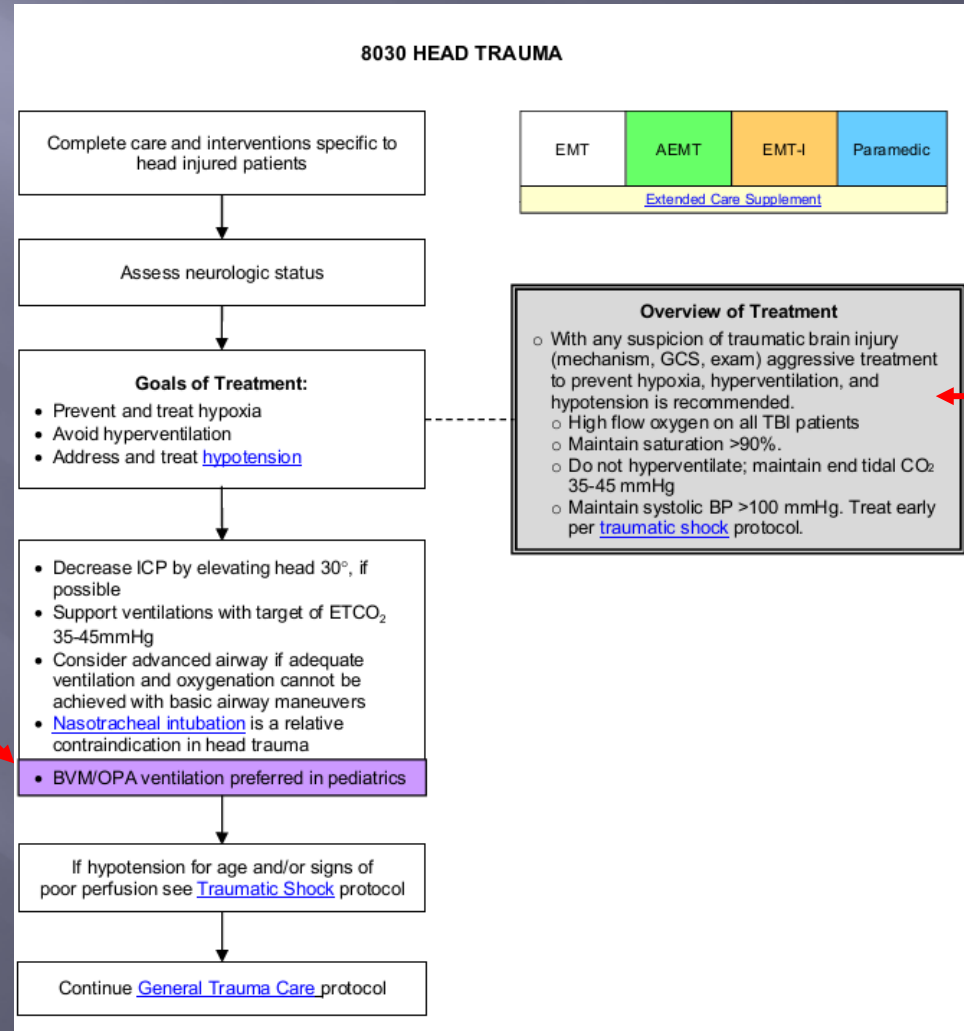
Age	Heart Rate
<1 year	>160 bpm
1-2 years	>150 bpm
2-5 years	>140 bpm
5-12 years	>120 bpm
>12 years	>100 bpm

Pediatric Minimum Blood Pressure

Age	Minimum Systolic Blood Pressure
0-23 months	70 mmHg
2-5 years	80 mmHg
6-8 years	80 mmHg
9-12 years	90 mmHg

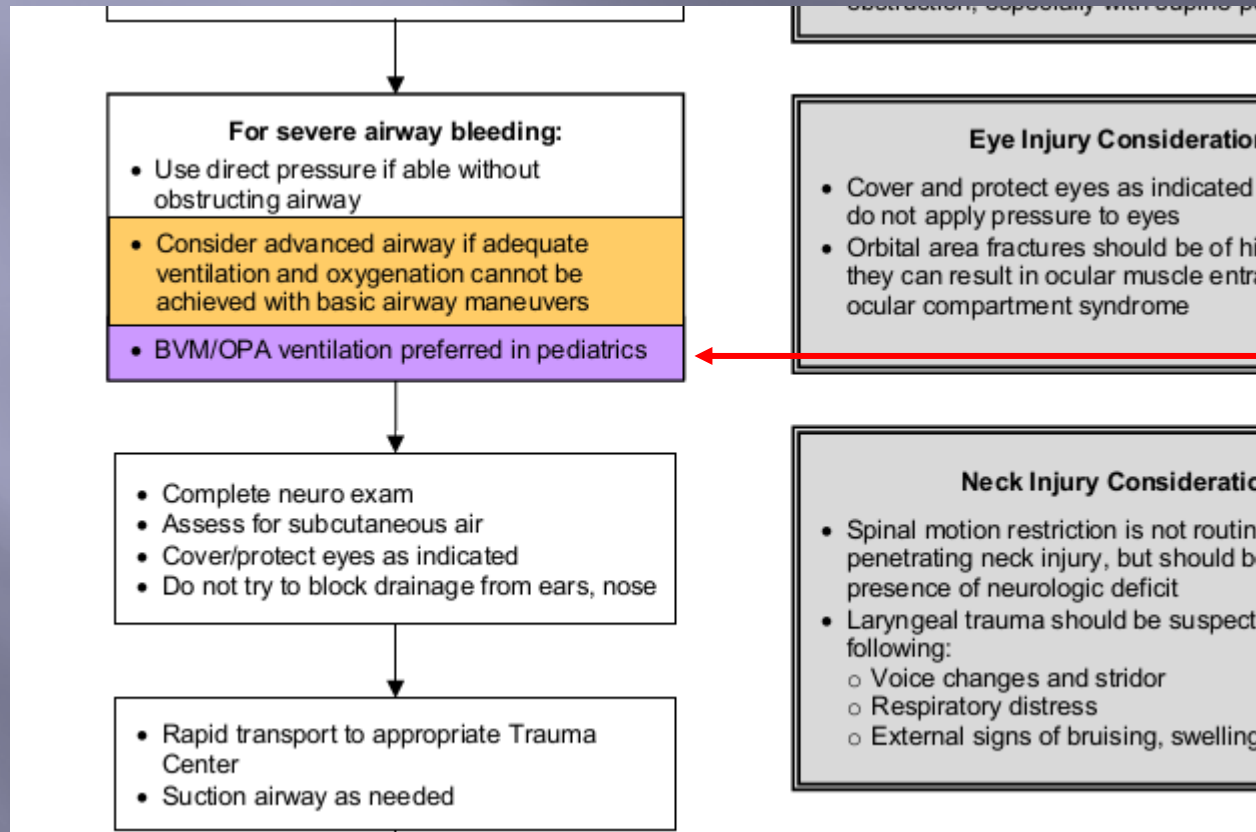
8030 Head Trauma

CHANGED:
Updated text from
“BLS Airway
preferred” to
“BVM/OPA
ventilation”



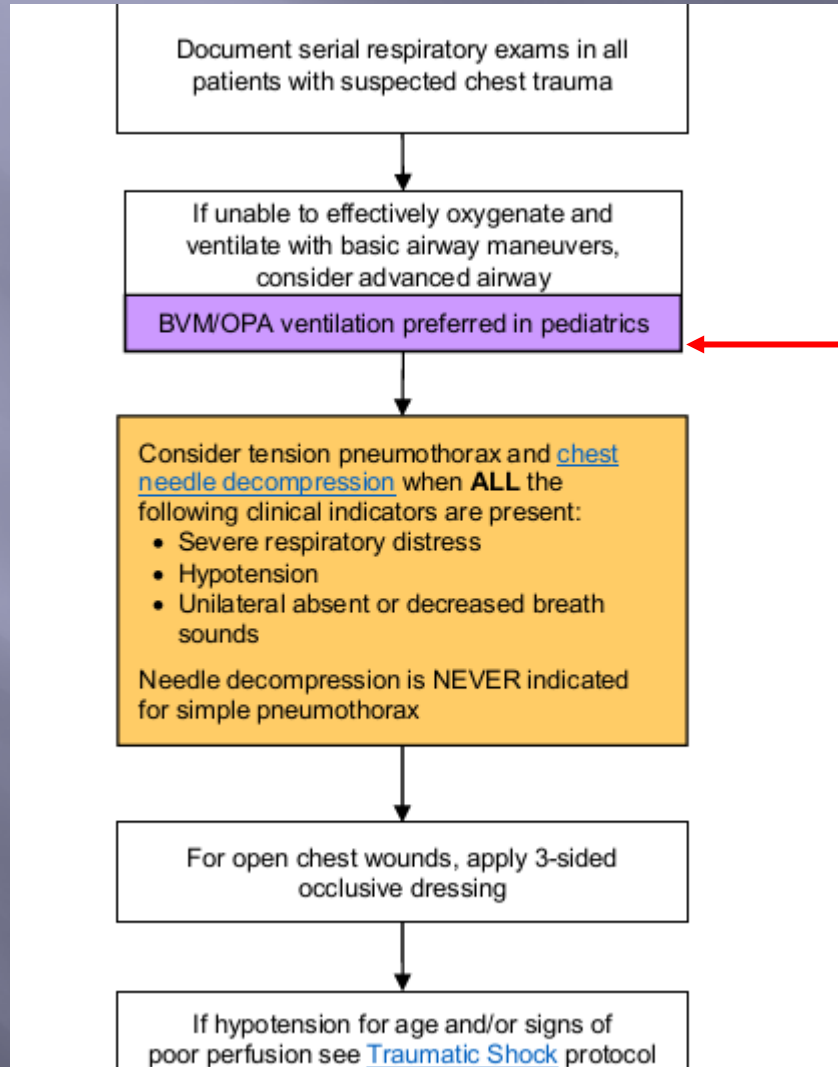
ADDED:
“Gray box” with
information from
the Arizona EPIC
TBI study

8040 Face and Neck Trauma



CHANGED:
Updated text from
“BLS Airway
preferred” to
“BVM/OPA
ventilation”

8060 Chest Trauma



CHANGED:
Updated text from
“BLS Airway preferred” to
“BVM/OPA ventilation”

9070 Benzodiazepines

MIDAZOLAM

Removed references
to “Hyperactive
Delirium”

Patient is agitated and combative, routine EMS care impossible, and IMC-RASS +3 or +4

Adult:

IV/IO/IM route: 5 mg

- If patient still agitated and disruptive 5 minutes after first benzodiazepine dose, (IMC-RASS +3 or +4), switch to [butyrophenone](#)
- If additional sedation medication needed **Contact Base**

Pediatric 8 to 11 years old:

IV/IO/IM route: 0.1 mg/kg; maximum single dose of 5 mg.

Age (years)	LBT color	Estimated Weight (kg)	Midazolam Dose (mg)
8-9	Orange	27-34	2.5 mg
10	Green	35	2.5 mg
11	Green	40	5 mg

Pediatric <8 years old:

- **Contact Base.**

ADDED:

Updates to pediatric
dosing for midazolam
and lorazepam

LORAZEPAM

Patient is agitated and combative, routine EMS care impossible, and IMC-RASS +3 or +4

Adult:

IV/IO/IM route: 2 mg

- If patient still agitated and disruptive 5 minutes after first benzodiazepine dose, (IMC-RASS +3 or +4), switch to [butyrophenone](#)
- If additional sedation medication needed **Contact Base**

Pediatric 8 to 11 years old:

IV/IO/IM route: 0.05 mg/kg; maximum single dose of 2 mg.

Age (years)	LBT color	Estimated Weight (kg)	Lorazepam Dose (mg)
8-9	Orange	27-34	1 mg
10	Green	35	2 mg
11	Green	40	2 mg

9075 Butyrophenones

DROPERIDOL

Removed references
to “Hyperactive
Delirium”

CHANGED/ADDED:
Updated pediatric
max dosing

DROPERIDOL:
Patient is agitated and combative, routine EMS care impossible, and (IMC-RASS +3 or +4)

Adult:
IV/IM route: 5 mg slow IV or IM administration.

- If patient still agitated and disruptive 5 minutes after first butyrophenone dose (IMC-RASS +3 or +4), repeat butyrophenone dose or switch to benzodiazepine
- If additional sedation medication needed **CONTACT BASE**

Pediatric 8 to 11 years old:
IV/IO/IM route: 0.025 mg/kg; **maximum single dose of 1.25 mg.**

Age (years)	LBT color	Estimated Weight (kg)	Droperidol	
			Dose (mg)	2.5 mg/mL Vol (mL)
8-9	Orange	27-34	0.625 mg	0.25 mL
10-11	Green	35-40	1.25 mg	0.5 mL

Pediatric <8 years old:
• Not indicated. Refer to [benzodiazepines](#).

ADDED:
Updates to pediatric
dosing for droperidol
and haloperidol

HALOPERIDOL

HALOPERIDOL:
Patient is agitated and combative, routine EMS care impossible, and IMC-RASS +3 or +4

Adult:
IM route: 5 mg IM

- If patient still agitated and disruptive 5 minutes after first butyrophenone dose (IMC-RASS +3 or +4), repeat butyrophenone dose or switch to benzodiazepine
- If additional sedation medication needed **CONTACT BASE**

Pediatric 8 to 11 years old:
IM route: 0.05 mg/kg; **maximum single dose of 2.5 mg.**

Age (years)	LBT color	Estimated Weight (kg)	Haloperidol	
			Dose (mg)	5 mg/mL Vol (mL)
8-9	Orange	27-34	1.5 mg	0.3 mL
10-11	Green	35-40	2.5 mg	0.5 mL

Pediatric <8 years old:

9080 Calcium

- Doses below refer to dose of calcium solution, not elemental calcium.

Indications

- Adult pulseless arrest associated with any of the following clinical conditions:
 - Known or suspected hyperkalemia
 - Renal failure with or without hemodialysis history
 - Calcium channel blocker overdose
 - **Not indicated for routine treatment of pulseless arrest**
- Renal failure with known or suspected hyperkalemia
- **Known or suspected hyperkalemia with ECG changes**
- Crush or suspension injury with known or suspected hyperkalemia
- Calcium channel blocker overdose with hypotension and bradycardia

Contraindications

ADDED:
Indications – “Known or suspected hyperkalemia with ECG changes”

ADDED:
Side Effects/Notes – added language to flush line if using the same line to administer sodium bicarb

Side Effects/Notes

- Extravasation of calcium chloride solution may cause tissue necrosis.
- Because of the risk of medication error, if calcium chloride is stocked, consider limiting to 1 amp per medication kit to avoid accidental overdose. Calcium gluconate solution will require 3 amp supply for equivalent dose.
- **If administering in same IV/IO line with sodium bicarbonate, flush IV/IO line with at least 10 mL of fluid between medications.**
- In setting of digoxin toxicity, may worsen cardiovascular function.

9120 Epinephrine

Adult Push Dose:

- Refer to agency-specific guideline for ~~mixing instructions~~, as dosing error is common.
- Administer IV push of 10-20 mcg aliquots every 1-5 minutes as needed

Adult Infusion:

Adult Infusion Drip Rate Chart Reference

Drip Rate Chart (1 mcg/mL)		
Dose (mcg/min)	10 gtt/mL Drip Set	15 gtt/mL Drip Set
2	20 gtt/min	30 gtt/min
3	30 gtt/min	45 gtt/min
4	40 gtt/min	60 gtt/min
5	50 gtt/min	75 gtt/min
6	60 gtt/min	90 gtt/min
7	70 gtt/min	105 gtt/min
8	80 gtt/min	120 gtt/min
9	90 gtt/min	135 gtt/min
10	100 gtt/min	150 gtt/min

CHANGED:

Throughout - Removed "1:1000" ratio and updated to just "1mg/ml"

ADDED:

Drip Rate Chart Reference added to bottom of protocol

CHANGED:

Significant changes to the Adult Push Dose area, with mixing instructions being agency-specific, removal of concentrations, and update to dosing range.

9225 NSAIDS

ADDED:
Ketorolac pediatric dosing
for 8-11 year olds

500 mg PO

Pediatric:
10 mg/kg PO – **SEE CHART**

Ketorolac

Adult:
15 mg IV or IM

Pediatric 8-11 years old:
10 mg IV or IM

Pediatric <8 years old:
Not indicated

Protocol

- [Pain management](#)

9270 RACEMIC EPINEPHRINE

CHANGED:

In Special Considerations -
Removed “1:1000” ratio
and updated to just
“1mg/ml”

Special Considerations

- Racemic epinephrine is heat and photo-sensitive
- Once removed from the refrigerator, the unopened package is stable at room temperature until the expiration date stated on the package.
- Do not confuse the side effects with respiratory failure or imminent respiratory arrest.
- If no racemic epinephrine is available, consider 5 mL of 1mg/mL epinephrine x 1 via nebulizer at 6-8 LPM to create a fine mist and administer over 15 minutes.

9280 SODIUM BICARBONATE

REMOVED/CHANGED:

Indications – removed hyperactive delirium reference, and updated with hyperkalemia and ECG changes information

ADDED:

Indications – TCA information to Sodium Channel Blocker line

Indications

- Suspected hyperkalemic pulseless arrest: consider in patients with known renal failure/dialysis.
- Renal failure with known or suspected hyperkalemia
- Known or suspected hyperkalemia with ECG changes
- Crush or suspension injury with known or suspected hyperkalemia
- Sodium bicarbonate therapy is indicated in patients with sodium channel blocker poisoning who develop widening of the QRS interval >120 msec, hypotension, or a ventricular arrhythmia.
 - Examples of sodium channel blockers include tricyclic antidepressants (TCA) such as amitriptyline, also other medications like diphenhydramine, phenytoin, lidocaine, procainamide, or carbamazepine.

ADDED:

Interactions – added content to flush line if using the same line to administer calcium

Drug Interactions

- If administering in same IV/IO line with calcium, flush IV/IO line with at least 10 mL of fluid between medications.
- Alkalinization of urine may increase half-lives of certain drugs.
- Vasopressors may be deactivated.

9000X EXTENDED CARE SUPPLEMENT

1. ~~Mix.~~ Inject amount of epinephrine into normal saline size bag per table below to achieve 1mcg/mL concentration. Use macro drip set for infusion.

Normal Saline Volume	Epinephrine Amount	Epinephrine 1mg/mL Concentration Amount	Epinephrine 0.1mg/mL Concentration Amount
1000 mL	1 mg	1 mL	10 mL
500 mL	0.5 mg	0.5 mL	5 mL
250 mL	0.25 mg	0.25 mL	2.5 mL

CHANGED:

In the table for mixing instructions- Removed "1:1000" ratio and updated to just "1mg/ml"

Resources

- ▣ Arizona EPIC-TBI Project Page - <https://epic.arizona.edu/>

