LMHS Protocols

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Lima Memorial
HEALTH SYSTEM

Affiliate of ProMedica

Responsoft®
EMS Protocols
www.responsoft.com

Different fields...Same Goal!

Signature Page

The preceding protocols are approved as listed.

3-29-2023
Effective Date

Todd Brookens, DO, FACEP, FAAEM
EMS Medical Director
Lima Memorial Health System

Doug LaRue
DOUG LaRUE
Notary Public, State of Ohio
My Commission Expires
3-11-2024

Responsoft EMS Protocols 2

Letter From Medical Director Part A

Introduction:

You have in your hands (or on your computer screen) the protocol document which describes the methods whereby Fire Departments and EMS Units operating under the medical direction of Lima Memorial Health System will provide high quality pre-hospital medical care. The document is exhaustive; however, we are not able to write a protocol or policy for every situation you may encounter in the pre-hospital environment and as such, they provide a guideline for treating the majority of situations presented to you. Additionally, On-Line Medical Control is always available for your consultation.

Foundations:

Definition of a Patient:

A patient is an individual requesting or potentially needing medical evaluation or treatment. A patient-provider relationship is established via telephone, radio, or personal contact. It is your responsibility to ensure all potential patients are offered the opportunity for evaluation, treatment, and/or transport.

Rights of a Patient:

Once you have begun collecting information about a patient encounter, you have an ethical obligation to protect a patient's confidential information. It is important to take every opportunity to protect patient confidentiality. This applies to written as well as spoken communications.

Competent patients have the right to accept or refuse medical care, even if the consequences of the refusal of care may potentially be harmful for the patient. In the event that a patient refuses care, it is important to remember the following:

1) Be courteous
2) Offer transport without some or all of the recommended treatment if the patient will allow that. Document the patient's wishes
3) Clearly advise the patient of the possible complications of their decision
4) Advise the patient to call 911 if they subsequently desire treatment and transport
5) Accurately document all components of the patient encounter

Regarding CONSENT:

1) Minors:
    a) Patients under the age of 18 may not consent to medical treatment or transport. However, the following may consent for the treatment of a minor
        i) Mother or Father
        ii) Legal Guardian
        iii) An individual standing in *loco parentis.* Such persons may include a stepparent taking the responsibilities of a parent of the child.
        iv) The leader of a group of children in possession of written permission from the parent authorizing emergency medical treatment (i.e. a school field trip, etc)

b) No consent required in the following circumstances prior to initiating treatment:
   i) The patient, guardian, or person standing in *loco parentis* cannot be reached and the minor needs to receive medical treatment.
   ii) The identity of the child is unknown and a delay in giving treatment would endanger the life of the child.
   iii) The effort to contact the child's parents, guardian, or person standing in *loco parentis* would result in a delay that would seriously worsen the condition of the child.

c) A minor may consent to treatment without the knowledge of a parent in the following circumstances:
   i) Pregnancy
   ii) Treatment of STD's
   iii) Alcohol or drug abuse iv) Emotional disturbance

2) Life threatening situations without the ability to communicate:
   a) A patient of any age who is unable to communicate because of an injury, accident, illness, or unconsciousness and is suffering from what reasonably appears to be a life-threatening injury or illness should be treated under the principle of ***implied consent***.
   b) The principle of implied consent presumes that if the individual with the illness or injury were able to communicate, he or she would consent to the emergency treatment.
   c) In these situations, patients may be transported without their consent. Law enforcement, physical and/or chemical restraint may be required.

3) Potentially life-threatening situations:
   a) Patients usually present in one of two situations: the alert patient who has a concerning presentation and refuses treatment and/or transport or the patient is intoxicated but does not have what reasonably appears to be a life-threatening injury. In these situations, the following steps should be taken:
      i) Determine orientation to person, place, and time. Document.
      ii) Determine what factor(s) is/are influencing the patient to refuse medical care. Resolve those in your power (i.e. transport without an IV).
      iii) Attempt communication with spouse/significant other or family members.
      iv) If patient continues to refuse, consider On-Line Medical Control or contact the medical director.
      v) If patient continues to refuse care, clearly explain risks of refusal and have patient repeat those to you. Document. vi) Assure patient they can call back for treatment and transport at any time.

Automatic notification of the Medical Director

Events that may potentially have a negative impact on patient care must be reported to the Medical Director immediately. Notification may be made by directly contacting the Medical Director at (419) 346-9444. These events include the following:

1) Cardiac arrest or respiratory arrest after administrations of any sedative or analgesic
2) Cardiac arrest after administering an anti-arrythmic agent in a previously stable patient
3) Any attempt at surgical airway
4) Incorrect medication administration with patient complication
5) Any cardiac or respiratory arrest or patient injury related to use of physical or chemical restraints
6) Provider operating outside of scope of practice as defined by the State of Ohio and by the provider's approved level of practice within the system
7) Needle decompression of the chest
8) Intubation attempts >3
9) Unrecognized esophageal intubation or complication related to advanced airway management

Disclaimer: Certain medications and/or medical devices listed in the LMHS EMS protocols may not be available to or used by all departments utilizing LMHS medical direction due to financial considerations/limitations and/or certification level or training.

These policies, procedures, and protocols provide a foundation for providing the best possible patient care to those we encounter in the pre-hospital environment. The way we conduct ourselves in a professional manner is as important as the care we render to the citizens we serve.
I am happy to provide medical direction to your agency.

Sincerely,
Todd Brookens, DO, FACEP
Medical Director
Lima Memorial Health System
Emergency Medical Services

Legend

General — General Information

EMR — **Emergency Medical Responder**

EMT — **Emergency Medical Technician** Scope of Practice

AEMT — **Advanced Emergency Medical Technician**

Paramedic — **Paramedic** Scope of Practice

Med Control — **Medical Control**

Bold Black Boxes contain important information

All Drugs color coded in **Dark Green**. Example: **Atropine**

Calculated Drugs are **Blue**. Example: **125 mg**

Important Note:

Pharmacology Section: ***Indications***. This links where particular medication will be found in the protocol.

Notes for Future Protocol Changes

(Sticky Notes)

Table of Contents, Page 1

Table of Contents, Page 2

Table of Contents, Page 4

Universal Patient Care

Adult Assessment

Scene Safety & BSI (body substance isolation)

Bring all necessary equipment to patient's side

Demonstrate professionalism and courtesy

PPE (consider airborne or droplet precautions)

Initial Assessment

BLS: Consider Spinal Motion Restriction

For pediatrics, use Broselow Tape

Cardiac Arrest → **Cardiac Arrest** Protocol

Adult Airway Protocol

Consider **Pulse Oximetry**

Supplemental **Oxygen**

Vital Signs

Temperature and Blood Glucose

As indicated

Consider:

Cardiac monitor / **12 Lead ECG**

Appropriate Protocol

Transport patient per

Patient Transport Policy

Patient doesn't fit a protocol?

Contact **OLMC**

Pearls

- Any patient contact that does not result in transport requires documentation and disposition
- Required vital signs on every patient include BP, pulse, RR, pain/severity
- Pulse oximetry, glucose measurement and temperature documentation is dependent on complaint
- Timing of transport based on patient's clinical condition
- If an ALS assessment has been performed and it is documented in the Patient Care Report that the Patient requires no further Advanced Interventions or assessments, then a BLS provider may accompany the patient during transport, so long as all appropriate care is taken to ensure patient care is never jeopardized.

Patient Safety

Adult Assessment

Follow: **Universal Patient Care**

Utilize pre-printed drug dose cards.
For weight based drug dosing, verify correct drug and dose before administration

Document once per shift presence of all equipment, meds, and supplies

If supplies fall below required levels, restock. If dispatched to call requiring depleted supplies, respond and call for backup

For massive depletion of supplies and/or contamination, remain out of service until resupplied and clean; Unless disaster scenario

For equipment failure, utilize equipment failure procedure and complete "Unusual Event Report"

For medication error, clinical misadventure, or other adverse patient outcome, contact medical director

Appropriate protocol

Transport patient per patient transport policy

Patient doesn't fit a protocol?
Contact OLMC

Pearls Exam: Mental status, skin, neck, heart, lungs, abdomen, back, extremities, neuro - For witnessed/monitored VT, have patient cough or deliver precordial thump - Torsades de Pointes may benefit from Magnesium Sulfate 2g IV - For presumed hyperkalemia (ESRD, dialysis) administer 1 amp Sodium Bicarbonate

General
EMR
EMT
AEMT
Paramedic
Med Control

Police Custody

Adult Assessment

History
- Traumatic injury
- Drug abuse
- Cardiac history
- Asthma?
- Psych history

Signs and Symptoms:
- External signs of trauma
- Palpitations
- SOB
- Wheezing
- Altered mental status
- Intoxication/substance abuse

Differential:
- Agitated delirium secondary to psychiatric illness
- Agitated delirium secondary to substance abuse
- Traumatic injury
- Closed head trauma
- Asthma exacerbation
- Cardiac dysrhythmia

General

Universal Patient Care

Traumatic injury or medical illness

Yes → Appropriate protocol

EMR

No

Use of pepper spray or taser?

EMT

Pepper spray

Irrigate face/eyes
remove contaminated clothing

Wheezing?

Respiratory Distress Protocol and transport

Taser

Significant injury from taser entry point or from fall after taser use?

AEMT

Cardiac history with pacemaker, chest pain or palpitations?

Yes

No

Yes

Paramedic

Behavioral Emergency

Yes → Consider restraint procedure and/or chemical restraint

No

Coordinate disposition with patient and law enforcement

Go to: **Behavioral Emergency**

Med Control

Pearls

Agitated Delirium = marked restlessness, irritability, and/or high fever. These patients are at risk for sudden death

- Patients restrained by law enforcement devices cannot be transported in the ambulance without a law enforcement officer in the patient compartment who is capable of removing the device
- If there is any doubt about the cause of the patient's altered mental status, transport to hospital
- All patients in police custody retain the right to request transport

Asystole

Adult Cardiovascular

History
- Past Medical History
- Medications
- Events
- End stage renal failure
- Estimated downtime
- Hypothermia?
- Overdose?
- DNR?

Signs and Symptoms:
- Pulseless
- Apneic
- No electrical activity on ECG
- No auscultated heart tones

Differential: (H's and T's)
- Medical or Trauma
- Hypoxia
- Potassium (hypo/hyperkalemia)
- Overdose
- Acidosis
- Hypothermia
- Device error - check leads
- Death

H's and T's
- Hydrogen Ion (acidosis)
- Hypovolemia
- Hypothermia
- Hypoglycemia
- Hyperkalemia
- Overdose (narcotics, tricyclics, calcium channel blocker, beta blocker
- Tension pneumothorax

Universal Patient Care

Cardiac Arrest Protocol

- Use Automated CPR Device if available
- Avoid interruptions
- Use *=Supraglottic Airway = iGel or King LT
- Avoid overventilation
- Use continuous End Tidal CO_2 monitoring

Adult IV/IO Protocol

Epinephrine 1 mg/10 mL 1 mg IV, IO
Repeat every 3 - 5 minutes

Identify/correct causes of asytole

Continue **Epinephrine**

AT ANY TIME
ROSC
(Return of Spontaneous Circulation)

Go to: **Post Resuscitation** Protocol

Criteria to discontinue??
Contact On Line Medical Control to cease efforts If approved, leave body at scene with police. Leave medical devices used in place (ETT, IO, needle decomp, SGA)

Pearls: *=Supraglottic Airway = iGel or King LT
- Always confirm asystole in more than one lead
- Always address correctable causes

General
EMR
EMT
AEMT
Paramedic
Med Control

Atrial Fibrillation

Adult Cardiovascular

History
- Medications (theophylline, diet pills thyroid, decongestants, digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past Medical History
- Palpitations
- Syncope

Signs and Symptoms:
- HR > 160/min (varies)
- QRS < 0.12 sec
- Dizziness, CP, Dyspnea
- Possible rhythms:
  - Sinus tach
  - Atrial fib/atrial flutter
  - Multifocal atrial tachycardia

Differential:
- Heart disease (WPW, Valvular)
- Sick Sinus Syndrome
- MI
- Electrolyte imbalance
- Exertion, pain, emotional stress
- Fever
- Hypoxia
- Hypovolemia/anemia
- Overdose
- Hyperthyroidism
- PE

Universal Patient Care

V-Tach w/Pulse Protocol ← Hx of WPW / WPW on ECG — **Adult IV/IO** Protocol

Symptomatic (Chest Pain, Altered Mental Status)

12 Lead ECG

Diltiazem (Cardizem)
0.25 mg/kg IVP over 5 - 10 minutes
Maximum 20 mg

If unsuccessful after 15 min,
Diltiazem (Cardizem) 0.35 mg/kg
over 5-10 min **Maximum 20 mg**

After conversion
12 Lead ECG

Pre-arrest (no palpable BP, Severely altered mental status)

Consider sedation for cardioversion
Midazolam (Versed) 2 - 5 mg IVP
or
Ketamine (Ketalar) 0.2 mg/kg IVP, IN, IM

Synchronized **Cardioversion** 100 J
x1 then 360 J Repeat PRN

Diltiazem (Cardizem)
0.25 mg/kg IVP over 5 - 10 minutes
Maximum 20 mg

If unsuccessful after 15 min,
Diltiazem (Cardizem) 0.35 mg/kg
over 5-10 min **Maximum 20 mg**

After conversion
12 Lead ECG

Pearls
Exam: Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neuro
- Monitor for hypotension after diltiazem administration
- Monitor for respiratory depression/hypotension with midazolam
- Continuous pulse-oximetry required
- Document all effects of therapy/rhythm changes

Bradycardia

Adult Cardiovascular

History
- Past medical history
- Medications
  - *Beta-blocker
  - *Calcium channel blocker
  - *Clonidine
- *Digoxin
- Events
- Pacemaker

Signs and Symptoms:
- HR < 60 bpm
- Chest pain
- Hypotension or shock
- Altered mental status
- Syncope

Differential:
- MI
- Hypoxia
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury
- CVA
- Spinal cord injury
- Sick sinus syndrome
- AV block
- Overdose

Universal Patient Care

12 Lead ECG

Adult IV/IO Protocol
Fluid Bolus as needed

"Signs of poor perfusion"
Cool, clammy, altered, hypotension,

Atropine 0.5 – 1 mg IVP, IO
Maximum 3 mg

External **Transcutaneous Pacing**

Consider sedation with
Midazolam (Versed) 2 mg IVP, IO
or
Ketamine (Ketalar) 0.2 mg/kg IVP, IN, IM

Epinephrine IV infusion:
2 - 10 mcg/min

Pearls Exam: Mental status, neck, heart, lungs, neuro
- Use of lidocaine in heart block can worsen bradycardia and lead to asystole or death
- Pharmacologic treatment of bradycardia is based on presence or absence of symptoms
- If symptomatic, Treat
- If asymptomatic, Monitor only
- Consider treatable causes for bradycardia: i.e. beta or calcium channel blocker OD
- Remember to oxygenate and support ventilatory effort

Cardiac Arrest

Adult Cardiovascular

History
- Events
- Downtime
- Past medical history
- Medications
- Terminal illness
- Lividity, rigor mortis
- DNR

Signs and Symptoms:
- Unresponsive
- Apneic
- Pulseless

Differential:
- Medical vs. Traumatic
- VF or Pulseless VT
- Asystole
- PEA

Universal Patient Care
PIT CREW approach

AT ANY TIME
ROSC (Return of Spontaneous Circulation)
Go to **Post Resuscitation** Protocol

Criteria for Death / no resuscitation?

Begin continuous compressions
Do not interrupt compressions for airway placement

Advanced Life Support Available?

BLS

AED Procedure

Adult Airway

Avoid interruptions in compressions
Ventilate no more than 8 - 10 breaths Minute.

ALS

- Do not interrupt chest compressions
- SGA/Intubate (*VL=video laryngoscopy or DL= Direct laryngoscopy) IV or IO
- Waveform capnography
- Defibrillate once $EtCO_2$ is above 20 mmHg
- Follow **VF/VT** / **Asystole** / **PEA** protocol

Pearls
Exam: Mental status

ALWAYS FOLLOW CURRENT ACLS GUIDELINES

Success based on proper planning and execution; Pit Crew Approach to arrest. Assure adequate space and patient access.
No ventilations for first 2 cycles of CPR (4 minutes) use OPA and NRB mask; position airway
Maternal arrest→Treat mother per appropriate protocol with immediate notification of medical control and rapid transport.
Adequate compressions and timely defibrillation are keys to success.

Chest Pain

Adult Cardiovascular

History
- Age
- Medications
- Erectile dysfunction meds?
- Past medical history
- Diabetes
- Allergies
- Onset
- Palpitation/provocation
- Quality
- Region/radiation/referred
- Severity
- Time (duration)

Signs and Symptoms:
- Chest pain
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

Differential
- Trauma vs. Medical
- Acute coronary syndrome vs. MI
- Pericarditis
- PE - Asthma/COPD
- Pneumothorax
- Aortic dissection
- GE Reflux, hiatal hernia
- Esophageal spasm
- Chest wall pain
- Pleural pain
- Overdose (cocaine)

General

Universal Patient Care

Aspirin 325 mg PO
Unless allergy to ASA,

EMR

12 Lead ECG

STEMI on 12-Lead
Transport to closest PCI facility.
Transmit ECG if able

Nitroglycerin 0.4 mg tablet /spray
Every 5 minutes if SBP > 90

*** If the patient has their own supply ***EMTs may assist the patient with Nitroglycerin 0.4 mg SL Every 5 minutes if SBP > 90

EMT

Adult IV Protocol

IV **Fluid Bolus** for Inferior MI (volume dependent)

AEMT

May assist with:
1. Patient's prescription upon patient request and with written protocol.
OR
2. EMS-provided medications with verbal online medical direction.

Continued pain
Fentanyl (Sublimaze) 25 – 100 mcg IVP, IN

Paramedic

Nitroglycerin 0.4 mg (tablet/spray)
Every 5 minutes if SBP > 90

Hypotension/arrhythmia
Treat per protocol

For nausea/vomiting, consider
Ondansetron (Zofran) 4 mg IV, IM, ODT

Ondansetron (Zofran)
4 mg ODT

Med Control

Pearls
Exam: Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Avoid NTG in patient who has used erectile dysfunction meds (Viagra, Levitra, Cialis, etc .) in past 24 hours
- If patient has STEMI, establish 2nd IV
- Monitor for hypotension after NTG and/or Fentanyl administration

Remember - diabetics, geriatric and female patients often have atypical symptoms

Hypertension

Adult Cardiovascular

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

Signs and Symptoms:
- Systolic BP > 200
- Diastolic BP > 120

Plus
- Headache
- Nosebleed
- Blurred vision
- Dizziness

Differential:
- Hypertensive encephalopathy
- CNS injury
  Cushing response = bradycardia
  With hypertension
- MI
- Aortic dissection
- Pre-eclampsia/Eclampsia

Universal Patient Care

Check BP in both arms

12 Lead ECG

Adult IV/IO **Protocol**

Hypertension + End-organ damage
1) Acute coronary syndrome
2) STEMI
3) Acute renal failure

Administer **Nitroglycerin** Spray sublingual every 5 minutes until Blood Pressure is 140/90 mmHG

Hypertension + End-organ damage
1) Acute coronary syndrome
2) Acute MI
3) Acute renal failure
4) **DO NOT ACUTELY LOWER BLOOD PRESSURE IN SUSPECTED STROKE**

Labetalol (Trandate) 20 mg IVP (avoid with bradycardia); May repeat x 1 in 10 minutes

Pearls
Exam: Mental status, skin, neck, lung,heart, abdomen, back, extremities, neuro
- Never treat elevated blood pressure based on one set of vital signs
- Symptomatic hypertension is usually revealed through end-organ damage to cardiac, CNS, or renal systems
- Transport symptomatic patients with hypertension with their head elevated

Hypotension/Shock Non-Trauma

Adult Cardiovascular

History
- Blood loss: GI, AAA, Ectopic, Vaginal
- Fluid loss - Vomiting, diarrhea, fever
- Infection
- Cardiac: ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- Poor PO intake history

Signs and Symptoms:
- Restless, confused
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential:
- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- PE
- Tension pneumothorax
- Medications/OD
- Vasovagal
- Physiologic

Universal Patient Care

Adult IV/IO

Observe and reassess

No

Symptomatic

Cardiac

Treat per appropriate cardiac protocol

No rales present
Normal saline
500 ml bolus

Trauma

Treat per appropriate trauma protocol

Non-cardiac
Non-trauma

Normal saline
20 ml/kg bolus

Additional normal saline
20 ml/kg bolus if no response

The following require large bore IV

Norepinephrine (Levophed) 0.1 - 0.5 mcg/kg/min

IV **Epinephrine** 0.1 - 0.5 mcg/kg/min

IV **Dopamine (Intropin)** 5 - 10 mcg/kg/min IV to get MAP to >65

Interfacility Transports Only – NOT for routine prehospital use

Epinephrine Push Dose

Mix 1 mL Epinephrine

(1 mg/10 mL) with 9 mL Normal Saline and mix syringe

give 1-2 mL (10 - 20 mcg) every 3 minutes until MAP >65

General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls
Exam: Mental status, skin, heart, lungs, abdomen, back, extremities, neuro
- Hypotension = SBP < 90 mmHg
- Consider orthostatic vital signs on non-trauma patients with suspected blood or fluid loss
- Consider all causes of shock and treat per protocol
- Norepinephrine= Levophed. ***Use only in patients not responsive to Saline Bolus therapy***; Must have large bore IV
- Monitor closely for extravasation; IV pump preferable. 4 mg ampule in 1000 ml Dextrose = 4 mcg/ml

Post Resuscitation

Adult Cardiovascular

History
- Respiratory arrest
- Cardiac arrest

Signs and Symptoms:
- Return of pulse (ROSC)

Differential:
- Continue to address specific differential with original arrhythmia

Pearls
Exam: Mental status, skin, neck, heart, lungs, abdomen, extremities, neuro
- Avoid hyperventilation
- Most patients post resuscitation will require ventilatory assistance
- Post resuscitation condition of patient changes rapidly
- Consult OLMC as needed regarding management
- Titrate Vasopressors to maintain MAP >60. Ensure adequate fluid resuscitation is ongoing

Repeat primary assessment

Candidate for induced hypothermia?

Monitor $EtCO_2$ (>20 mmHg) with RR < 12/ min. DO NOT HYPERVENTILATE

Adult IV Protocol

Non-cardiac Non-trauma

Hypotension?

Monitor ECG, vitals, pulse oximetry, capnometry

Bradycardia?

Administer 1 Liter NS Fluid Bolus

Arrythmia?

Treat per **Bradycardia** Protocol

Go to appropriate protocol

Vasopressors

Norepinephrine (Levophed)

0.1 – 0.5 mcg/kg/min IV

Epinephrine 0.1 - 0.5 mcg/kg/min IV

Dopamine (Intropin) 5 - 10 mcg/kg/min

MAP >65. **Interfacility transfers ONLY**--NOT for routine prehospital use

Epinephrine Push Dose

Mix 1 mL Epinephrine (1 mg/10 mL) with 9 mL Normal Saline and mix syringe
give 1-2 mL (10 - 20 mcg) every 3 minutes until MAP >65

12 Lead ECG

If arrest re-occurs, revert to appropriate protocol and/or initial successful treatment

General
EMR
EMT
AEMT
Paramedic
Med Control

Pulseless Electrical Activity (PEA)

History
- Past Medical History
- Medications
- Events
- End stage renal failure
- Estimated downtime
- Hypothermia?
- Overdose?
- DNR?

Signs and Symptoms:
- Pulseless
- Apneic
- No electrical activity on ECG
- No auscultated heart tones

Differential:
- Hypovolemia (trauma, AAA, other)
- Hypoxia
- Potassium(hypo/hyperkalemia)
- Overdose (TCA's, digoxin, beta blockers, calcium channel blockers)
- Acidosis
- Hypothermia
- Cardiac tamponade
- Massive MI
- Hyperkalemia

H's and T's
- Hydrogen Ion (acidosis)
- Hypovolemia
- Hypothermia
- Hypoglycemia
- Hyperkalemia
- Overdose (narcotics, tricyclics, calcium channel blocker, beta blocker
- Tension pneumothorax

Universal Patient Care

Cardiac Arrest Protocol

Adult Airway &
Adult IV/IO Protocols

AT ANY TIME ROSC (Return of Spontaneous Circulation)
remove ITD
Go to :
Post Resuscitation Protocol

Consider with all PEA patients

Fluid Bolus
Dextrose **50%** 25 g (50 ml) IVP, IO
or
Dextrose **10%** 5 - 10 g IVP, IO

Naloxone (Narcan)
2 - 4 mg IN, IVP, IO

EMR, EMT, can administer Narcan (IN & Auto-Injector only)

Epinephrine 1 mg/10 mL 1 mg IV, IO
Repeat every 3 - 5 minutes

Criteria to discontinue:
Cease efforts
Contact **OLMC** for guidance if needed

Calcium Chloride 1 g IVP, IO
(hyperkalemia arrest)

Sodium Bicarbonate
1 mEq/kg IVP, IO (TCA, hyperkalemia, renal failure)

Needle Chest Decompression

Glucagon 1 mg IV (beta blocker)

Go to:
Sodium Bicarbonate **(Special Considerations)**

Criteria to discontinue:
Cease efforts
Contact **OLMC** for guidance if needed

Pearls
- Always confirm asystole in more than one lead
- Always address correctable causes

General
EMR
EMT
AEMT
Paramedic
Med Control

Supraventricular Tachycardia

History
- Medications Theophylline, diet pills thyroid supplements, decongestants, digoxin
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past Medical History
- Palpitations
- Syncope

Signs and Symptoms:
- HR > 150/min
- QRS < 0.12 sec
- History of WPW go to V-Tach protocol
- Dizziness, Chest pain, Dyspnea
- Possible rhythms presenting
  - Sinus tach
  - Atrial fib/atrial flutter
  - Multifocal atrial tachycardia

Differential:
- WPW, Valvular heart disease
- Sick Sinus Syndrome
- MI
- Electrolyte imbalance
- Exertion, pain, emotional stress
- Fever
- Hypoxia
- Hypovolemia/anemia
- Overdose
- Hyperthyroidism
- PE

Universal Patient Care

Adult IV Protocol

12 Lead ECG

Attempt **Valsalva**

Adenosine (Adenocard)
6 mg rapid IVP
Push with 10 ml saline

Repeat
Adenosine (Adenocard)
12 mg rapid IVP
Push with 10 ml saline
if no effect with 6 mg

Diltiazem (Cardizem)
0.25 mg/kg slow IVP

Consider **Adenosine (Adenocard)**
6 mg rapid IVP Push with 10 ml saline
Sedate for **Cardioversion** with
Midazolam (Versed) 2 - 5 mg IVP
or **Ketamine (Ketalar)** 0.2 mg/kg IVP

Synchronized **Cardioversion**
100 J x 1, then 360 J Repeat as needed

Diltiazem (Cardizem)
0.25 mg/kg slow IVP
Maximum 20 mg

12 Lead ECG after conversion

Pearls
Exam: Mental status, skin, neck, lung, heart, abdomen, back, extremities, neuro
- History of WPW - do NOT give Cardizem
- Adenosine may not be effective in atrial flutter/fib, yet is not harmful
- Monitor for hypotension after Cardizem
- Monitor for respiratory depression and hypotension after Versed
- Continuous pulse oximetry
- Document rhythm changes with therapeutic interventions

General
EMR
EMT
AEMT
Paramedic
Med Control

Ventricular Tachycardia/Wide Complex w/Pulse

Adult Cardiovascular

History
- Past history, meds, diet, drugs
- Syncope/near syncope
- Palpitations
- Pacemaker
- Allergies: lidocaine

Signs and Symptoms:
- Ventricular tachycardia on ECG
- Conscious, rapid pulse
- Chest pain, SOB
- Dizziness
- Rate usually 150-180 bpm
- QRS > 0.12 sec

Differential:
- Artifact/device failure
- Cardiac
- Endocrine/metabolic
- Hyperkalemia
- Drugs
- Pulmonary

Universal Patient Care

Palpable pulse?

No → **V-Fib/Pulseless V-Tach**

Adult IV Protocol

Stable

12 Lead ECG

Amiodarone (Cordarone) 150 mg over 10 minutes IV

ONLY if QRS is regular and monomorphic Look for WPW If irregular and wide and polymorphic, use

Lidocaine (Xylocaine) 1 - 1.5 mg/kg IVP, IO

May repeat 0.5 - 0.75 mg/kg every 5 – 10 minutes

Maximum 3 mg/kg

If patient becomes unstable move to pre-arrest portion

For presumed hyperkalemia in cardiac arrest give **Calcium Chloride** 1 gram IVP, IO (renal failure/dialysis patients in cardiac arrest).

Pre-Arrest

No BP, altered mental status

Sedation for cardioversion

Midazolam (Versed)

2.5 to 5 mg IV, IM, IN

Ketamine (Ketalar) 0.2 mg/kg IVP, IN, IM

Synchronized **Cardioversion** 100 J

No response, repeat at 360 J

Repeat **Cardioversion** as needed

No response, **Amiodarone (Cordarone)**

150 mg IV Over 10 minutes then

1 mg/min IV infusion

General

EMR

EMT

AEMT

Paramedic

Med Control

Pearls

Exam: Mental status, skin, neck, heart, lungs, abdomen, back, extremities, neuro
- Torsades de Pointes may benefit from Magnesium Sulfate 2 gram IV
- For presumed hyperkalemia (renal failure, dialysis) administer 1 amp Sodium Bicarbonate

V-Fib/Pulseless V-Tach

History
- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal Failure/hemodialysis
- DNR

Signs and Symptoms:
- Unresponsive
- Ventricular fibrillation or ventricular tachycardia on ECG

Differential:
- Asystole
- Artifact/device failure
- Cardiac
- Endocrine/metabolic
- Drugs
- Pulmonary

Cardiac Arrest Protocol

Defibrillation sequence: **Defibrillate** @ 360 J or equivalent biphasic

Immediately resume **CPR** Reassess rhythm and repeat every 2 min

Adult Airway Protocol

Avoid over ventilation. Do not stop CPR for airway maneuvers

AT ANY TIME
ROSC
(Return of Spontaneous Circulation)

Go to: **Post Resuscitation**

Adult IV/IO Protocol

Epinephrine 1 mg/10 mL 1 mg IVP, IO

Repeat every 3 - 5 minutes

Amiodarone (Cordarone)

1st Dose 300 mg IVP, IO

2nd Dose 150 mg IVP, IO

OR

Lidocaine (Xylocaine)

1st Dose 1 - 1.5 mg/kg IVP, IO

2nd Dose 0.5 - 0.75 mg/kg IVP, IO

Consider

Magnesium Sulfate

2 g IVP, IO

Termination of Resuscitation (TOR) ALS and BLS

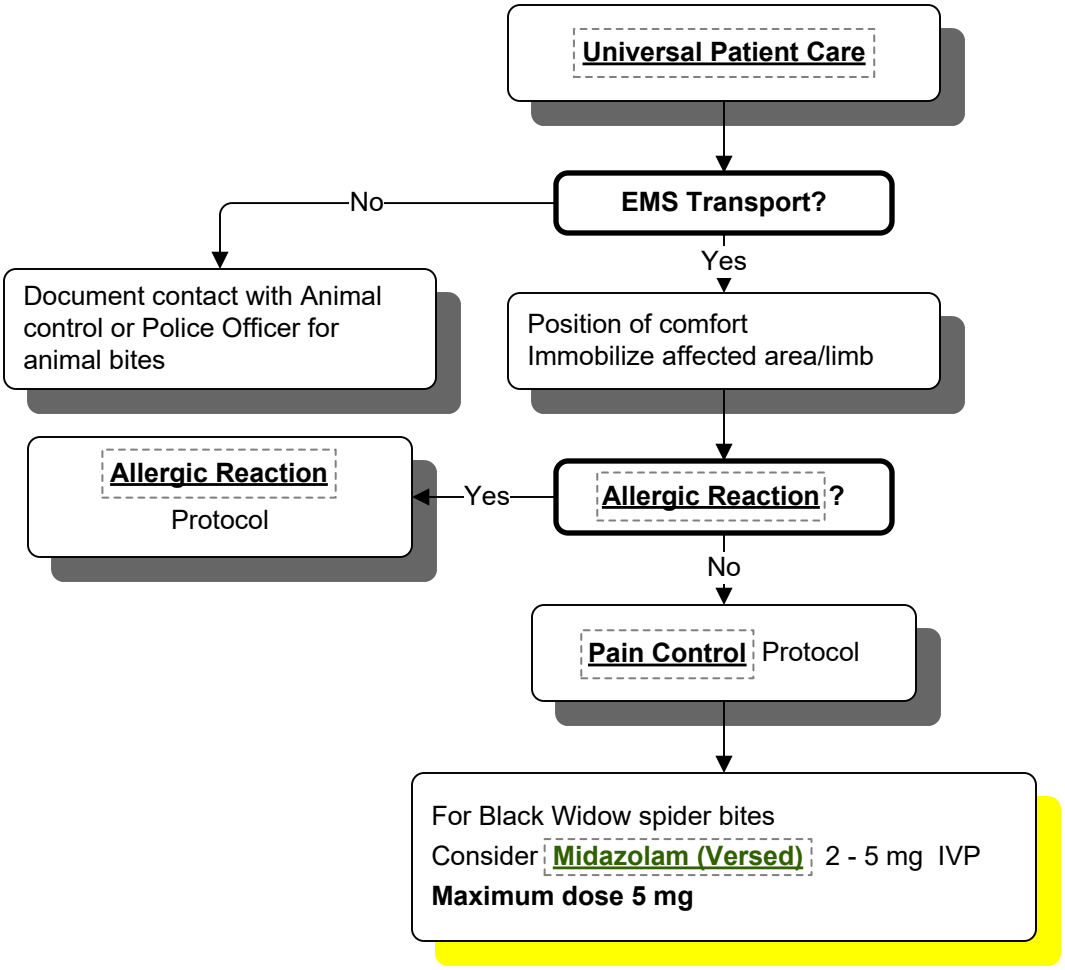
Pearls
- Do not stop CPR for airway maneuvers, consider placement of SGA (iGel or King LT)
- For suspected **HYPERKALEMIC ARREST** administer Calcium Chloride and Sodium Bicarbonate
- For **Torsades de Pointes** - 2 grams Magnesium Sulfate
- Effective CPR and early defibrillation are keys to success
- If unable to intubate, insert Supraglottic airway (King LTD) or i-Gel

Bites and Envenomation's

History
- Type of bite/sting
- Description of animal involved
- Time, location, size of bite/sting
- Previous reaction to bite/sting
- Domestic vs. wild
- Tetanus and rabies risk
- Immunocompromised patient

Signs and Symptoms:
- Rash, skin break, wound
- Pain, swelling, redness
- Blood oozing from the wound
- Infection?
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension/shock

Differential:
- Animal bite
- Human bite
- Snake bite
- Spider bite
- Insect sting/bite
- Infection risk
- Rabies/tetanus risk



Pearls
Exam: Mental status, skin, extremities, neck, lung, heart, abdomen, back, and neuro
- Human bites worse than animal bites
- Carnivore bites more likely to become infected and have risk of Rabies exposure
- Cat bites progress to infection rapidly
- Black widow spider bites are minimally painful, but over a few hours, muscle pain and severe abdominal pain develop
- Brown recluse spider bites are minimally painful. Tissue necrosis develops over a few days

Drowning/Submersion

History
- Submersion in water regardless of depth
- Possible history of trauma
- Duration of immersion
- Temperature of water
- Fresh or salt water

Signs and Symptoms:
- Unresponsive
- Mental status change
- Decreased or absent vital signs
- Vomiting
- Coughing

Differential:
- Trauma
- Pre-existing medical condition
- Pressure injury (diving)
  - Barotrauma
  - Decompression sickness

Universal Patient Care

Spinal Motion Restriction protocol

Adult Airway protocol
OR
Respiratory Distress protocol
OR
Other appropriate protocol

Adult IV Protocol

Cardiac monitor
Pulse Oximetry
$EtCO_2$

CPAP 5 cmH20 for respiratory distress In awake patients able to maintain own airway

General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls
Exam: Trauma survey, head, neck, chest, pelvis, back, extremities, skin, neuro
- With cold water there is no time limit - resuscitate all
- All victims should be transported for evaluation due to potential for worsening over next several hours
- All appropriately trained rescuers to remove victims from areas of danger
- With pressure injuries, consider transport to a hyperbaric chamber (The closest hyperbaric facility by air ambulance)

Hyperthermia

Some causes of hyperthermia are:
High temperatures in the environment or excessive exercise in moderate to extremely high temperatures. Also, Older or ill incapacitated patient, a failing of temperature regulating center.

Celsius	Fahrenheit
37.0	98.6
37.2	99
37.8	100
38.3	101
38.8	102
39.4	103
40.0	104
40.5	105
41.1	106
41.6	107
42.2	108

Universal Patient Care

Document patient temperature

Move to cooler environment, remove all outer clothing.

Apply room temperature water to skin and increase air flow around patient
Consider
Cold packs to major artery sites

Be prepared for seizures. Direct fan on patient if available.
DON'T GIVE FLUIDS ORALLY.

Adult IV

Maintain systolic B/P greater than 100 mmHg.

Give IV/IO Bolus 1 Liter NS or LR

Monitor and reassess

Appropriate Protocol
based on patient symptoms

For control of shivering during cooling

Midazolam (Versed) 2 mg IVP, 5 mg IM or, 5 mg IN

Signs & Symptoms
Heat Cramps
Severe muscle cramps
Heat Exhaustion
Altered mental status, dizziness, nausea & vomiting, headache, elevated core body temperature
Heat Stroke
Extremely elevate core body temperature, the absence of sweating, with hot red or flushed dry skin, rapid pulse, difficulty breathing,
strange behavior, hallucinations, confusion, agitation, disorientation
seizure, coma

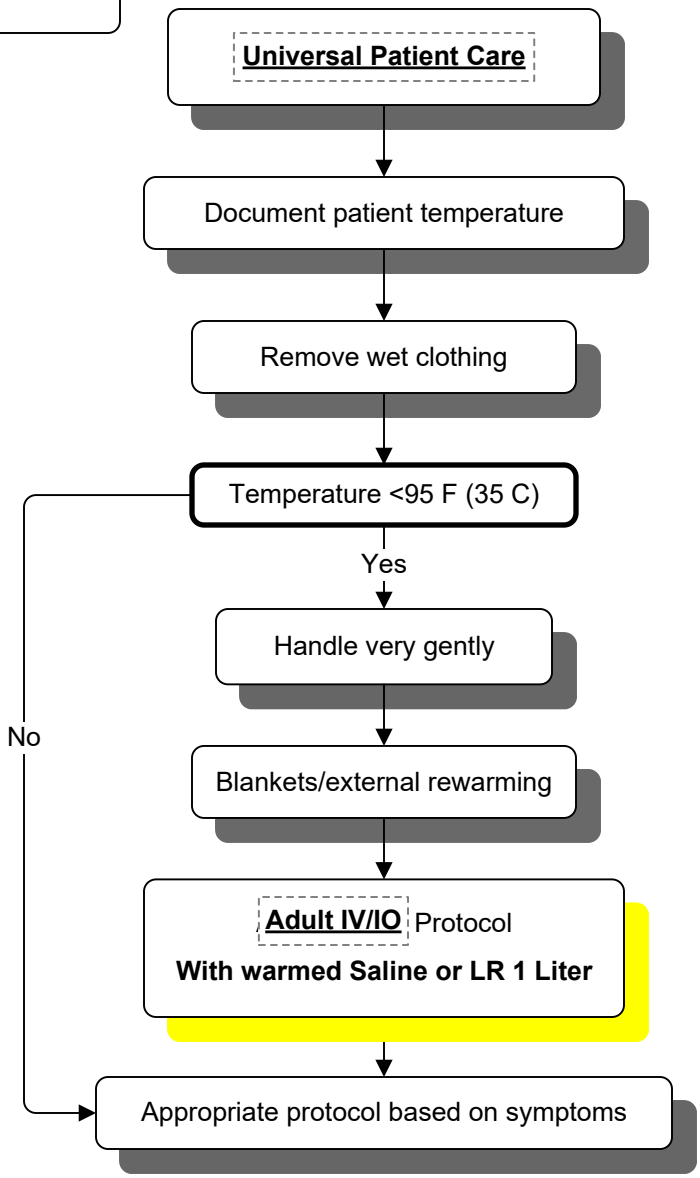
General
EMR
EMT
AEMT
Paramedic
Med Control

Hypothermia

History
- Age
- Exposure to environment even in normal temperatures
- Past medical history/meds
- Exposure to extreme cold
- Length of exposure/wetness
- Drug use
- Infection/sepsis
- Extremes of age

Signs and Symptoms:
- Cold, clammy
- Shivering
- Mental status change
- Extremity pain/sensory abnormality
- Bradycardia
- Hypotension
- Shock

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



Pearls
Exam: Mental status, skin, HEENT, heart, lungs, neuro
- No patient considered dead until warm
- Core temperature < 35 C (95 F)
- Extremes of age susceptible
- Temp. less than 31 C (88 F) V-Fib is common cause of death. Handle these patients gently to prevent V-Fib
- Hypothermia may produce severe bradycardia
- Shivering stops below 32 C (90 F)

Abdominal Pain

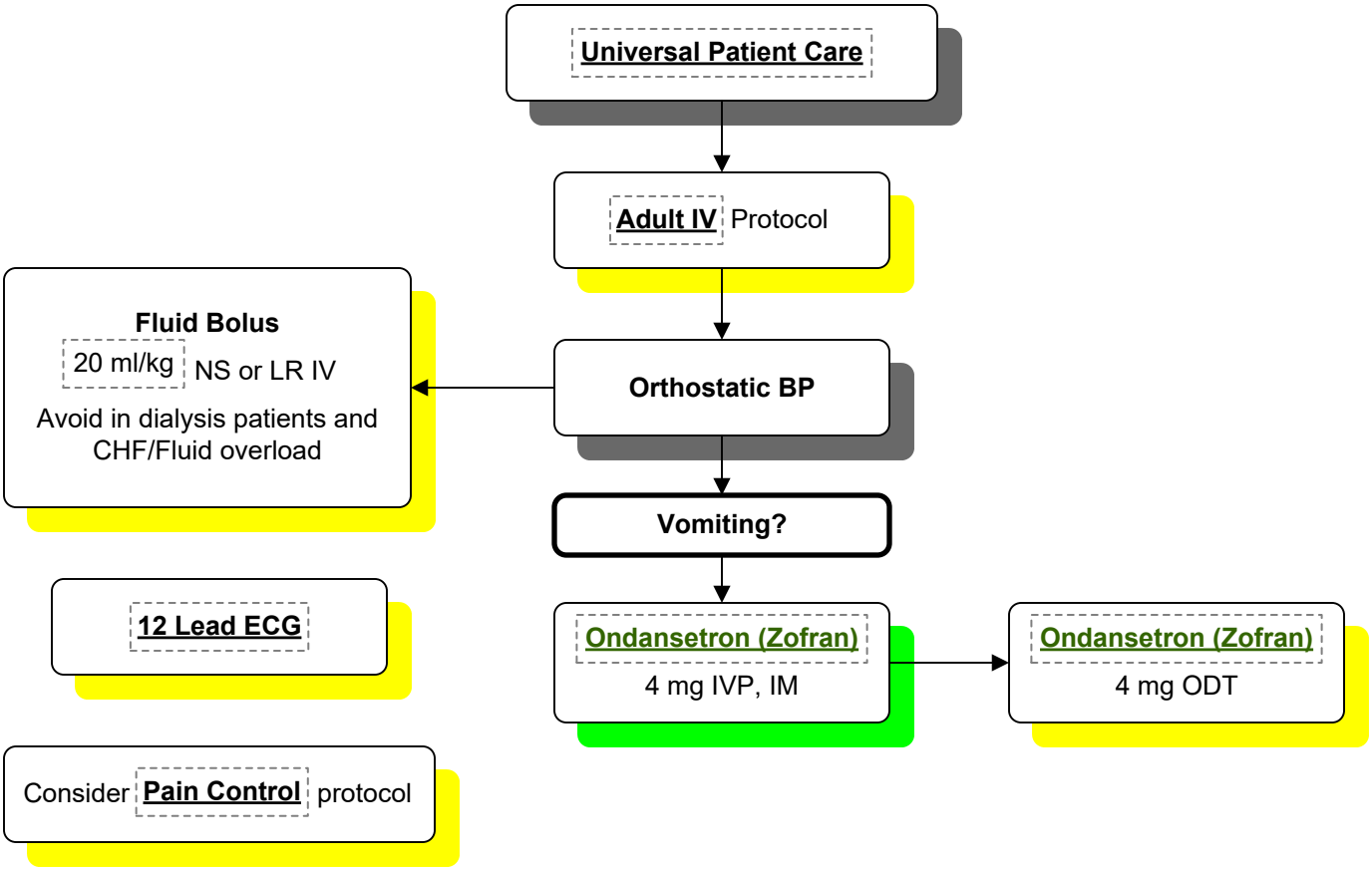
Adult Gastrointestinal

History
- Age
- Past medical history/surgical history
- Medications
- Onset
- Palliation/Provocation
- Quality
- Region/Radiation/Referred
- Severity
- Time
- Fever
- Last meal
- Last bowel movement/emesis
- Menstrual history (pregnant?)

Signs and Symptoms:
- Pain
- Tenderness
- Nausea/vomiting/diarrhea
- Dysuria
- Constipation
- Vaginal bleeding/discharge
- Pregnancy

Associated Symptoms:
- Fever
- Headache
- Weakness
- Malaise
- Myalgias
- Cough
- Mental status changes
- Rash

Differential:
- Pneumonia/PE
- Liver
- Peptic ulcer/gastritis
- Gallbladder
- MI
- Pancreatitis
- Kidney stone
- AAA
- Appendicitis
- Bladder/prostate
- Pelvic (ectopic, PID, ovarian cyst)
- Spleen
- Diverticulitis
- Bowel Obstruction
- Gastroenteritis



Pearls
Exam: Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Abdominal pain in women of childbearing age g Ectopic pregnancy until proven otherwise
- Consider AAA in pts. > 50 years old with abdominal pain
- Repeat vital signs after therapeutic interventions
-**Zofran (Ondansetron) ODT= Oral Dissolving Tablet, may be given on the tongue(4 mg ODT)
(Do Not Give Ondansetron to 1st trimester pregnant patients)

Vomiting/Diarrhea

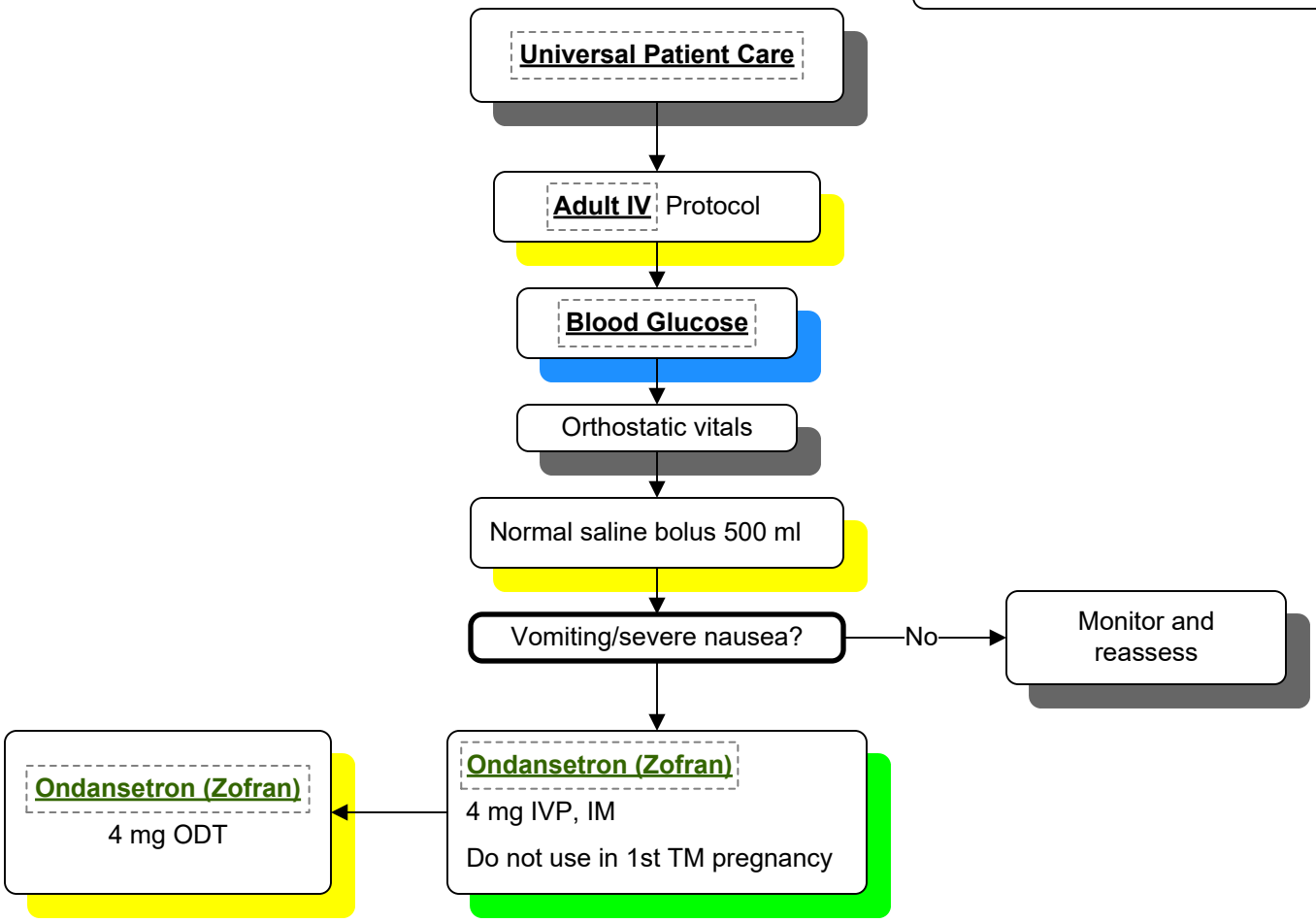
Adult Gastrointestinal

History
- Age
- Last meal
- Last BM/emesis
- Duration
- Sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history
- Travel history
- Bloody emesis/diarrhea

Signs and Symptoms:
- Pain Constant, sharp, dull, etc.
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

Associated Symptoms:
- Fever, Headache, blurred vision, weakness, myalgias, cough, dysuria, mental status changes, rash

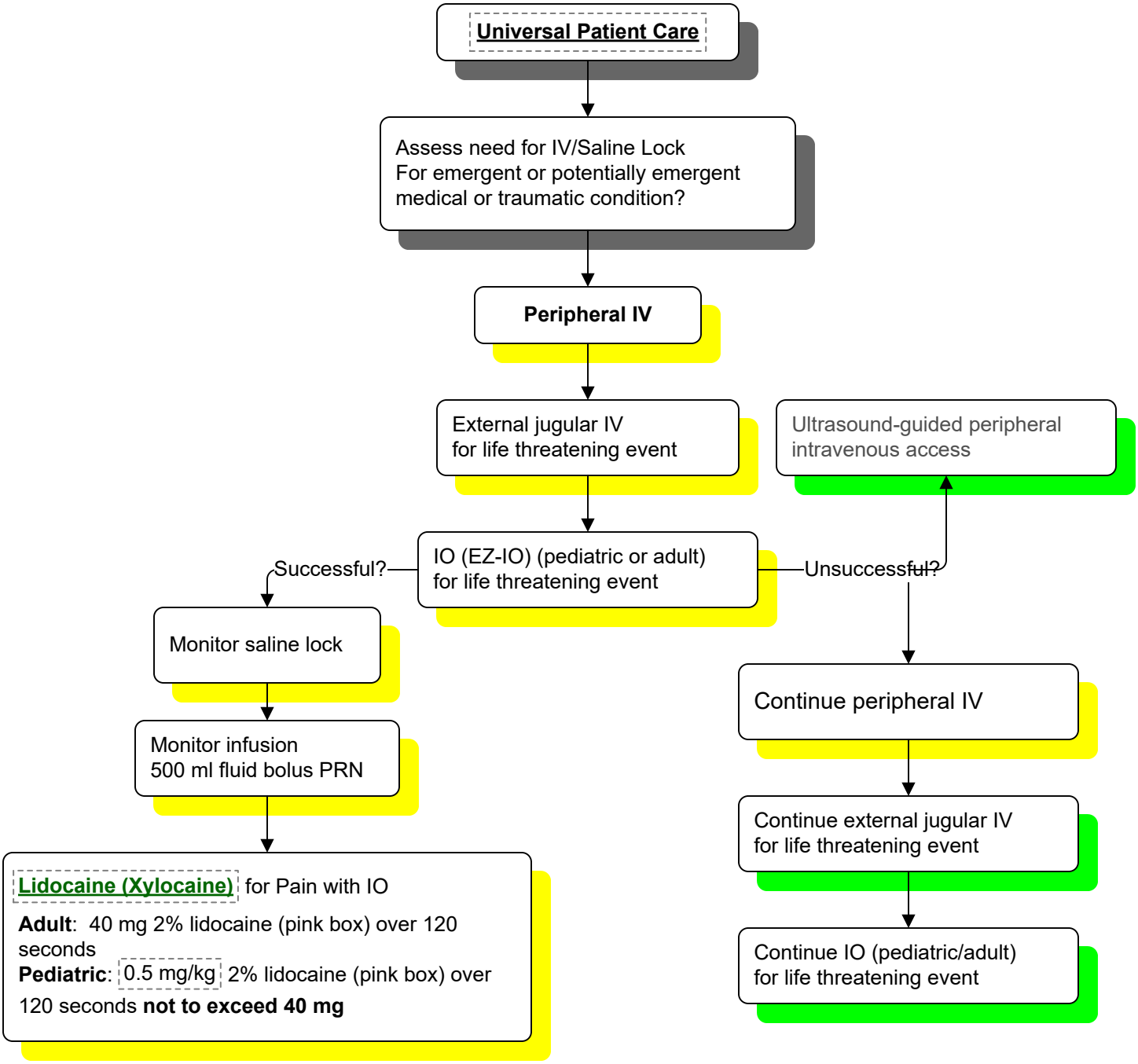
Differential:
- CNS
- MI
- Drugs
- GI/renal
- DKA
- Gynecologic
- Infections
- Electrolyte imbalance
- Food or toxin induced
- Medication/substance abuse
- Pregnancy
- Psychologic



Pearls
Exam: Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neuro - Maintain high suspicion of cardiac event for persons with diabetes or neuropathies

General
EMR
EMT
AEMT
Paramedic
Med Control

Adult IV/IO



Pearls

- IO with EZIO for adult or pediatric patient for cardiac arrest or unresponsive patient with no available IV site
- Saline locks are preferred unless fluid bolus anticipated
- External jugular (>12 years old)
- Any pre-hospital fluids or medications approved for IV use may be given through IO
- All rates KVO unless giving fluid bolus
- Use microdrips for patients under 6 years old (if available)
- External jugular lines can be attempted initially in life-threatening events with no obvious peripheral site
- In CARDIAC ARREST, pre-existing dialysis shunt or external central venous catheter may be used
- In patients who are hemodynamically unstable or in extremis, contact OLMC prior to accessing dialysis catheter or central catheters
- Any venous catheter which has already been accessed prior to EMS arrival may be used
- Upper extremity preferred to lower extremity IV sites
- In post mastectomy patients, avoid IV/injection or blood pressure in arm on affected side

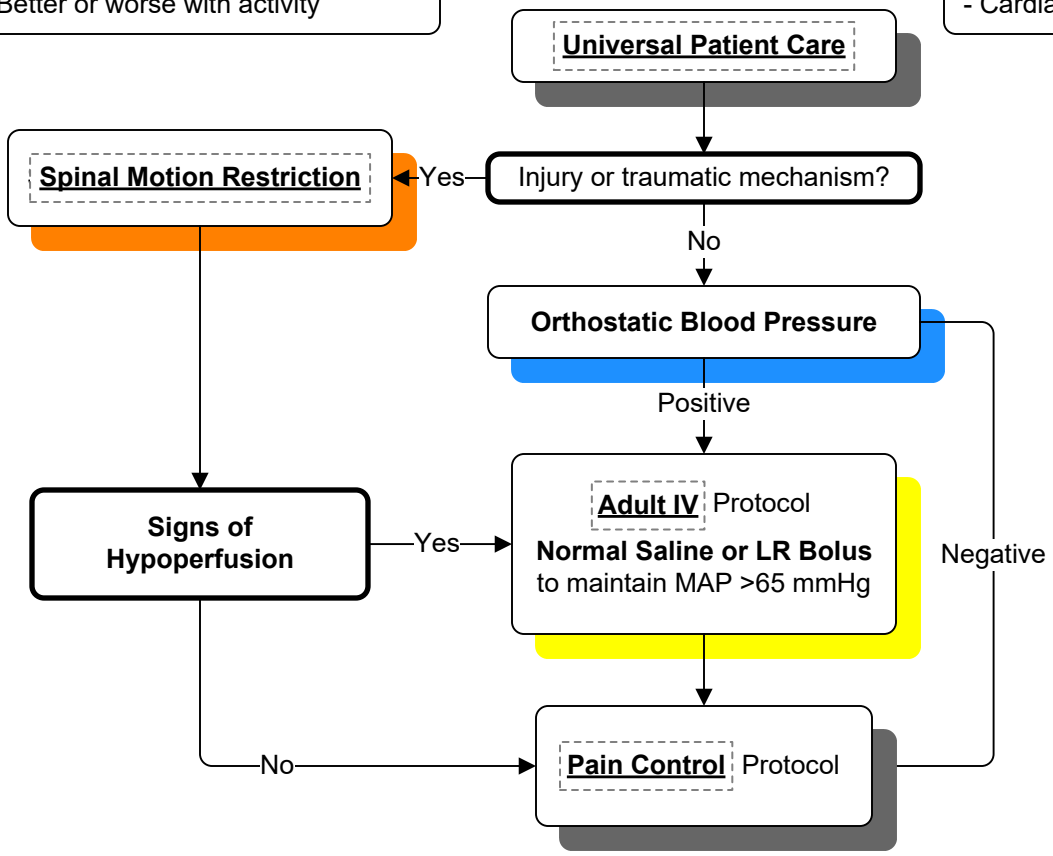
Back Pain

Adult General Medical

History
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain/injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Better or worse with activity

Signs and Symptoms:
- Pain
- Swelling
- Pain with ROM
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel or bladder dysfunction

Differential:
- Muscle spasm/strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis
- Aortic aneurysm
- Pneumonia
- Cardiac



Pearls
Exam: Mental status, HEENT, neck, chest, lungs, abdomen, back, extremities, neuro
- Abdominal aneurysm: consider in patients > 50 years old
- Kidney stones typically present with acute onset flank pain radiating to groin area
- Patients with midline pain over the spinous process should be spinally immobilized
- Any bowel or bladder incontinence is a significant finding which requires immediate medical evaluation

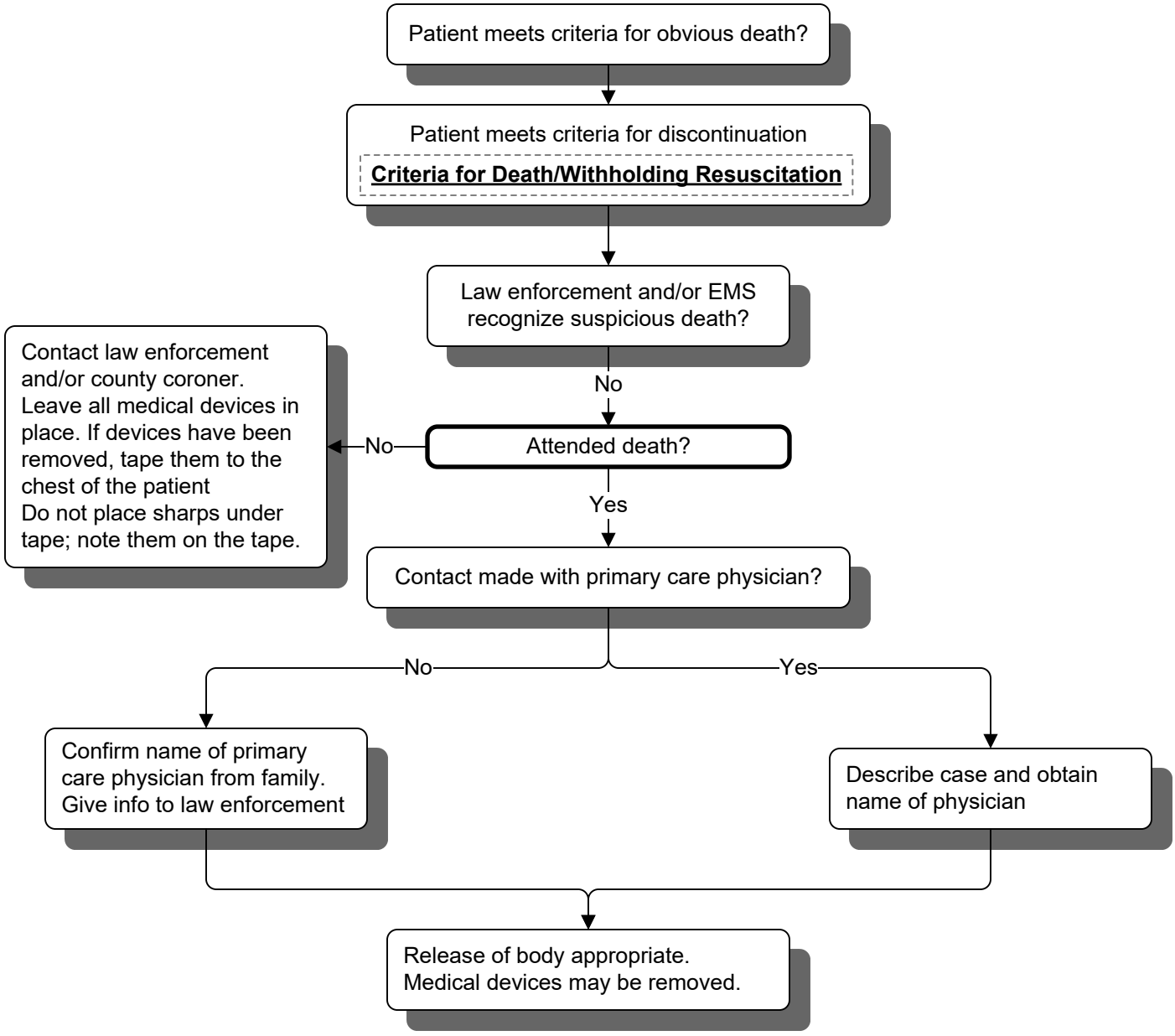
Deceased Persons

Adult General Medical

History
- Patient encountered by EMS who meets criteria for obvious death
- Patient with duly executed DNR who is apneic
- Patient for whom resuscitation efforts are ceased on-scene

Key Information:
- Name of primary care physician
- Known medical conditions
- Last time known to be alive

Differential:
- Attended death - a patient with a primary care physician who apparently died of medical causes (natural death)
- Unattended death - a patient without a primary care physician who apparently died of medical causes (natural death)
- Suspicious death (law enforcement)



Pearls
- The body of a deceased person may be released to the funeral home if the death is attended and law enforcement confirms that the death is not suspicious. It is preferred to communicate directly with the primary care physician prior to releasing the body. All reasonable attempts to contact the PCP must be made.
- If the death is unattended, the Medical Examiner must be contacted.
- If the death is traumatic, the Medical Examiner must be contacted.

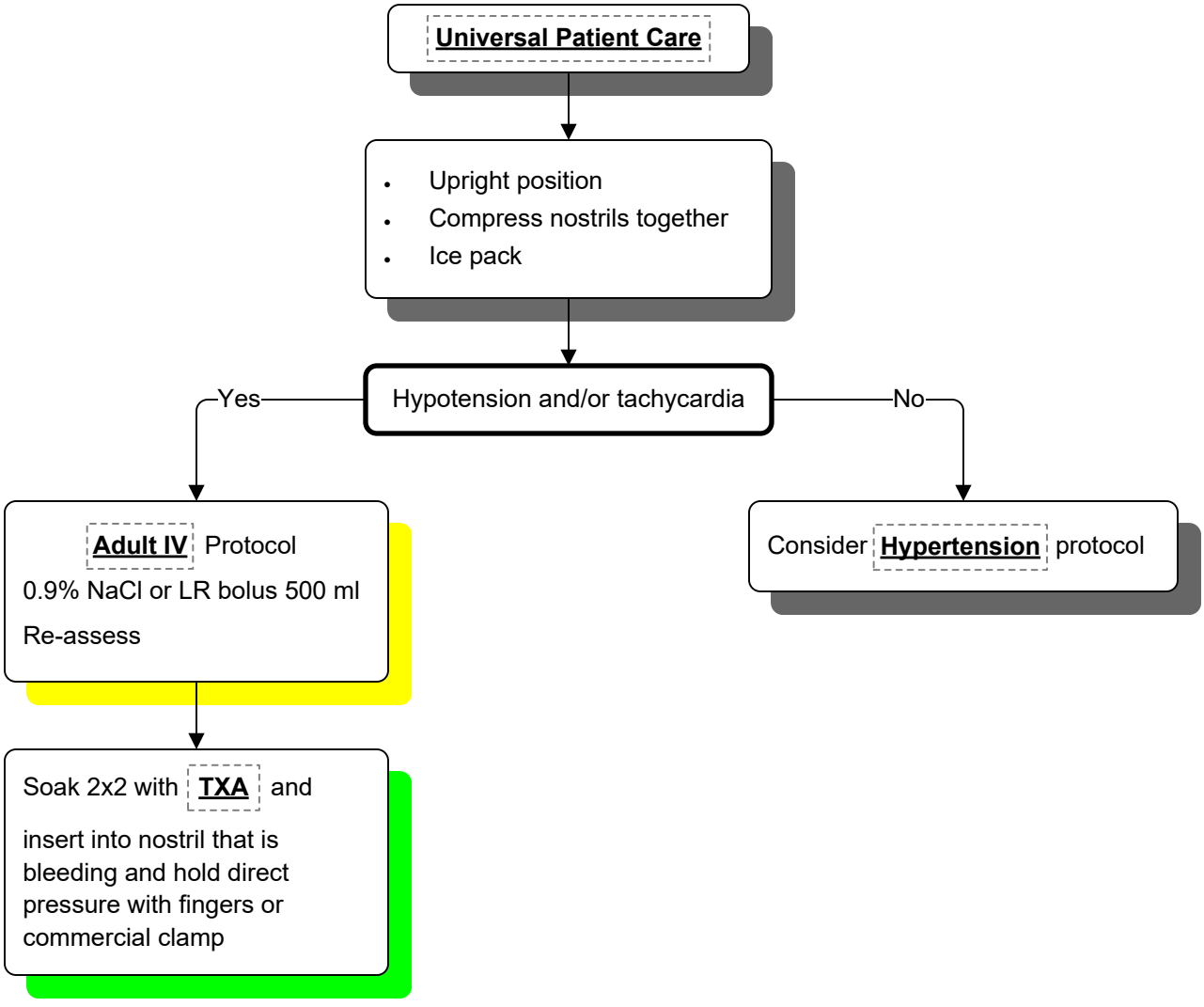
Epistaxis

Adult General Medical

History
- Age
- Past medical history
- Medication (BP, anticoagulants)
- Trauma
- Previous nosebleeds
- Duration
- Quantity

Signs and Symptoms:
- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

Differential:
- Trauma
- Infection
- Allergic rhinitis
- Lesions (polyps/ulcers)
- Hypertension



Pearls
Exam: Mental status, HEENT, neck, heart, lungs, neuro
- It is difficult to quantify the amount of blood loss in epistaxis
- Bleeding may be posterior and you may see the patient expel blood clots from the mouth
- Anticoagulants include: aspirin, Coumadin, Plavix, NSAIDS, Pradaxa, Eliquis, Xarelto, Lovenox

Fever/Suspected Sepsis

Adult General Medical

History
- Age
- Duration
- Severity
- Past medical history
- Medications
- Immunocompromized (HIV, transplant, diabetes, cancer)
- Exposure
- Last acetaminophen/ibuprofen use

Signs and Symptoms:
- Warm
- Flushed
- Sweaty
- Chills/rigors
- Myalgias, cough, chest pain
- Headache
- Dysuria
- Abdominal pain
- Mental status change
- Rash

Differential:
- Infection/sepsis
- Cancer/tumors/lymphomas
- Medication reaction
- Connective tissue disease
- Hyperthyroid
- Heat stroke
- Meningitis

Vasopressors

Norepinephrine (Levophed)

0.1 – 0.5 mcg/kg/min IV

Epinephrine 0.1 - 0.5 mcg/kg/min IV

Dopamine (Intropin) 5 - 10 mcg/kg/min

MAP >65 (**for interfacility transports ONLY--not for routine prehospital use**)

Epinephrine Push Dose

Mix 1 mL Epinephrine (1 mg/10 mL) with 9 mL NS and mix syringe give 1-2 mL (10 - 20 mcg) every 3 minutes until MAP >65

Universal Patient Care

Consider droplet, airborne, contact precautions

Suspected Sepsis?
Pulse, RR, BP, $EtCO_2$, Temperature

Yes → **Support Airway**

Establish 2 large bore IVs
0.9% NaCl or LR bolus
30 ml/kg
Reassess Vitals/lung sounds
Notify receiving facility of Sepsis Alert

No

Monitor/trend Vital Signs
Limit on-scene time to 15 min
Prevent Hypothermia

Pearls

Exam: Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neuro

- SIRS = Systemic Inflammatory Response Syndrome = Fever > 38 (100.4) or < 36 (96.8); HR > 90; RR > 20, Decreased $EtCO_2$
- Sepsis: one or more organs begins to fail. Septic shock = sustained hypotension after aggressive fluid resuscitation
- Avoid hypoxia. Consider CPAP early; Intubate for altered mental status/respiratory failure
- Avoid overventilation to prevent acute lung injury
- **Avoid pressors (Norepinephrine) until adequate fluid resuscitation has been performed**
- Febrile seizure are more likely in children with history of febrile seizures with rapid elevation in temperature
- Droplet precautions include standard PPE plus surgical mask for provider and NRB or surgical mask for pt. Use for suspected influenza, meningitis, mumps, strep when spread by large droplets suspected
- Airborne precutions include standard PPE plus a N-95 mask for providers and surgical mask/NRB for pt. Use for TB, measles, varicella
- Contact precautions include standard PPE plus gown, change gloves after every patient contact, strict handwashing precautions. Use with MRSA, scabies, shingles, or other illnesses spread by contact
- All hazards precautions include standard PPE + airborne + contact > Use during initial phase of outbreak with unknown agent

Pain Control

Adult General Medical

History
- Age
- Location
- Duration
- Severity
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms:
- Severity
- Quality
- Radiation
- Relation to movement
- Increased with palpation

Differential:
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural/respiratory
- Neurogenic
- Renal

Universal Patient Care

Care based on complaint specific protocol

Pain severity > 6/10
OR
Indication for IVP, IM, IN pain medication?

Adult IV Protocol
Pulse Oximetry / Capnography

Morphine 2 - 5 mg IVP, IM
or
Fentanyl (Sublimaze) 50 - 100 mcg IVP, IM, IN
or
Nalbuphine (Nubain) 5 mg IVP, 10 mg IM
or
Ketamine (Ketalar) 0.2 mg/kg SLOW IVP, IN, IM
Maximum dose 25 mg
Mix in 50 mL NS and give over 10 minutes

Pearls
- Pain severity is a vital sign and must be recorded pre and post IV/IM pain medications
- Vitals should be obtained pre, post, and at disposition with all pain medications
- Contraindications to Morphine = hypotension, altered mental status, head injury, respiratory distress, severe COPD
- Document drug allergies
- Observe for drug reaction

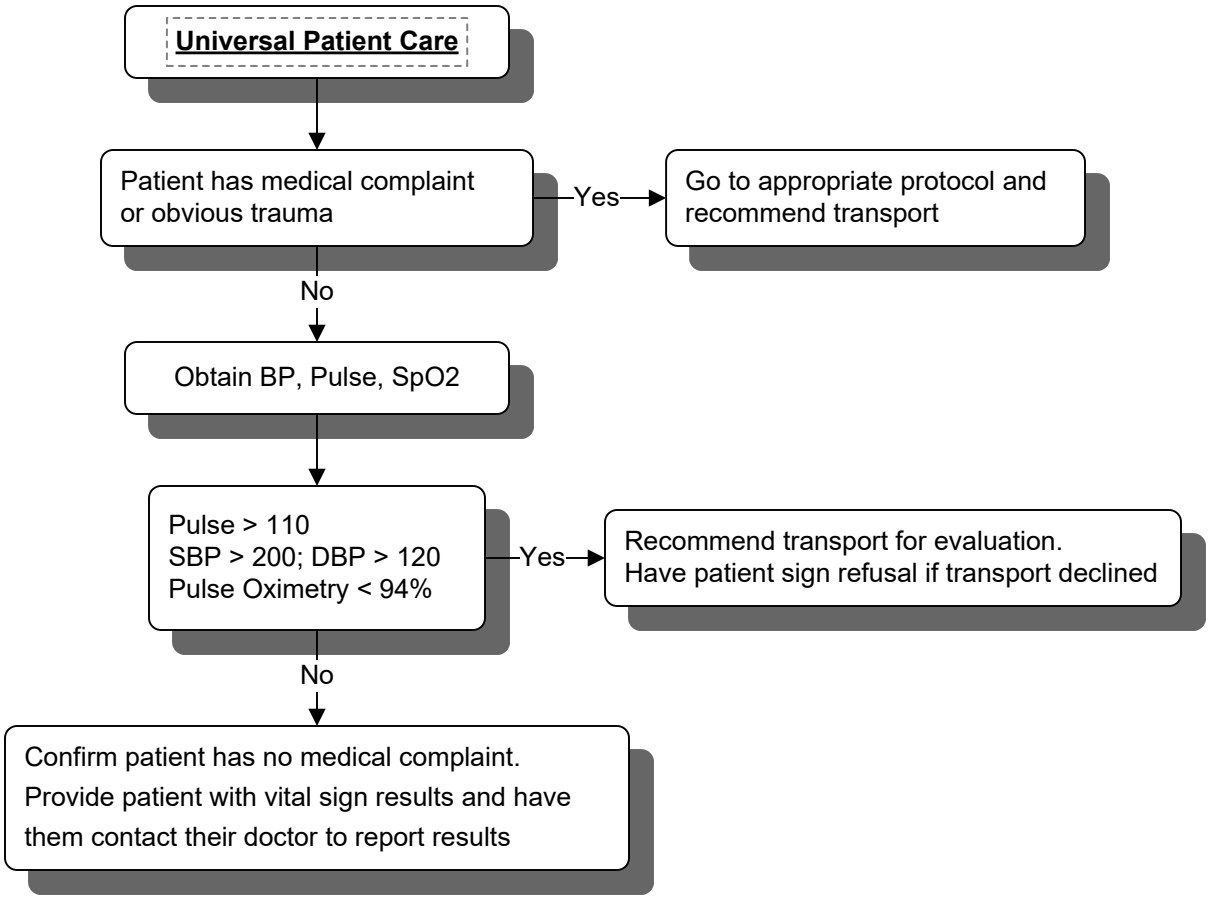
Well Person Check

Adult General Medical

History
- Patient presents requesting blood pressure check
- EMS response to "assist invalid"
- Other situation in which patient does not have a medical complaint or obvious injury

Signs and Symptoms:
- Assess for medical complaint
- For patients with hypertension, check for chest pain, dyspnea, neuro changes
- For invalid assist calls, check for syncope, chest pain, trauma, inability to ambulate

Differential:
- Hypertensive urgency
- Hypertensive emergency
- Syncope
- Cardiac ischemia/dysrhythmia
- Fracture
- Head trauma



Pearls
- Patients who are denying more severe symptoms may initially present for a routine check
- All persons who request service shall have a PCR completed
- For this category of patient, the PCR may be brief, but must include vital signs and documentation of a lack of medical complaint. Complete trauma exams on patients with potential mechanism for trauma

Altered Mental Status

Adult Neurological

History
- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or ingestion
- Past medical history
- Medications
- History of trauma

Signs and Symptoms:
- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin, fruity breath)
- Kussmaul respiration, dehydration

Differential:
- Head trauma
- CNS (CVA, tumor, seizure, infection)
- Infection
- Thyroid
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper/hypoglycemia)
- Toxicologic
- Acidosis/Alkalosis
- Environmental exposure
- Pulmonary
- Electrolyte abnormality
- Psychiatric

Universal Patient Care

Consider Spinal Motion Restriction

Adult IV Protocol

Blood Glucose

No

Oral Glucose 15 grams
if airway not compromised

Dextrose 50% 25 g (50 ml) IVP, IO or
Dextrose 10% 5 - 10 g IVP, IO
Glucagon 1 mg IM, IN (EMT Permitted to administer).(if no IV access)

Thiamine 100 mg IVP

Return to baseline?

If yes, patient may refuse transport without OLMC order. IF patient is not on oral diabetic meds and adult present with patient blood glucose >100 Patient. able to eat meal now

Naloxone (Narcan) 2 mg IN

Naloxone (Narcan) 2 mg IN

Consider other cause:
Head injury OD
CVA Hypoxia

Consider **Dextrose 10%** 5 – 10 grams IVP, IO
And reassess
Naloxone (Narcan) 2 mg slow IV, IN, IM
12 Lead ECG

Normal Saline Bolus
1,000 ml

D10% mixing (no premix available)
Remove 50 ml of NS from 250 ml bag
Add 1 amp D50% to bag = D10%
Give 50 - 100 ml (5 - 10 grams) IV until return to baseline mentation
Recheck blood sugar

General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls Exam: Mental status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Use caution for environmental toxin or Haz-Mat exposure as cause of mental status changes
- Safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood sugar after D50/glucagon
- Do not let alcohol confuse clinical picture
- Do not give oral glucose if patient cannot protect airway
- Consider patient restraints
- Omit thiamine if no signs of malnutrition or alcoholism

Behavioral Emergency

History
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse/OD
- Diabetes

Signs and Symptoms:
- Anxiety
- Agitation
- Confusion
- Affect change
- Hallucinations
- Delusional thoughts
- Bizarre behavior
- Combative/violent
- Expression of suicidal/homicidal thoughts

Differential:
- See altered mental status
- Hypoxia
- Alcohol intoxication
- Medication effect/OD
- Withdrawal syndromes
- Depression
- Bipolar
- Schizophrenia

Scene Safety

Universal Patient Care

Treat suspected medical or trauma problems per protocol

Remove patient from stressful environment

Verbal techniques (reassurance, calm, rapport)

No

Patient MUST exhibit a Violent THREAT NOT to be used for anxiety, hyperventilation, Dyspneic patients. May not be used at request of law enforcement.
All patients must be treated in supine position. Absolutely no prone treatment.

Ketamine (Ketalar) 4 mg/kg IM, IN
Immediately place IV, O2, Monitor, $EtCO_2$ Monitor vitals including
$EtCO_2$ Apply **Oxygen** Give 1 L NS
Apply **Soft restraints**

In the absence of a Paramedic, the AEMT may administer
Midazolam (Versed) 2 - 5 mg IV, IM, IN
for violent patient requiring physical and chemical restraint
All patients receiving sedation must have continuous monitoring of vital signs

Ketamine shortage procedure"

Ketamine is first choice for treating violent behavioral emergencies.
If unavailable, give **Midazolam (Versed)** 2 - 5 mg IVP, IM, IN
and may repeat x 1

Pearls
Exam: Mental status, skin, heart, lungs, neuro
- All patients given sedation must have IV, $EtCO_2$, SpO2, cardiac monitoring, supplemental oxygen;
- Consider ALL causes for behaviorgTrauma vs. medical (hypoglycemia, OD, hypoxia, head injury, substance abuse
- Do not overlook possibility of domestic violence or child abuse
- Patients with violent behavioral emergencies are often dehydration and acidotic (low $EtCO_2$)
- All patients with physical or chemical restraints must be continuously observed by ALS personnel on scene in supine position ONLY

Seizure

History
- Reported/witnessed seizure
- Previous seizure history
- Medical alert tag
- History of trauma
- History of diabetes
- History of pregnancy

Signs and Symptoms:
- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconsciousness

Differential:
- CNS trauma
- Tumor
- Metabolic, hepatic, renal failure
- Hypoxia
- Electrolyte abnormality
- Drugs, meds, non-compliance
- Infection/fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

Universal Patient Care

Consider **Spinal Motion Restriction** criteria

Status Epilepticus / Postictal

Adult Airway Protocol
Blood Glucose

Adult IV Protocol

Midazolam (Versed) 2 – 5 mg Slow IVP
OR 5 mg IM, IN May be repeated x 1

Focused history/exam

Blood Glucose

Adult IV Protocol

Thiamine 100 mg IVP

Glucose < 60 mg/dl

Dextrose **50%** 25 g (50 ml) IVP, IO
or
Dextrose **10%**
5 – 10 g IVP, IO
and reassess
Glucagon 1 mg IM (EMT permitted)

Status/seizure recurs?
Midazolam (Versed)
2 - 5 mg slow IV
OR **Midazolam (Versed)**
5 mg IM, IN
may be repeated x1

General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls
Exam: Mental status, HEENT, heart, lungs, extremities, neuro
Status Epilepticus - > 2 successive seizures without a period of consciousness or recovery
Grand mal - generalized - LOC, incontinence, tongue trauma
Focal seizures (petit mal) - only a part of the body affected and not associated with LOC
Jacksonian seizures - focal seizures that become generalized
- Be prepared for airway problems and continued seizures
- Assess for occult trauma and substance abuse
- Be prepared to assist ventilation if midazolam is used
- Seizures in pregnant patient: follow OB Emergency Protocol
- Thiamine may be omitted in patients who do not appear malnourished

Suspected Stroke

History
- Previous CVA, TIA
- Previous cardiac, vascular surgery
- Diabetes, HTN, CAD
- Afib
- Medications (blood thinners)
- Trauma?

Signs and Symptoms:
- Altered mental status
- Weakness/paralysis
- Blindness or sensory loss
- Aphasia/dysarthria
- Syncope
- Vertigo/dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hyper/Hypotension

Differential:
- See altered mental status
- TIA
- Seizure
- Hypoglycemia
- CVA
- Tumor
- Trauma

Universal Patient Care

Pre-Hospital Stroke Screens, Go to:
MEND / **RACE** / **Cincinnati Stroke Scale** / **BEFAST**

If positive and symptoms < 3 hours transport to approved stroke facility. Limit scene time .

< 60 mg/dl

Thiamine 100 mg IVP

Dextrose **50%**
25 g (50 ml0 IVP, IO or
Dextrose **10%**
5 – 10 g IVP, IO
If no IV access
Glucagon 1 mg IM
(EMT permitted to administer)

Yes

Blood Glucose

Adult IV Protocol

12 Lead ECG

Call a "**Stroke Alert**" when notifying stroke center

Notify Stroke Center of ***Last Known Well*** **time**

Consider other protocols as indicated:
- **Altered Mental Status**
- **Hypertension**
- **Seizure**
- **Adult Airway** **protocol**

Pearls
Exam: Mental status, HEENT, heart, lungs, abdomen, extremities, neuro
- Minimize scene/transport time.
- Onset of symptoms - last witnessed time the patient was symptom free
- Monitor for airway problems (swallowing, vomiting)
- Always assess for hypoglycemia
- Patients not malnourished do not require Thiamine
- Document RACE score
- Document 12-Lead ECG

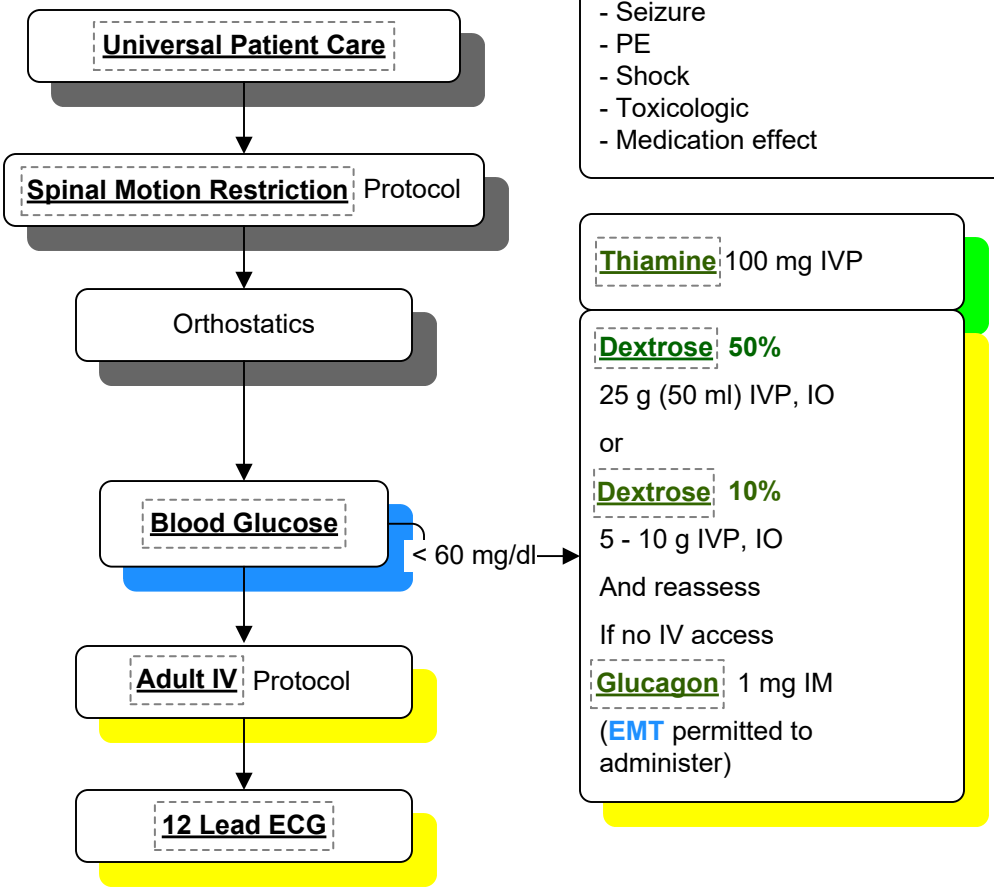
Syncope

Adult Neurological

History
- Cardiac, CVA, seizures
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss, N/V/D
- Past medical history
- Medications

Signs and Symptoms:
- LOC with recovery
- Light-headedness, dizzy
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Low blood pressure

Differential:
- Vasovagal
- Orthostatic hypotension
- Cardiac
- Micturation/defecation syncope
- Psychiatric
- CVA
- Hypoglycemia
- Seizure
- PE
- Shock
- Toxicologic
- Medication effect



Consider other protocols as indicated:
- Altered Mental Status
- Hypotension
- Seizure
- Adult Airway Protocol

Pearls
Exam: Mental status, skin, HEENT, heart, lungs, abdomen, extremities, neuro
- Assess for trauma
- Consider dysrhythmias, GI bleed, ectopic pregnancy, seizure as causes of syncope
- Omit thiamine in patients who are not malnourished
- More than 25% of geriatric syncope is cardiac dysrhythmia related

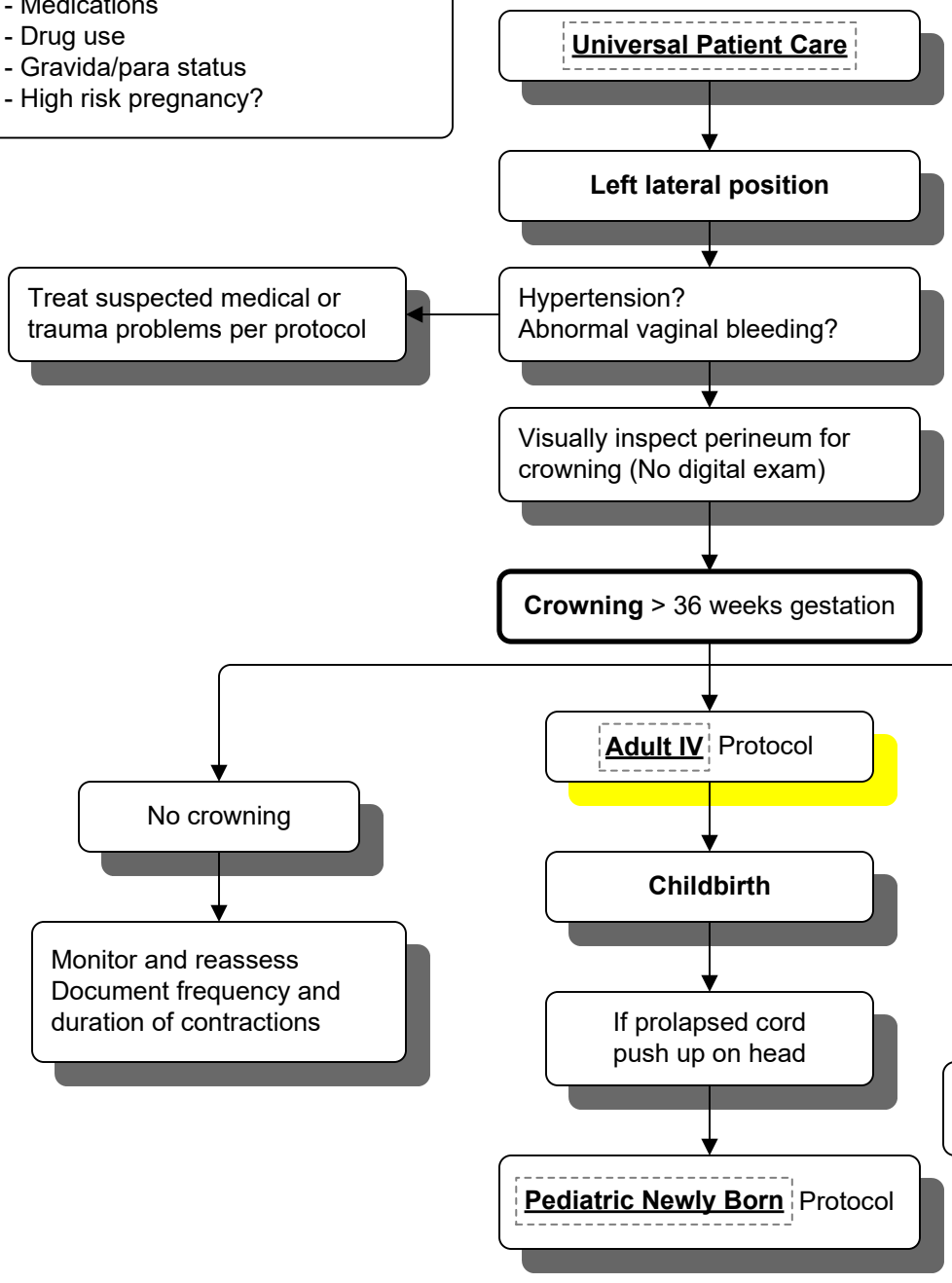
General
EMR
EMT
AEMT
Paramedic
Med Control

Childbirth/Labor

History
- Due date
- Time contractions started/how often
- Rupture of membranes
- Time/amount of vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Drug use
- Gravida/para status
- High risk pregnancy?

Signs and Symptoms:
- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

Differential:
- Abnormal presentation
- Buttock
- Foot
- Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta



General
EMR
EMT
AEMT
Paramedic
Med Control

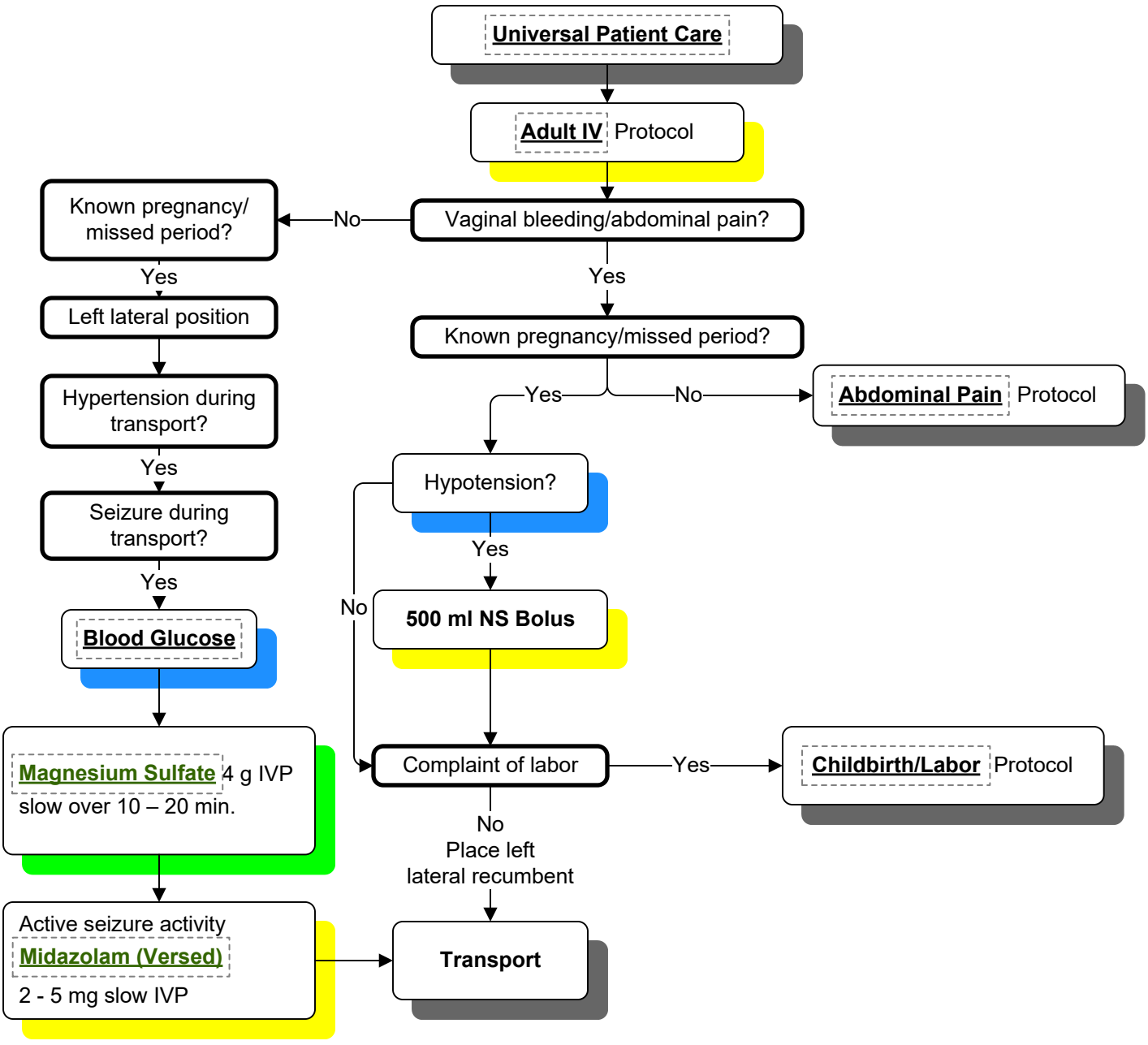
Pearls
Exam (mother): Mental status, heart, lungs, abdomen, neuro
- Document at all times (deliver, contractions frequency/length)
  Transport: Mother may lay in position of comfort if not fetal distress present; Preferred position is left lateral decubitus
  After delivery - massage uterus (lower abdomen) which will promote uterine contraction to control postpartum bleeding
- Some perineal bleeding is normal with childbirth, large quantities or free bleeding is abnormal
- Record APGAR at 1 and 5 minutes after birth

Obstetrical Emergency

History
- Past medical history
- Hypertensive meds
- Prenatal care
- Prior pregnancies
- G/P

Signs and Symptoms:
- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Headache
- Visual changes
- Facial/hand edema

Differential:
- Pre-eclampsia/eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion



General

EMR

EMT

AEMT

Paramedic

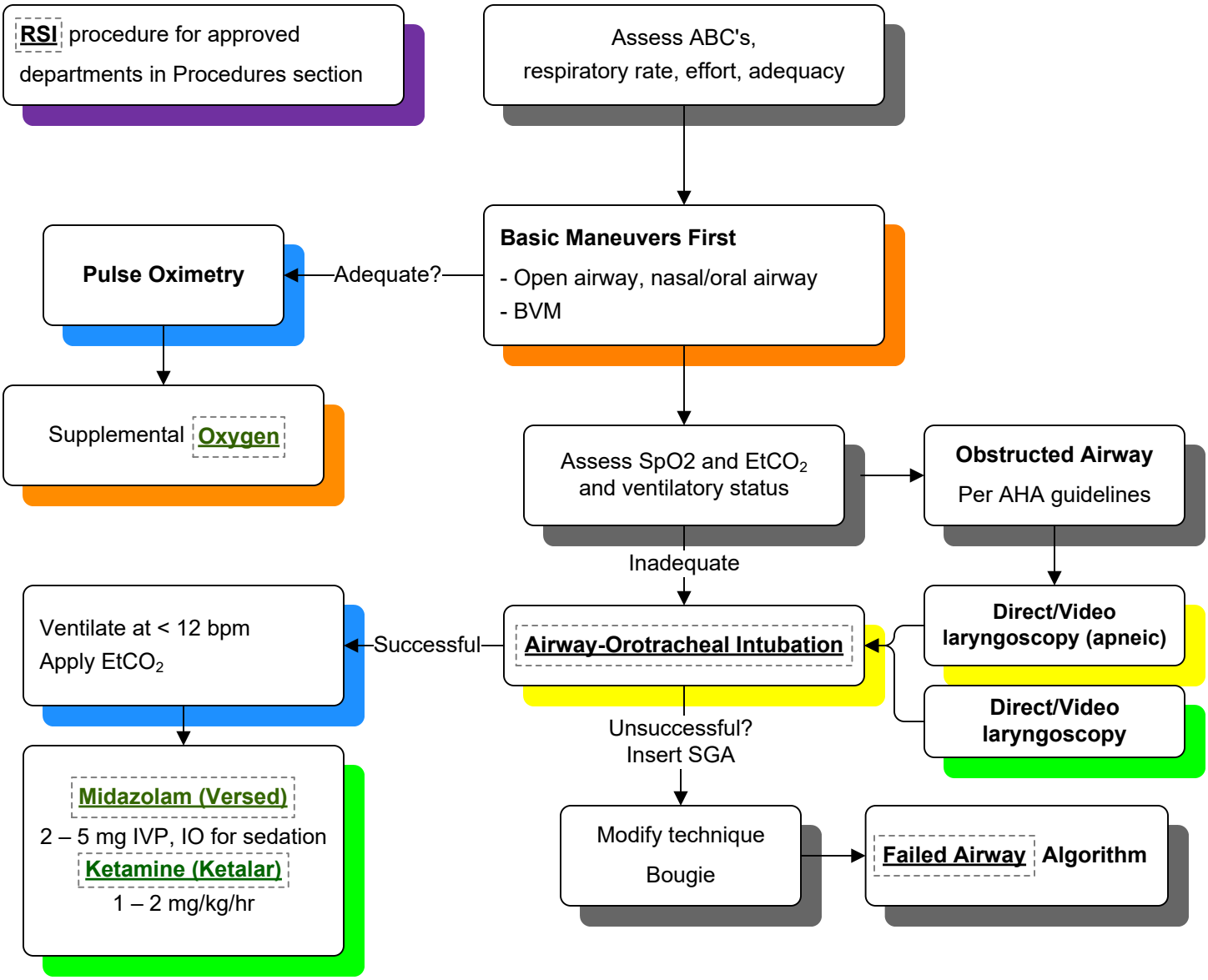
Med Control

Pearls
Exam: Mental status, abdomen, heart, lungs, neuro
- Severe headache, vision changes, RUQ pain may indicate pre-eclampsia
- In pregnancy, HTN = BP > 140/90
- Maintain patient in left lateral position to minimize risk of supine hypotensive syndrome
- Quantify bleeding = number of pads per hour
- Any pregnant patient in MVC should be seen by physician for evaluation and fetal monitoring
- Magnesium, in high doses (i.e. 6 grams), may cause hypotension and decreased respiratory drive. Use cautiously.

Adult Respiratory
Adult Respiratory

Adult Airway

Adult Respiratory



Pearls

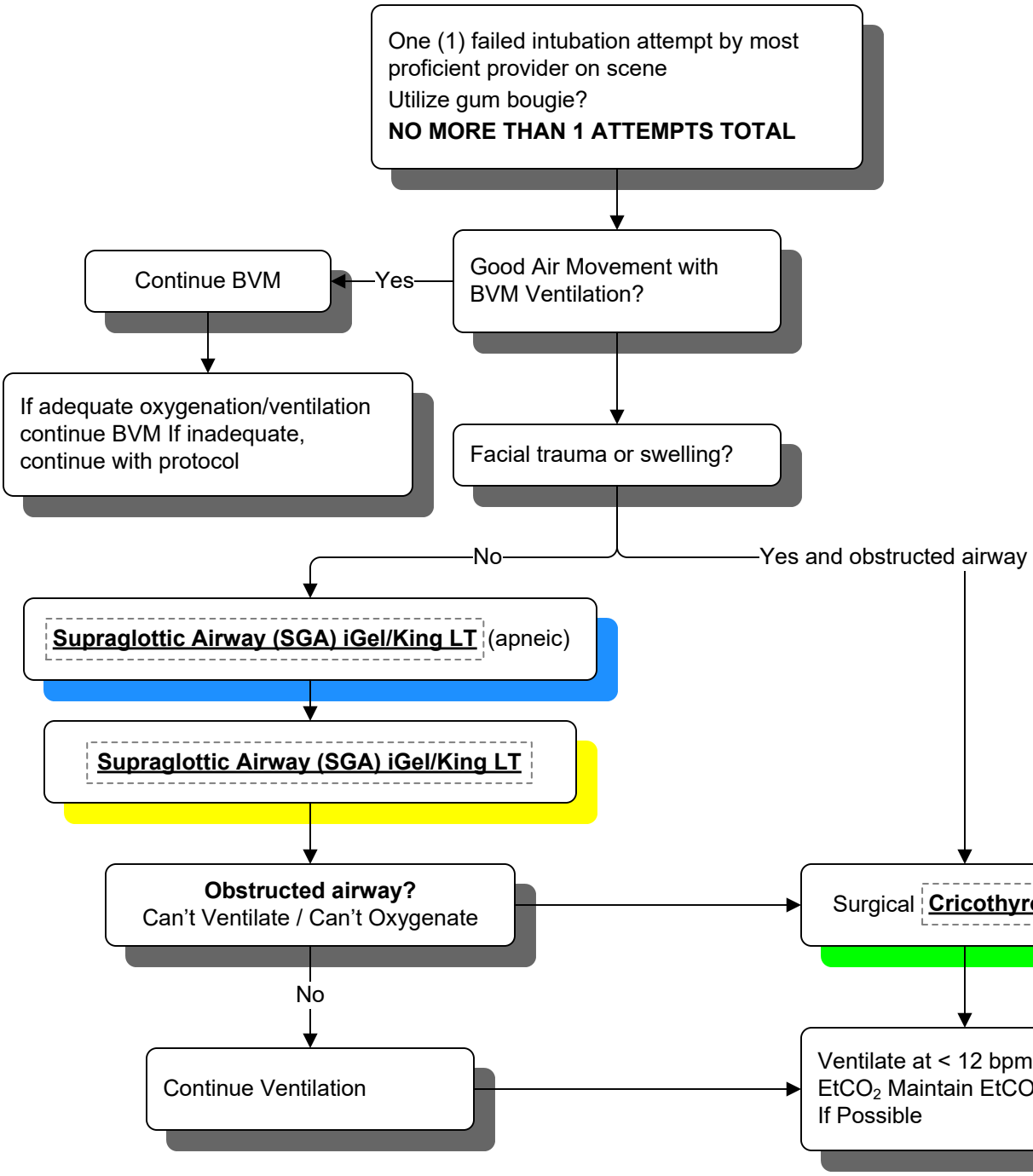
- For this protocol, Adult > 12 years old
- Capnometry is mandatory with all methods of intubation. Document results.
- **WAVEFORM CAPNOGRAPHY MANDATORY FOR ALL ADVANCED AIRWAYS (iGEL, KING LT, ETT)**
- Do not assume hyperventilation is psychogenic - use oxygen
- ELM = External Laryngeal Manipulation
- Use SGA = Supraglottic airway (King or iGel) when unable to intubate a patient. Avoid hypoxemia
- In head trauma, maintain $EtCO_2$ 35-45. Avoid overventilation. Avoid hypoxemia
- Utilize continuous pulse oximetry - All intubated patients must have a C-Collar in place. For non-trauma patients, remove collar upon transfer
- Bougie may be used on any attempt based on initial assessment

Adult RSI Procedure

RSI Checklist—ADULTS **RESUSCITATE BEFORE YOU INTUBATE**

	YES	NO	
1. Pull ambulance to stop if safe to do so; all personnel assisting	☐	☐	General
2. Optimize positioning 30 degree head up, collar off	☐	☐	
3. Denitrogenate/Oxygenate (NRB/CPAP/BVM with peep)	☐	☐	
4. Monitors mandatory: NIBP, SPO2, $EtCO_2$, ECG	☐	☐	EMR
5. Access: 2 reliable IV sites preferable	☐	☐	
6. Suction: On and tested	☐	☐	
7. Equipment: "Kit dump" • Video/Direct Laryngoscope on and tested • Tubes, Stylet, OPA, Tube tie • Failed airway equipment at bedside (Bougie, cric kit, SGA*)	☐	☐	EMT
8. **Meds: Induction** Normotensive = Ketamine (Ketalar) 2 mg/kg IVP **Maximum dose 200 mg** Hypotensive = Ketamine (Ketalar) 0.5 mg/kg IVP **Maximum dose 50 mg** 2nd Choice Etomidate (Amidate) 0.3 mg/kg IVP, IO **Maximum dose 30 mg**	☐	☐	AEMT
9. **Meds: Paralysis** Normotensive = Rocuronium (Zemuron) 1.2 mg/kg IVP Hypotensive = Rocuronium (Zemuron) 1.6 mg/kg IVP Secondary option= Succinylcholine (Anectine) 1.5 - 2 mg/kg IVP	☐	☐	Paramedic
10. **Meds: Post-Intubation** Fentanyl (Sublimaze) 2 mcg/kg IVP and... Midazolam (Versed) 0.05 mg/kg IVP or Ketamine (Ketalar) **Infusion** 1 - 2 mg/kg/hr Rocuronium (Zemuron) 0.6 - 1.2 mg/kg IVP Atropine 0.4 mg IVP, IO for excessive salvation due to Ketamine	☐	☐	Med Control
11. Epinephrine Push Dose for peri-intubation hypotension. Mix 1 mL of 1mg/10mL epinephrine with 9 mL of NS. Label syringe each mL = 10 mcg Give 1 - 2 mL every 3 minutes until MAP > 65			

Airway-Failed



Pearls

Continuous pulse Oximetry should be used in all patients with inadequate respiratory function

Continuous $EtCO_2$ should be applied to all patients with respiratory failure and to all intubated patients

Providers should consider using a King airway when unable to intubate a patient

AEMT's and EMT's may use the SGA only after attending approved in-service and completing practical examination

Notify OLMC as soon as possible about failed airway. MEDICAL DIRECTOR MUST BE CONTACTED WITHIN 24 HOURS TO DEBRIEF FAILED AIRWAY

Patient must have respiratory effort to perform naso-tracheal intubation

Allergic Reaction

History
- Onset/location
- Insect sting or bite
- Food allergy/exposure
- Medication allergy/exposure
- New clothing, soap
- Past history
- Medication history

Signs and Symptoms:
- Itching/hives
- Coughing/wheezing/respiratory distress
- Chest or throat tightening
- Difficulty swallowing
- Hypotension/shock
- Edema

Differential:
- Uticaria
- Anaphylaxis
- Shock
- Angioedema
- Aspiration
- Vasovagal
- Asthma/COPD
- CHF

General
EMR
EMT
AEMT
Paramedic
Med Control

Universal Patient Care

Hives/Rash only
No Respiratory component

IV/Cardiac Monitor

Diphenhydramine (Benadryl)
25 - 50 mg IVP, IM

Reassess

Respiratory Distress
Not in arrest/shock

IV/Cardiac Monitor

Epinephrine 1 mg/1 mL 0.3 mg IM
By Auto-Injector

Epinephrine 1 mg/1 mL 0.3 mg IM

Diphenhydramine (Benadryl)
25 - 50 mg IVP, IM

Methylprednisolone (Solu-Medrol)
125 mg IVP, IM

Impending
Arrest/Shock

Epinephrine 1 mg/1 mL
0.3 mg IM By Auto-Injector

OR

Epinephrine 1 mg/1 mL
0.3 mg IM

Anaphylaxis,
Epinephrine 1 mg/10 mL
0.3 mg (3 ml) IVP, IO

Hypotension Protocol

Arrhythmia Protocol

Respiratory Distress
Protocol

Pearls
Exam: Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Epinephrine may precipitate cardiac ischemia. Use caution when giving epi to patients greater than 50 years old. Perform ECG.
- Shorter the onset = more severe the reaction

Pulmonary Edema

History
- CHF
- Past medical history
- Medications (digoxin, lasix)
- Viagra, Levitra, Cialis
- Cardiac history (i.e.. MI)

Signs and Symptoms:
- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- JVD
- Pink, frothy sputum (late sign)
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential:
- MI
- CHF
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion/pneumonia
- PE
- Tamponade
- Toxic exposure

Universal Patient Care

Obtain $EtCO_2$ and Pulse Oximetry

Nitroglycerin 0.4 mg SL every 2 - 3 min
If systolic BP > 110

Adult IV Protocol

Apply **CPAP**

12 Lead ECG & transmit

Consider

Midazolam (Versed) 1 - 2 mg IVP OR 2 mg IN
if SBP > 100 for sedation if needed
or
Ketamine (Ketalar) 0.2 mg/kg IVP, IN, IM

Pearls

Exam: Mental status, skin, neck, heart, lungs, abdomen, back, extremities, neuro
- ***Early aggressive treatment of pulmonary edema with nitrates and CPAP avoids intubation***
- Pre-hospital use of diuretics is no longer indica**CPAP**
- Avoid Nitro in patient who has used Viagra or Levitra in past 24 hours or Cialis in past 36 hours
- Consider myocardial infarction in all of these patients (cardiogenic shock)
- Careful monitoring of LOC, BP, respiratory status with above interventions is essential
- Allow patient to remain in position of comfort to maximize breathing effort

Respiratory Distress

History
- Asthma
- COPD
- CHF
- Home treatment (oxygen/nebulizer)
- Meds (theophylline, steroids, inhalers)
- Toxic exposure
- Smoke inhalation

Signs and Symptoms:
- SOB
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi, rales, stridor
- Accessory muscle use
- Fever, cough, tachycardia

Differential:
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pneumonia/pleural effusion
- Pneumothorax
- Cardiac (MI/CHF)
- PE
- Tamponade
- Hyperventilation
- Inhaled toxin

General

EMR

EMT

AEMT

Paramedic

Med Control

Universal Patient Care

Respiratory insufficiency? Yes → **Adult Airway** Protocol

No

Position of Comfort

Rales/CHF → **Pulmonary Edema** Protocol

Wheezes → **Adult IV** Protocol

Stridor → **Adult IV** Protocol

Albuterol dosing
1) assist with patient's own prescription (MDI or nebulizer)
2) contact OLMC for verbal medical direction to give EMS supplied med (Nebulizer)

Albuterol (Proventil) 2.5 mg nebulized

DuoNeb aerosol (Albuterol/Atrovent)

Methylprednisolone (Solu-Medrol)
125 mg IVP, IM
Magnesium Sulfate 2 g IVP over 20 min

Contact **OLMC** if patient does not meet criteria for Epi See below

Consider **Epinephrine 1 mg/1 mL**
0.3 mg SQ, IM

3 ml nebulized saline

No improvement
Epinephrine 1 mg/10 mL
0.3 mg Neb Mix with
3 ml NS

For severe cases
Epinephrine 1 mg/10 mL
0.3 mg IVP

Pearls:
- EMT Basic's may assist patients with their own albuterol MDI
- Monitor pulse ox continuously - CPAP may be used for patients with COPD, CHF, Pneumonia, Asthma as per protocol
- Contact OLMC prior to administering epinephrine to patients > 50 years old, have a cardiac history, or heart rate > 150. Perform 12-lead ECG on these patients
- Monitor $EtCO_2$ continuously

Adult Toxicology
Adult Toxicology

Overdose/Toxic Ingestion

Adult Toxicology

History
- Ingestion or suspected ingestion of toxic substance
- Substance ingested, quantity, route
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

Signs and Symptoms:
- Mental status changes
- Hypotension/hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures

Differential:
- TCA's
- Acetaminophen
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, alcohols, cleaning agents
- Insecticides (organophosphates)

Treat and Release Opiate OD:
-Awake and alert and oriented after naloxone and refuses transport
-Return to baseline Mentation
-Pulse oximetry normal
-No other concerning factors
-Contact OLMC for report

Universal Patient Care

Adult IV Protocol

Tricylic Ingestion?
Sodium Bicarbonate 1 mEq/kg

Respiratory Depression?

EMR/EMT
Naloxone (Narcan)
2 mg IN

AEMT/Medic
Naloxone (Narcan)
0.4 - 2 mg IVP or
Narcan 2 mg IN

May repeat until breathing normally.

Chest Pain?

Chest Pain Protocol

Atropine
2 mg IVP q 5 min.
No Maximum dose

Other

Hypotension seizures venticular dysrhythmias or mental status changes

Appropriate protocol

General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls
Exam: Mental status, skin, HEENT, heart, lungs, abdomen, extremities, neuro
- Do not rely on patient history of ingestion in suicide attempt
- Bring bottles to ED
- TCA= tricyclic antidepressant: seizure, dysrhythmias, hypotension, decreased mental status, coma
- Acetaminophen: normal or N/V - causes irreversible liver failure if not detected
- Depressants: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- Stimulants: increased HR, increased BP, increased temperature, dilated pupils, seizures
- Anticholinergic: increased HR, increased temperature, dilated pupils, mental status change
- Cardiac meds: dysrhythmias, mental status changes
- Insecticides: increased/decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints per restraints procedures
- ALS units may transport patients who have received activated charcoal therapy

Opioid Overdose Sign Off

Below is the criteria in order to use the "**Opioid Overdose Sign Off**" Protocol
The following conditions must be true.

YES	NO	
☐	☐	A. The patient must never have been in cardiac arrest.
☐	☐	B. The patient must regain a normal mental and respiratory status after Naloxone (Narcan) administration of up to 4 mg via IM, IV, or IN route.
☐	☐	C. Once "awake", the patient must admit to isolated IV opioid/heroin overdose. Overdoses of Oxycontin and methadone are excluded.

If conditions A, B, and C are all met, and there is no other acute medical or traumatic condition requiring care, the patient is "medically clear" for consideration for alternate destination referral or the patient may sign a "refusal of care" from and refuse all further treatment and transport.

If the patient was ever in cardiac arrest, does not regain normal mental or respiratory status or requires more the 4 mg of Naloxone to do so, then the patient should be transported to an appropriate local emergency department. Transport to the Emergency Department should also be provided for patients who request it, and assistance should be provided to those patients who wish to be assessed and treated for substance abuse.

Burns

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- LOC

Signs and Symptoms:
- Burns, pain, swelling
- Dizziness
- LOC
- Hypotension/shock
- Airway compromise/distress
- Singed facial or nasal hair
- Hoarseness or wheezing

Differential:
- Superficial (1st degree) - red and painful
- Partial thickness (2nd degree) - blistering
- Full thickness (3rd degree) - painless/ charred leathery skin
- Chemical
- Thermal
- Electrical
- Radiation

Universal Patient Care

Remove rings, bracelets, and other constricting items

Thermal

If burn < 10% BSA (rule of 9's) Cool down wound with normal saline

Cover with dry sterile sheet or dressings

Adult IV Protocol
20 ml/kg Normal Saline or LR

Pain Control Protocol

Transport to nearest Trauma center

Chemical

Remove clothing or expose area. Brush off any visible dry chemical or powder

Eye involvement
Saline flush in affected eye
See **Eye Injury/Complaint**

Flush area with water or normal saline for 10 - 15 minutes

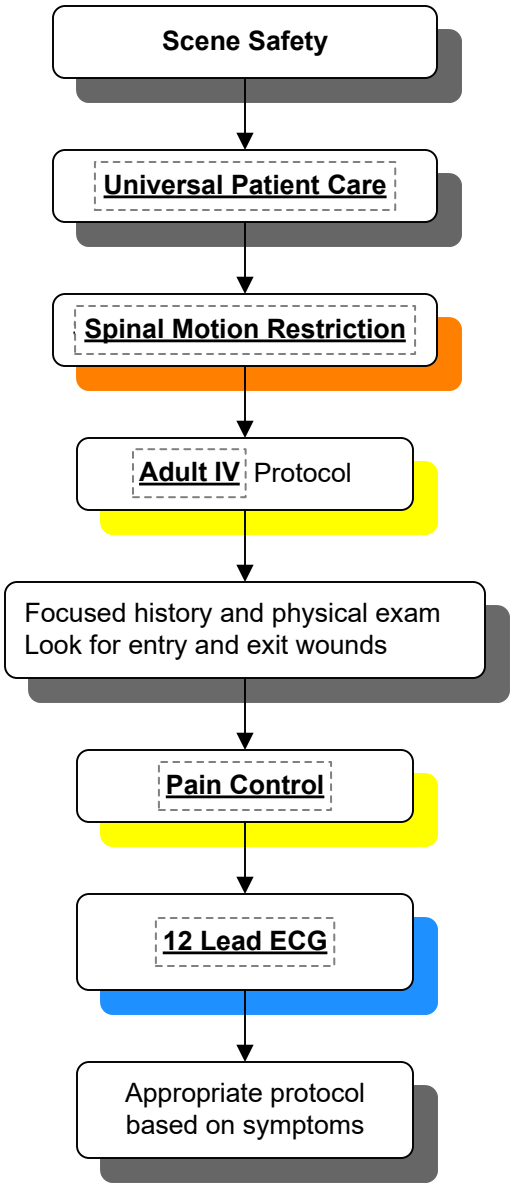
Pearls
Exam: Mental status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
Critical Burns: > 25% BSA; 3rd Degree burns > 10% BSA; 2nd or 3rd degree burns to face, eyes, hands or feet; electrical burns, respiratory burns, deep chemical burns, burns with extremes of age or chronic disease; burns associated with major traumatic injury. These burns require admission or transfer to a burn center.
Early intubation required in significant inhalation injuries
Treat potential CO exposure with 100% Oxygen
Circumferential burns to extremities are dangerous due to potential vascular compromise due to soft tissue swelling
Burn patients are prone to hypothermia
Do not overlook possibility of multi-system trauma
Do not overlook possibility of child abuse. **NOTE**: the palm of the patient = 1% total BSA burned

Electrical Injuries

History
- Lightning or electrical exposure
- Single or multiple victims
- Trauma from fall or MVC into pole
- Duration of exposure
- Voltage and current (AC/DC)

Signs and Symptoms:
- Burns
- Pain
- Entry and exit wounds
- Hypotension or shock
- Arrest

Differential:
- Cardiac arrest
- Seizure
- Burns
- Multiple trauma



Pearls
Exam: Mental status, HEENT, neck, heart, lungs, abdomen, extremities, back, neuro
- Ventricular fibrillation and asystole are most common dysrhythmias
- Damage often hidden - most severe damage to muscle, vessels, and nerves
- In multiple victim lightning incident, attend to victims in full arrest first. IF the victim did not arrest initially, it is likely they will survive. These patients are often resuscitated with adequate CPR and ALS
- Do not overlook other trauma
- Lightning is a massive DC shock, most often leading to asystole as the dysrhythmia
- In lightning injuries, most of the current will travel over the body surface producing flash burns

Extremity Trauma

Adult Trauma

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

Signs and Symptoms:
- Pain
- Swelling
- Deformity
- Altered sensation/motor function
- Diminished pulse/cap refill
- Decreased extremity temperature

Differential:
- Abrasion
- Confusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputations

Universal Patient Care

Isolated extremity injury?

No → **Multiple Trauma** Protocol

Yes

Immobilize extremity as indicated
Apply ice to reduce swelling

Minor Wound Care / Hemorrhage Control

- Direct Pressure first.
- Pack extremity wounds with hemostatic gauze.
- Do not pack abdominal wounds with hemostatic gauze.
- Arterial bleeding still not controlled? Apply Tourniquet.

Limb or life threatening event?
Pain medication needed?
Adult IV Protocol

Pain Control Protocol

Amputation?
Clean amputated part
Wrap part in sterile dressing soaked with normal saline. Place in air tight container. Place container on ice if available.

Pearls
Exam: Mental status, extremity, neuro
- In amputations, time is critical. Consider transport to Trauma center (see above note)
- Hip dislocation and knee and elbow fracture/dislocations have a high incidence of vascular compromise
- Urgently transport any injury with vascular compromise
- Blood loss may be concealed or not apparent with extremity injuries
- Severe bleeding not rapidly controlled may necessitate application of a tourniquet
- Lacerations must be evaluated for repair within 6 hours from the time of injury

Eye Injury/Complaint

Adult Trauma

History
- Time of injury/onset
- Blunt/penetrating/chemical
- Open vs. closed injury
- Involved chemical/MSDS
- Wound contamination
- Medical history
- Tetanus status
- Normal visual acuity
- Medications

Signs and Symptoms:
- Pain, swelling, blood
- Deformity, contusion
- Visual deficit
- Leaking aqueous/vitreous humor
- Upwardly fixed eye
- Shooting or streaking light
- Visible contaminants
- Lacrimation

Differential:
- Abrasion/laceration
- Globe rupture
- Retinal nerve damage detachment
- Chemical/thermal/agent of terror
- Orbital fracture
- Orbital compartment syndrome
- Neurological event
- Acute glaucoma
- Retinal artery occlusion

General

EMR

EMT

AEMT

Paramedic

Med Control

Universal Patient Care

Nature?

Pain/Visual

Assess visual acuity
Evaluate pupils

Complete neuro exam

Screen for unrecognized chemical exposure

Cover both eyes

Injury

Isolated to eye(s)?

No → **Appropriate protocol**

Out of socket

Cover with saline-soaked gauze

In socket

Mechanism

Burn/Chemical

Immediate irrigation with saline or water

Tetracaine 2 drops

Irrigate with normal saline

Cover unaffected eye eyes

Pain Control Protocol

Physical trauma

Assess Orbital Stability

Assess visual acuity when able

Penetrating trauma or globe rupture?

No

Yes

Ondansetron (Zofran)
4 mg IVP, IM, ODT

Ondansetron (Zofran)
4 ODT

Pearls
- Normal visual acuity can be present even with severe eye injury
- Remove contact lenses when possible
- Any chemical or thermal burn to the face/eyes should raise suspicion of respiratory insult
- Orbital fractures raise concern of globe or nerve injury and need repeated assessments of visual status
- Should cover both eyes to prevent injury
- Use shields for physical trauma to eyes (not pads)
- Do not remove impaled objects

Head Trauma

Adult Trauma

History
- Time of injury
- Mechanism: blunt/penetrating
- LOC
- Bleeding
- Medical history
- Medication
- Evidence of multi-trauma
- Helmet use/damage to helmet

Signs and Symptoms:
- Pain
- Swelling
- Bleeding
- Altered mental status
- Unconsciousness
- Respiratory distress/failure
- Vomiting
- Significant MOI

Differential:
- Skull fracture
- Brain injury (concussion, contusion, hemorrhage, laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

General

Remove helmet if indicated

Universal Patient Care

Multiple Trauma protocol

No

Isolated head trauma?

Yes

EMR

RSI procedure for approved departments in Procedures section

Spinal Motion Restriction

Adult IV Protocol
NS bolus to keep SBP >100

EMT

Obtain Glasgow Coma Score

GCS < 8
No gag reflex

GCS < 8 gag reflex present

GCS > 8

AEMT

Intubate apneic patients
Maintain $EtCO_2$ 35 - 45 mmHg
Resp 10/min.
Avoid ANY hypoxia and/or hypotension
Avoid overventilation

Assist with basic airway maneuvers

Maintain Pulse Oximetry > 90%

Paramedic

Midazolam (Versed) 2 - 5 mg IVP

Fentanyl (Sublimaze)
1 - 3 mcg/kg IVP for sedation/pain control

Ketamine (Ketalar) **Infusion**
1 – 2 mg/kg/hr

Seizure?
Go to **Seizure** protocol

Monitor and reassess

Med Control

Pearls
Exam: Mental status, skin, HEENT, heart, lungs, abdomen, extremities, back, neuro
Cushing's Response: Elevated ICP causing hypertension and bradycardia
- Hypotension usually indicates injury or shock unrelated to head injury and should be aggressively treated
- Monitor and document changes in LOC and GCS
- Consider restraints if necessary for safety of patient and/or personnel protection. Do not use Haldol
- Concussions are periods of confusion or LOC associated with trauma and may be resolved upon arrival of EMS
- Any prolonged period of confusion or mental status abnormality that does not return to normal within 15 minutes should be evaluated by a physician

Multiple Trauma

Adult Trauma

History
- Time and MOI
- Damage to structure/vehicle
- Location in structure/vehicle
- Others injured/dead
- Speed and details of MVC
- Restraints/protective equipment
- Past medical history
- Medications

Signs and Symptoms:
- Pain
- Swelling
- Altered mental status
- Unconscious
- Deformity
- Bleeding
- Hypotension/shock
- Arrest

Differential:
- Chest
  - Tension pneumothorax
  - Flail chest
  - Pericardial tamponade
  - Open chest wound
  - Hemothorax
- Intra-abdominal bleeding
- Pelvis/femur fracture
- Spine fracture/cord injury
- Head injury
- Extremity fracture/dislocation
- Airway obstruction
- Hypothermia

General

Universal Patient Care

Avoid ANY hypotension OR hypoxia in Head Trauma

Rapid trauma assessment and GCS

EMR

Minimize on-scene time

Tranexamic Acid (TXA)

Indications: Age >16
Uncontrolled Hemorrhage
SBP <90; HR >110
Time from injury <3 hours
Contraindications:
>3 hours from injury
On anticoagulants
Dosing: 1 gram/50 ml NS IV over 10 minutes
Transport to Designated Trauma Center

EMT

Spinal Motion Restriction

Adult IV Protocol

AEMT

Vital signs and perfusion

Abnormal

NS or LR bolus to maintain SBP 60 - 90 for Hemorrhagic Shock

Continued hypotension (SBP <90)? Permissive Hypotension (SBP 60-90 mmHg) Consider: Reduction of long bone fracture Pelvic binding with sheet for pelvic fracture Control of external hemorrhage (CAT tourniquet)

Consider
Chest Decompression

Anterior mid clavicular 2nd intercostal space

OR

Lateral anterior axillary line 4th intercostal space

Abnormal

Ongoing assessment

Consider **Pain Control** Protocol if SBP > 90 and GCS = 15

Paramedic

Med Control

Pearls
Exam: Mental status, HEENT, heart, lungs, abdomen, extremities, back, neuro
- In prolonged extrications/serious trauma, consider air transport
- Severe bleeding from an extremity not rapidly controlled may necessitate the appliation of a**TOURNIQUET**

Spinal Motion Restriction (SMR)

Adult Trauma

Low Risk Characteristics
Simple rear-end collision
Ambulatory on scene at anytime
No neck pain on scene
No midline cervical tenderness

These Low Risk Factors allow Safe Ommision of SMR in Patients with GCS = 15

Potential mechanism for unstable spine Injury?

High Risk Characteristics
Age>65
Trauma Triage Criteria
Axial Loads/Diving injury
Sudden Accel/Deceleration
Lateral bending forces to neck or torso
Violent impact to head, neck, torso, pelvis
Numbness, tingling, Paresthesia
If Any of the Above, Strongly consider SMR

Yes

Altered LOC
(GCS <15)??
Unreliable interaction?

All No

Any
Yes

Apply SMR

Spinal Tenderness?
OR
Anatomic deformity of spine?
Or
Neurologic deficit or complaint

Any
Yes

Possible spine injury
Apply SMR

No

OMIT SMR

Unreliable Patient Interactions
-Language barriers, inability to communicate
-Lack of cooperation during exam
-Evidence of drug/alcohol intoxication
-Painful distracting injury such as long-bone fracture

Motor/Sensory Exam
-Wrist/Hand extension bilaterally
-Foot plantarflexion bilaterally
-Foot dorsiflexion bilaterally
-Gross sensation in all extremities
-Check for paresthesias

Trauma Arrest

Adult Trauma

History
-Patient who has suffered a traumatic injury and is now pulseless

Signs and Symptoms
- Evidence of penetrating trauma
- Evidence of blunt trauma

Differential:
- Medical condition preceding traumatic event as cause of arrest
- Tension pneumothorax
- Hypovolemic shock
  - External hemorrhage
  - Unstable pelvic fracture
  - Displaced long bone fracture
  - Hemothorax
  - Intra-abdominal hemorrhage
  - Retroperitoneal hemorrhage

Universal Patient Care

Patient with injury obviously incompatible with life or traumatic arrest in asystole

Yes → Do not attempt resuscitation
Contact law enforcement

No

Spinal Motion Restriction Protocol

Open Airway: iGel or ETT

Adult IV/IO

LR or NS Fluid Bolus

Bind pelvis with commercial binder

Pull lower extremities to length if deformity present

Control all external hemorrhage

Decompress bilateral chest (Anterior 2nd intercostal space or Lateral 4th intercostal space)

Return of pulse?

Yes → Go to appropriate protocol

No

Continue fluid bolus
Reduce long bone fractures
Bind pelvis
Control external hemorrhage

Bilateral **Needle Chest Decompression**
2nd intercostal space mid clavicular
OR 4th intercostal space anterior axillary line

General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls
Injuries obviously incompatible with life include decapitation, massively deforming head or chest injuries or other features of a patient encounter that would make resuscitation futile. If in doubt, place patient on monitor.
Consider using medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of arrest

Pediatric Universal Care

Pediatric Assessment

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

PPE (consider airborne or droplet precautions)

Initial Assessment

BLS: Consider Spinal Motion Restriction
For pediatrics, use Broselow tape
Use age/length based dose calculator

Cardiac Arrest → **Cardiac Arrest** Protocol

Pediatric Airway Protocol

Consider **Pulse Oximetry, Capnography**

Supplemental **Oxygen**

Vital Signs

Temperature and Blood Glucose
As indicated

Consider:
Cardiac monitor / **12 Lead ECG**

Appropriate Protocol

Transport patient per
Patient Transport Policy

Patient doesn't fit a protocol?
Contact **OLMC**

General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls
- Any patient contact that does not result in transport requires documentation and disposition
- Required vital signs on every patient include BP, pulse, RR, pain/severity
- Pulse oximetry, glucose measurement and temperature documentation is dependent on complaint
- Timing of transport based on patient's clinical condition

Pediatric Bradycardia

Pediatric Cardiovascular

History
- Past medical history
- Foreign body?
- Respiratory distress or arrest
- Apnea
- Possible toxin exposure
- Congenital disease
- Medication (maternal or infant)

Signs and Symptoms:
- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered LOC

Differential:
- Respiratory distress
Foreign body
Secretions
Infection/sepsis
- Hypovolemia
- Congenital heart disease
- Trauma
- Hypothermia
- Toxin ingestion
- Hypoglycemia

General

Pediatric Universal Care

Pediatric Airway Protocol

EMR

Poor perfusion
Decreased blood pressure
Respiratory insufficiency

Monitor and reassess

EMT

Pediatric IV

20 ml/kg fluid bolus NS

Repeat as needed

AEMT

No improvement
After 2 boluses?

Epinephrine 1 mg/10 mL 0.01 mg/kg IV, IO **Max. 1 mg**

Epinephrine 1 mg/1 mL 0.1 mg/kg ET

Repeat every 3 - 5 min **Maximum = 1 mg/dose**

Consider external **Transcutaneous Pacing**

Paramedic

Consider **Atropine** 0.02 mg/kg

Reassess

Pediatric Pulseless Arrest Protocol

Consider
Dextrose 25% 1 - 2 ml/kg slow IVP
Maximum 25 ml
Glucagon 0.025 mg/kg IM **Maximum 1 mg**
Naloxone (Narcan) 0.2 mg/kg IVP, IM, IN, IO prn
Maximum 2 mg
Normal saline 20 ml/kg bolus (repeat prn)

EMR, EMT, can administer Narcan (IN & Auto-Injector only)

Med Control

Pearls **Exam**: Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neuro
- Infant = < 1 year of age
- Most maternal medications pass through breast milk to infant
- The majority of pediatric arrests are due to airway problems
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia
- Minimum atropine dose is 0.1 mg IV/IO

Pediatric Pulseless Arrest

Pediatric Cardiovascular

History
- Time of arrest
- Medical history
- Medications
- Foreign body?
- Hypothermia?
- Suspected abuse?
- SIDS

Signs and Symptoms:
- Unresponsive
- Cardiac arrest

Differential:
- Respiratory failure
  - Foreign body
  - Secretions
  - Infection
- Hypovolemia
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin ingestion
- Hypoglycemia
- Acidosis

General

EMR

EMT

AEMT

Paramedic

Med Control

Pediatric Universal Care

V.Fib/Pulseless V-Tach

Defibrillate
1st 2 J/kg
2nd 4 J/kg
3rd 4 J/kg

Pediatric Airway Protocol

Pediatric IV/IO

Epinephrine 1 mg/10 mL
0.01 mg/kg IV, IO **Max. 1 mg (10 ml)**
OR
Epinephrine 1 mg/1 mL 0.1 mg/kg ET
Repeat every 3 - 5 minutes

Defibrillate 4 J/kg every 1 - 2 minutes

Consider **Amiodarone (Cordarone)** 5 mg/kg IVP, IO

Consider **Lidocaine (Xylocaine)** 1 mg/kg IVP, IO

Asystole/PEA

Pediatric Airway Protocol

Pediatric IV/IO

Epinephrine 1 mg/10 mL
0.01 mg/kg IV, IO **Max. 1 mg (10 ml)**
OR
Epinephrine 1 mg/1 mL 0.1 mg/kg ET
Repeat every 3 - 5 minutes

Dextrose 25% 1 - 2 ml/kg IV, IO
Naloxone (Narcan) 0.1 mg/kg IV, IO, ETT

Consider and treat causes
- Hypoxemia - oxygen
- Acidosis - oxygen, **Sodium Bicarbonate** 1 mEq/kg IVP, IO
- Volume depletion - fluid bolus 20 ml/kg
- Tension pneumothorax
- Hypothermic
- Hypoglycemia - D25 1 - 2 ml/kg IVP, IO

EMR, EMT, can administer Narcan (IN & Auto-Injector only)

Pediatric Pulseless Arrest-NOTES

Pediatric Cardiovascular

Pearls

- Max doses: Epi = 1 mg; Amiodarone = 300 mg; D25 = 25 ml; Narcan = 2 mg; Sodium Bicarbonate = 50 meq;)
- For success to occur, a cause must be identified and corrected
- For ROSC, go to post resuscitation protocol

Pediatric Supraventricular Tachycardia

Pediatric Cardiovascular

History
- Past medical history
- Medications or toxin ingestion (Aminophylline, diet pills, thyroid pills, decongestants, digoxin)
- Drugs - nicotine, cocaine
- Congenital heart disease
- Respiratory distress
- Syncope or near syncope

Signs and Symptoms:
- HR > 180 in child
- HR > 220 in infant
- Pale/cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered LOC
- Pulmonary congestion
- Syncope

Differential:
- Heart disease (congenital)
- Hypo/hyperthermia
- Hypovolemia/anemia
- Electrolyte abnormality
- Anxiety/pain/stress
- Fever/infection/sepsis
- Hypoxia
- Hypoglycemia
- Medication/toxin/drugs
- PE
- Trauma/tension pneumothorax

Pediatric Universal Care

Continuous cardiac monitor
Identify cause

Stable

Vagal Maneuvers
Ice pack to face or valsalva

Pediatric IV

Adenosine (Adenocard)
0.1 mg/kg IVP
0.2 mg/kg IVP and
0.3 mg/kg IVP
Flush each with 5 ml NS

If rhythm changes go to appropriate protocol

Unstable

Cardioversion 0.5 J/kg
Consider **Midazolam (Versed)** 0.1 mg/kg IVP, IN
up to **Maximum 2 mg**

Repeat **Cardioversion**
1 - 2 J/kg

Pediatric IV

Adenosine (Adenocard)
0.1 mg/kg IVP
0.2 mg/kg IVP and
0.3 mg/kg IVP
Flush each with 5 ml NS

Pearls: **DO NOT DELAY CARDIOVERSION FOR SEDATION IN UNSTABLE PATIENT.**
Exam: Mental status, skin, neck, lung, heart, abdomen, back, extremities, neuro
- Carefully evaluate the rhythm to distinguish Sinus Tach, SVT, and V-Tach
- Separating the child from caregiver may worsen clinical condition
- Use pediatric hands-free paddles in children < 10 kg or Broselow color purple
- Monitor for respiratory depression and hypotension with Versed use
- Continuous pulse oximetry required
- Document all rhythm changes
- Maximum sinus tachycardia rate is 220 - patient age in years

Pediatric Vomiting/Diarrhea

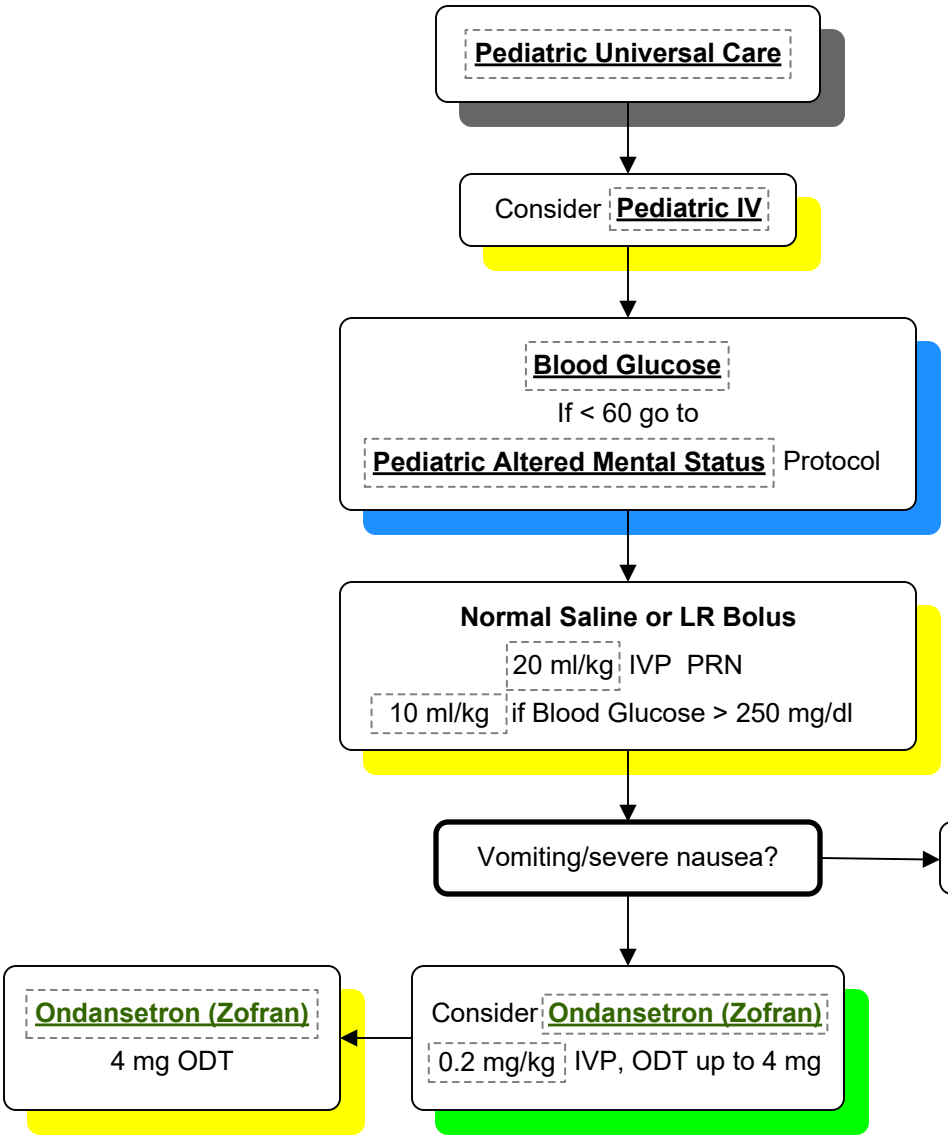
Pediatric Gastrointestinal

History
- Age
- Last meal
- Last BM/emesis
- Duration
- Sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history
- Travel history
- Bloody emesis/diarrhea

Signs and Symptoms:
- Pain Constant, sharp, dull, etc.
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

Associated Symptoms:
- Fever, Headache, blurred vision, weakness, myalgias, cough, dysuria, mental status changes, rash

Differential:
- CNS
- MI
- Drugs
- GI/renal
- DKA
- Gynecologic
- Infections
- Electrolyte imbalance
- Food or toxin induced
- Medication/substance abuse
- Pregnancy
- Psychologic



General
EMR
EMT
AEMT
Paramedic
Med Control

Pearls
Exam: Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neuro
- Monitor frequently to reassess vascular status

Pediatric Hypotension/Shock Non-Trauma

Pediatric General Medical

History
- Blood loss
- Fluid loss - Vomiting, diarrhea, fever
- Infection
- Medications
- Allergic reaction
- Poor PO intake history

Signs and Symptoms:
- Restless, confused
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Rapid pulse
- Decreased BP

Differential:
- Trauma
- Infection
- Dehydration
  - Vomiting
  - Diarrhea
  - Fever
- Congenital heart disease
- Medication or toxin

General

EMR

EMT

AEMT

Paramedic

Med Control

Pediatric Universal Care

Pediatric Multiple Trauma Protocol

Yes — Evidence or history of trauma

No

Blood Glucose

Pediatric IV/IO

Administer if Hypoglycemic < 60 mg/dl

Dextrose 25% 1 - 2 ml/kg IVP

Glucagon 0.025 mg/kg IM (if no IV)

(EMT permitted to administer)

Pediatric IV/IO

Normal Saline or LR Bolus

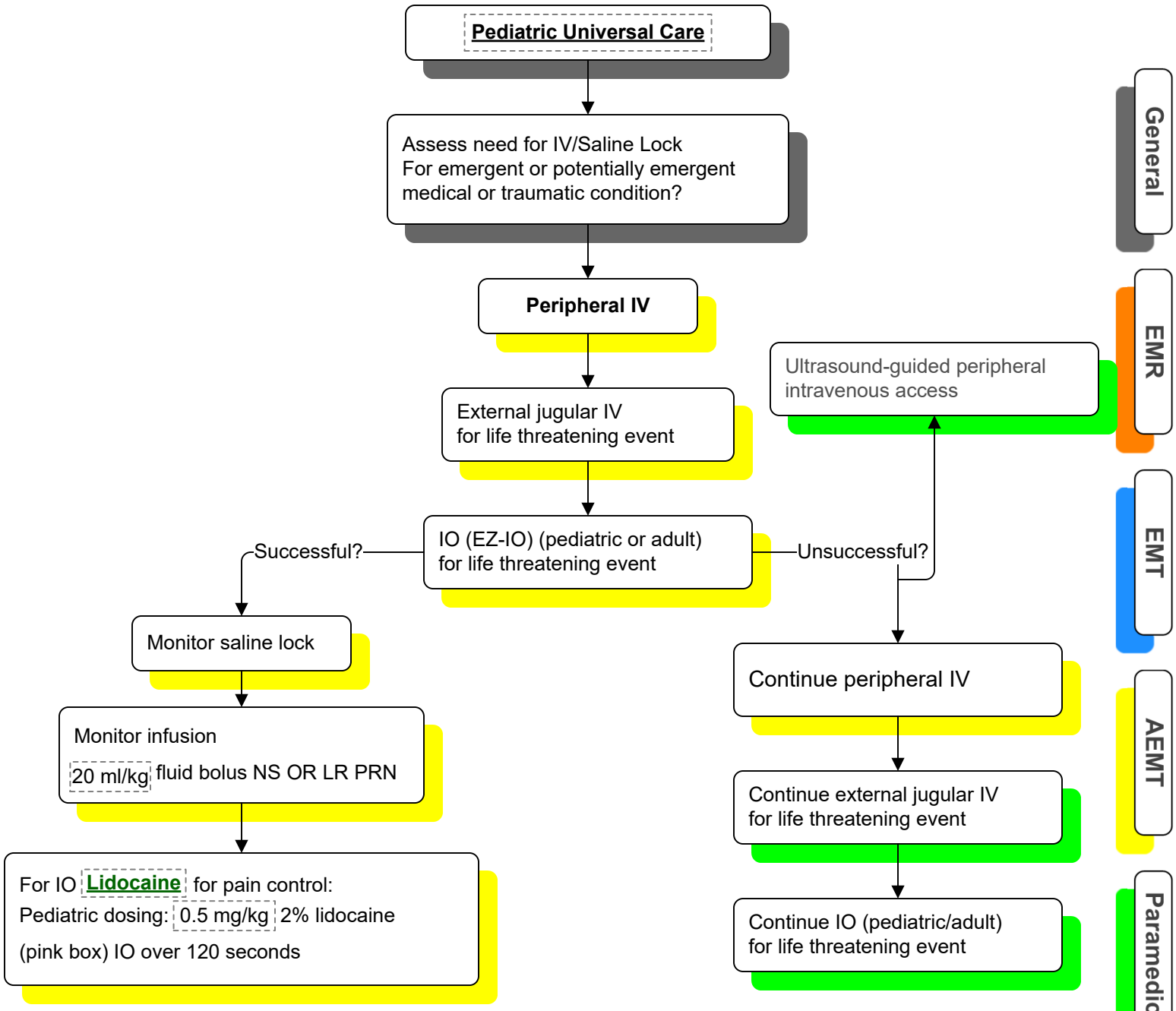
20 ml/kg

May repeat prn x 1

Pearls

Exam: Mental status, skin, heart, lungs, abdomen, back, extremities, neuro
- Max dose of D25 = 25 ml per dose, glucagon = 1 mg
- Consider all causes of shock and treat per appropriate protocol
- Decreasing heart rate is a sign of impending collapse

Pediatric IV/IO



Pearls

- IO with EZIO for adult or pediatric patient for cardiac arrest or unresponsive patient with no available IV site
- Saline locks are preferred unless fluid bolus anticipated
- External jugular (>12 years old)
- Any pre-hospital fluids or medications approved for IV use may be given through IO
- All rates KVO unless giving fluid bolus
- Use microdrips for patients under 6 years old (if available)
- External jugular lines can be attempted initially in life-threatening events with no obvious peripheral site
- In CARDIAC ARREST, pre-existing dialysis shunt or external central venous catheter may be used
- In patients who are hemodynamically unstable or in extremis, contact OLMC prior to accessing dialysis catheter or central catheters
- Any venous catheter which has already been accessed prior to EMS arrival may be used
- Upper extremity preferred to lower extremity IV sites
- In post mastectomy patients, avoid IV/injection or blood pressure in arm on affected side

Pediatric Pain Control

History
- Age
- Location
- Duration
- Severity (1-10)
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms:
- Severity
- Quality
- Radiation
- Relation to movement
- Increased with palpation

Differential:
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural/respiratory
- Neurogenic
- Renal

Pediatric Universal Care

Care based on complaint specific protocol

Cardiac Monitor, $EtCO_2$ and SpO_2 Monitoring for all Patients when using Narcotics

Pain severity > 6/10
OR
Indication for IV, IM pain medication?

Pediatric IV
Pulse Oximetry

Isolated extremity traumatic pain

Yes

Morphine 0.1 mg/kg IV, IM
May repeat in 10 minutes x 1
or
Fentanyl (Sublimaze) 0.5 - 1 mcg/kg IV, IN
or
Ketamine (Ketalar) 0.2 mg/kg IV Infusion.
Maximum 1st dose 20 mg mixed in 50 mL NS over 10 minutes IV

No

Contact OLMC

Pearls
- Max dose Morphine = 2 mg/dose
- Pain severity is a vital sign and must be recorded pre and post IV/IM pain medications
- Vitals should be obtained pre, post, and at disposition with all pain medications
- Contraindications to Morphine = hypotension, altered mental status, head injury, respiratory distress, severe COPD
- Document drug allergies
- Observe for drug reaction

Pediatric Newly Born

Pediatric Neonatal

History
- Due date and gestational age
- Multiple gestation (twins, etc)
- Meconium
- Delivery difficulties
- Congenital disease
- Maternal medications
- Maternal risk factors
  - Smoking
  - Substance abuse

Signs and Symptoms:
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

Differential:
- Airway failure
  - Secretions
  - Respiratory drive
- Infection
- Maternal med effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia

Dry infant and keep warm
Bulb suction mouth and nose

Yes

Nasopharyngeal suctioning

Dry infant and keep warm
Bulb suction mouth and nose

Stimulate infant and note APGAR score

See: **APGAR** Score in Tools

Respirations present?

Heart Rate?

Bag 30 seconds with 100% O_2

Reassess heart rate and APGAR
Give report to receiving hospital

HR < 60

Pediatric Airway Protocol / **CPR**

Pediatric IV Protocol

Appropriate dysrhythmia protocol

HR 60 - 100

Pediatric Airway Protocol

HR 80 - 100

Reassess heart rate

HR > 100

Pediatric IV Protocol

HR > 100

Monitor and reassess

Continue **Oxygen**

Consider

Dextrose **10%** 1 - 2 ml/kg IVP, IO

Naloxone (Narcan) 0.1 mg/kg IVP, IO

NS bolus 20 ml/kg IVP, IO

EMR, EMT, can administer Narcan (IN & Auto-Injector only)

Pearls
- Maternal sedation/narcotics will sedate the infant
- Consider hypoglycemia in infant - Document 1 and 5 minute APGARs
- D12.5% = D50 diluted to 1/4 strength (1 mL D50 with 3 mL saline)

General

EMR

EMT

AEMT

Paramedic

Med Control

Pediatric Altered Mental Status

Pediatric Neurological

History
- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or ingestion
- Past medical history
- Medications
- History of trauma

Signs and Symptoms:
- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin, fruity breath)
- Kussmaul respiration, dehydration

Differential:
- Head trauma
- CNS (CVA, tumor, seizure, infection)
- Infection
- Thyroid
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper/hypoglycemia)
- Toxicologic
- Acidosis/Alkalosis
- Environmental exposure
- Pulmonary
- Electrolyte abnormality
- Psychiatric

General

Pediatric Universal Care

Spinal Motion Restriction Protocol

EMR

Pediatric IV

EMT

Blood Glucose

Glucose < 60 mg/dl

<28 Days Old
Dextrose 10% 2 ml/kg IVP, IO
> 28 Days Old
Dextrose 10% 1 - 2 ml/kg IVP, IO
If no IV access
Glucagon 0.025 mg/kg IM
(EMT permitted to administer)

Glucose 60 – 250 mg/dl

Naloxone (Narcan)
0.1 mg/kg IV, IN, IM
If respiratory depression
EMT may administer IN only

Glucose > 250 mg/dl dehydration

Normal Saline or LR Bolus
10 ml/kg

AEMT

Return to baseline?

Yes

Consider other causes:
Head injury OD
CVA Hypoxia
ALTE (apparent life-threatening event)

If signs of shock
Normal saline bolus
20 ml/kg IV

Paramedic

If yes, patient may refuse transport without OLMC order. IF:
Adult present with patient
Blood glucose > 100
Patient. able to eat meal now
No history of oral hypoglycemic med use

Consider :
Dextrose 10% 1 - 2 ml/kg
Naloxone (Narcan) 0.1 mg/kg IV, IM, IN, ET
Glucagon 0.025 mg/kg IM

EMR, EMT, can administer Narcan (IN & Auto-Injector only)

Med Control

Pearls
Exam: Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neuro
- Be aware of AMS as sign of environmental toxin or Haz-Mat exposure
- Safer to assume hypoglycemia than hyperglycemia if doubt exists
- Low glucose < 60, Normal glucose 60-120, High glucose > 250

Pediatric Seizure

History
- Fever
- Previous seizure history
- Reported seizure activity
- History of recent head trauma
- Congenital abnormality

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

Differential:
- Fever
- Infection
- Head trauma
- Medication/toxin
- Hypoxia/respiratory failure
- Hypoglycemia
- Metabolic abnormality/acidosis
- Tumor

Pediatric Universal Care

Pediatric Airway Protocol

Fever? — Yes → Cooling measures

No

Pediatric IV

Blood Glucose < 60 mg/dl

<28 Days Old

Dextrose **10%** 2 ml/kg IVP, IO

> 28 Days Old

Dextrose **10%** 1 - 2 ml/kg IVP, IO

If no IV access

Glucagon 0.025 mg/kg IM

(EMT Permitted to administer)

Repeat Seizures or Status

Midazolam (Versed)

0.05 - 0.1 mg/kg IVP

Maximum dose 5 mg/dose

If no IV

Midazolam (Versed)

0.2 mg/kg IM, IN

Maximum dose 5 mg/dose

Active seizure? — Yes →

Midazolam (Versed)

0.05 - 0.1 mg/kg IVP

Maximum 5 mg/dose

If No IV

Midazolam (Versed)

0.2 mg/kg IM, IN

Maximum dose 5 mg/dose

Evidence of shock or trauma?
Go to appropriate protocol

Pearls

Max dose of D25 = 25 ml, max dose of glucagon = 1 mg

Status Epilepticus - > 2 successive seizures without a period of consciousness or recovery

Grand mal - generalized - LOC, incontinence, tongue trauma

Focal seizures (petit mal) - only a part of the body affected and not associated with LOC

Jacksonian seizures - focal seizures that become generalized

- Be prepared to assist ventilation if Versed is used
- Immobilize the spine if there is suspicion of trauma
- In an infant, a seizure may be the only evidence of a closed head injury

General

EMR

EMT

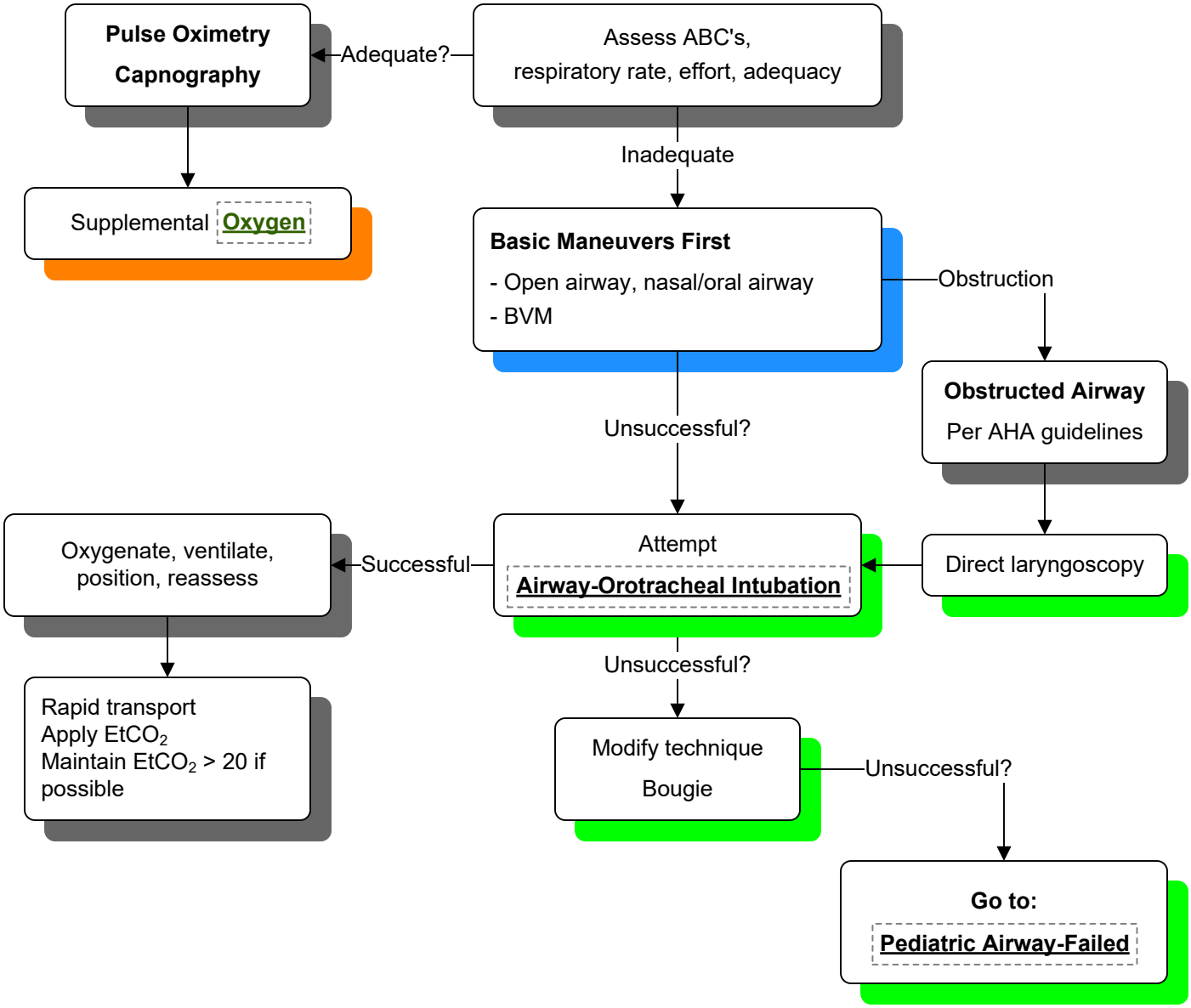
AEMT

Paramedic

Med Control

Pediatric Airway

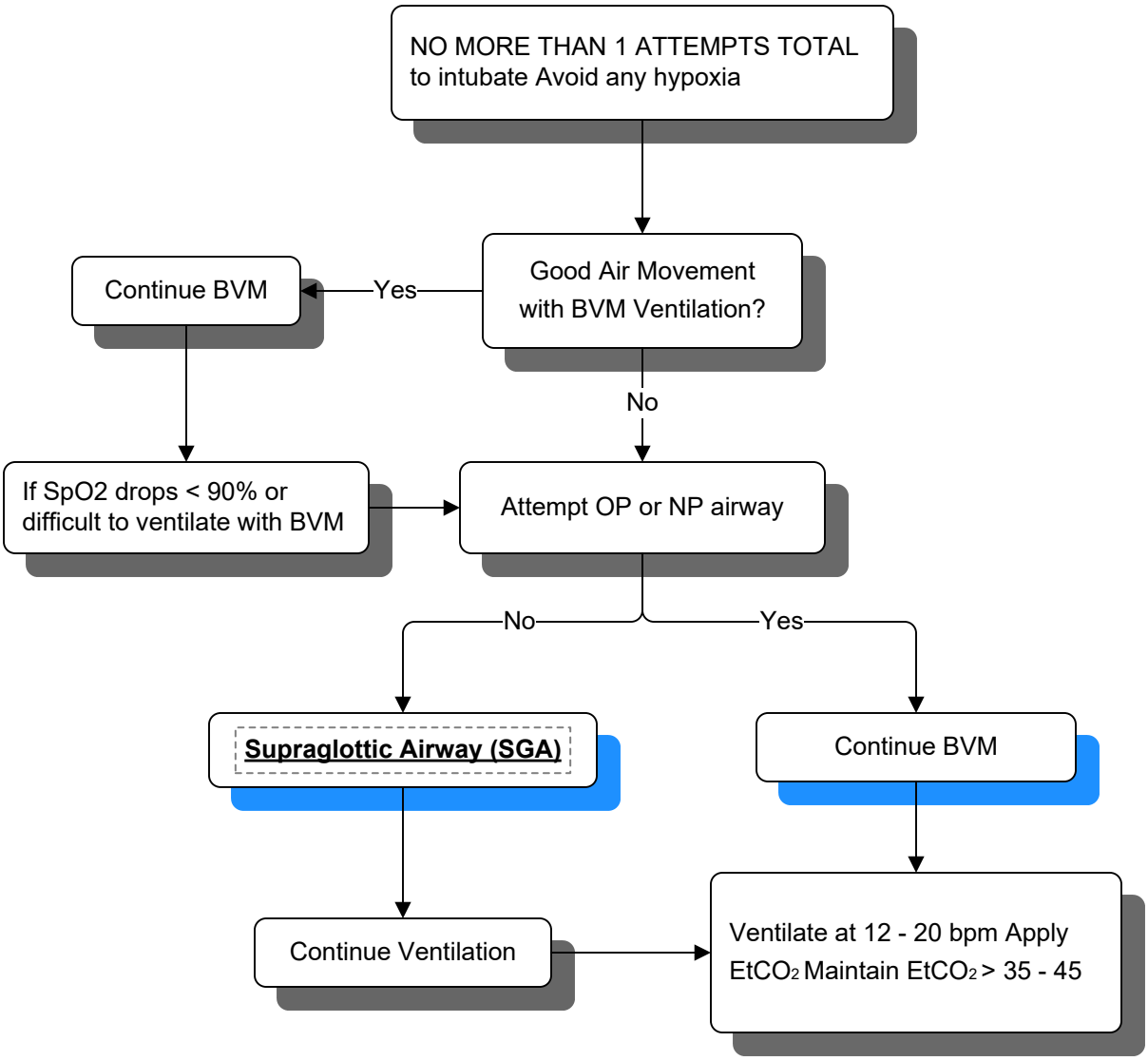
Pediatric Respiratory



Pearls
- For this protocol, pediatric = < 12 years old
- Capnometry is mandatory with all methods of intubation. Document results.
- If adequate oxygenation and ventilation with BVM, acceptable to defer intubation until arrival at hospital
- Nasal cannula $EtCO_2$ should be utilized to monitor BVM ventilations
- Limit intubation attempts to 1 per patient
- Maintain C-spine immobilization for patients with suspected spine injury
- Use ELM = External laryngeal manipulation
- Use continuous pulse oximetry
- Consider a C-collar to maintain ETT for intubated patients; remove in ER upon transfer

Pediatric Airway-Failed

Pediatric Respiratory



Pearls
If first intubation attempt fails, use BVM ventilations, or SGA (supraglottic airway) = iGel or King LT
Avoid any hypoxia

Continuous pulse oximetry should be used in all patients

Notify OLMC as early as possible about difficult/failed airway

Pediatric Allergic Reaction

Pediatric Respiratory

History
- Onset/location
- Insect sting or bite
- Food allergy/exposure
- Medication allergy/exposure
- New clothing, soap
- Past history
- Medication history

Signs and Symptoms:
- Itching/hives
- Coughing/wheezing/respiratory distress
- Chest or throat tightening
- Difficulty swallowing
- Hypotension/shock
- Edema

Differential:
- Urticaria
- Anaphylaxis
- Shock
- Angioedema
- Aspiration
- Vasovagal
- Asthma/COPD
- CHF

General

Pediatric Universal Care

Hives/Rash only
No Respiratory component

Impending Arrest/Shock

Respiratory Distress
Not in Arrest/Shock

EMR

Pediatric IV
Cardiac Monitor

Diphenhydramine (Benadryl)
1 mg/kg IV, IM

Reassess

Pediatric IV
Cardiac Monitor

Epinephrine 1 mg/1 mL
0.01 mg/kg IM **Maxi. 0.3 mg**
Epi-Pen (see note below)

Diphenhydramine (Benadryl)
1 mg/kg IV, IM

EMT

Epinephrine 1 mg/1 mL
0.01 mg/kg IM
Maximum 0.3 mg
Epi Pen (see note below)

Epi-Pen
Epi-Pen Jr if pt < 60 lbs
Epi-Pen if patient > 60 lbs or
Epi-Pen Jr not available

AEMT

Methylprednisolone (Solu-Medrol) 1 mg/kg IVP, IM

Paramedic

Anaphylaxis **Epinephrine 1 mg/10 mL**
0.01 mg/kg to **Max. 0.3 mg** PRN
Epi Pen (see note to the right)

Hypotension

Respiratory Distress

Dysrhythmia?

Med Control

Hypotension

Arrhythmia Protocol

Pediatric Respiratory Distress
Protocol

Pearls
Exam: Mental status, skin, neck, heart, lung, abdomen, back, extremities, neuro
- Any patient with respiratory symptoms or extensive reaction should receive epinephrine and IV/IM Benadryl
- Shorter the onset = more severe the reaction

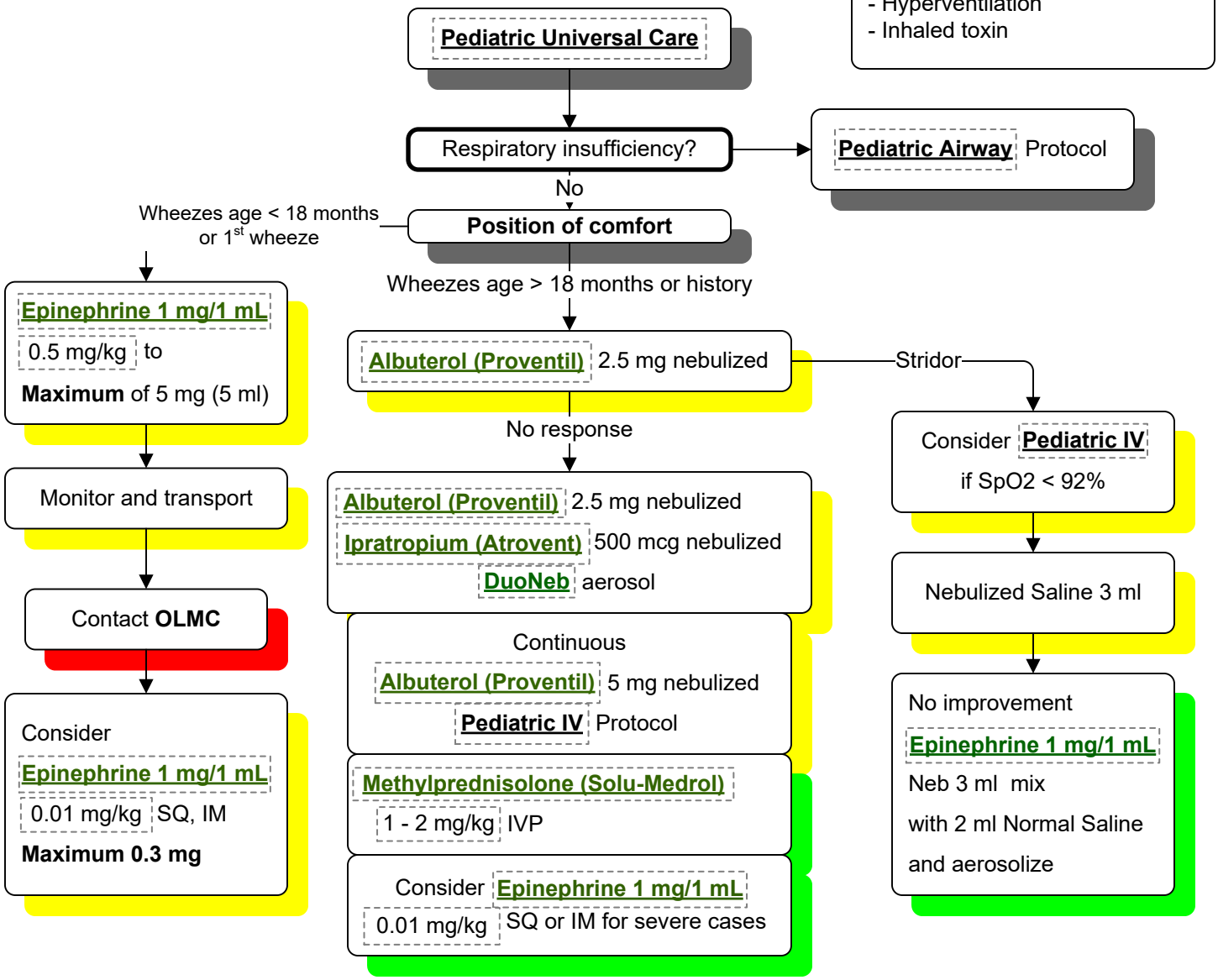
Pediatric Respiratory Distress

Pediatric Respiratory

History
- Asthma
- COPD
- CHF
- Home treatment (oxygen/nebulizer)
- Meds (theophylline, steroids, inhalers)
- Toxic exposure
- Smoke inhalation

Signs and Symptoms:
- SOB
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi, rales, stridor
- Accessory muscle use
- Fever, cough, tachycardia

Differential:
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pneumonia/pleural effusion
- Pneumothorax
- Cardiac (MI/CHF)
- PE
- Tamponade
- Hyperventilation
- Inhaled toxin



Pearls
- Pulse oximetry should be monitored continuously
- Do not force a child into a position. They protect their airway by body position
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to albuterol
- Croup typically affects children < 2 yrs old. It is viral and may be associated with fever, gradual onset, no drooling
- Epiglottitis typically affects children > 2 yrs old. It is bacterial, with fever, rapid onset, possible stridor, and common drooling
- For patients on **Xopenex**, you may continue a treatment in place of albuterol. Use patient meds and dosing (0.3mg-1.25mg) neb

Pediatric RSI Procedure

	YES	NO	
1. Pull ambulance to stop if safe to do so; all personnel assisting	☐	☐	General
2. Optimize positioning 30 degree head up, collar off	☐	☐	
3. Denitrogenate/Oxygenate (NRB/CPAP/BVM with peep)	☐	☐	
4. Monitors mandatory: NIBP, SPO_2, $EtCO_2$, ECG	☐	☐	EMR
5. Access: 2 reliable IV sites preferable	☐	☐	
6. Suction: On and tested	☐	☐	
7. Equipment: "Kit dump" • Video/Direct Laryngoscope on and tested • Tubes, Stylet, OPA, Tube tie • Failed airway equipment at bedside (Bougie, cric kit, SGA*)	☐	☐	EMT
8. **Meds: Induction** Normotensive = Ketamine (Ketalar) 2 mg/kg IVP Hypotensive = Ketamine (Ketalar) 0.5 mg/kg IVP	☐	☐	AEMT
9. **Meds: Paralysis** Normotensive = Rocuronium (Zemuron) 1.2 mg/kg IVP	☐	☐	
10. **Meds: Post-Intubation** Fentanyl (Sublimaze) 2 mcg/kg IVP 1st dose **Maximum 50 mcg** and... Midazolam (Versed) 0.05 mg/kg IVP 1st dose **Maximum 2 mg** Ketamine (Ketalar) **Infusion** 1 mg/kg/hr Atropine 0.2 - 0.4 mg IVP, IO for excessive salvation due to Ketamine	☐	☐	Paramedic
			Med Control

Pediatric Toxicology
Pediatric Toxicology

Pediatric Overdose/Toxic Exposure

Pediatric Toxicology

History
- Ingestion or suspected ingestion of toxic substance
- Substance ingested, quantity, route
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

Signs and Symptoms:
- Mental status changes
- Hypotension/hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures

Differential:
- TCA's
- Acetaminophen
- Depressants
- Stimulants
- Anticholinergic
- Cardiac meds
- Solvents, alcohols, cleaning agents
- Insecticides (organophosphates)

General

Pediatric Universal Care

EMR

Pediatric IV

EMT

Tricyclic ingestion with cardiac arrhythmia?
Sodium Bicarbonate 1 mEq/kg IVP, IO

Respiratory Depression?

Naloxone (Narcan)
0.1 mg/kg IN

Naloxone (Narcan)
0.1 mg/kg IVP, IN, IM

Beta Blocker

Glucagon
0.025 mg/kg IVP

Organophosphates Carbamates?

Atropine
0.02 mg/kg IVP PRN

Calcium Channel Blocker

Calcium Chloride
20 mg/kg slow IVP

AEMT

Other ingestion/toxin with hypotension/seizures/arrhythmia mental status change

Appropriate protocol

Paramedic

Pearls
Exam: Mental status, skin, HEENT, heart, lungs, abdomen, extremities, neuro
Max dose: Narcan 2 mg, glucagon 1 mg, Calcium Chloride 1 g,Sodium Bicarbonate 50 meq, atropine 2 mg/dose (minimum = 0.1 mg)
- Do not rely on patient history of ingestion in suicide attempt
- Bring bottles to ED
- TCA: seizure, dysrhythmias, hypotension, decreased mental status, coma
- Acetaminophen: normal or N/V - causes irreversible liver failure if not detected
- Depressants: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- Stimulants: increased HR, increased BP, increased temperature, dilated pupils, seizures
- Anticholinergic: increased HR, increased temperature, dilated pupils, mental status change
- Cardiac meds: dysrhythmias, mental status changes
- Insecticides: increased/decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints per restraints procedures
- Mark I kits contain 2 mg Atropine and 600 mg Pralidoxime in autoinjector

Med Control

Pediatric Burns

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- LOC

Signs and Symptoms:
- Burns, pain, swelling
- Dizziness
- LOC
- Hypotension/shock
- Airway compromise/distress
- Singed facial or nasal hair
- Hoarseness or wheezing

Differential:
- Superficial (1st degree)
- red and painful
- Partial thickness (2nd degree)
- blistering
- Full thickness (3rd degree)
- painless/ charred leathery skin
- Chemical
- Thermal
- Electrical
- Radiation

Pediatric Universal Care

Remove rings, bracelets, and other constricting items

Thermal

If burn < 10% BSA (rule of 9's)
Cool down wound with normal saline

Cover with dry sterile sheet or dressings

Pediatric IV Protocol

Pediatric Pain Control Protocol

Morphine 0.1 mg/kg IVP

Maximum dose = 2 mg/dose

or

Fentanyl (Sublimaze)

0.5 - 1 mcg/kg IVP, IN, IO

OR

Ketamine (Ketalar)

0.2 mg/kg SLOW IVP

Consider transport by air ambulance to closest verified burn center for burns >10%
Nearest ED if airway involved.

Chemical

Remove clothing or expose area. Brush off any visible dry chemical or powder

Eye involvement

Saline flush in affected eye

See **Eye Injury/Complaint**

Flush area with water or normal saline For 10 - 15 minutes

Pearls

Exam: Mental status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro

Critical Burns: > 20% BSA age > 10; > 10% BSA age <10; 3rd Degree burns > 10% BSA; 2nd or 3rd degree burns to face, eyes, hands or feet; electrical burns, respiratory burns, deep chemical burns, burns with extremes of age or chronic disease; burns associated with major traumatic injury. These burns require admission or transfer to a burn center

- Early intubation required in significant inhalation injuries
- Treat potential CO exposure with 100% Oxygen
- Circumferential burns to extremities are dangerous due to potential vascular compromise due to soft tissue swelling
- Burn patients are prone to hypothermia
- Do not overlook possibility of multi-system trauma
- Do not overlook possibility of child abuse.

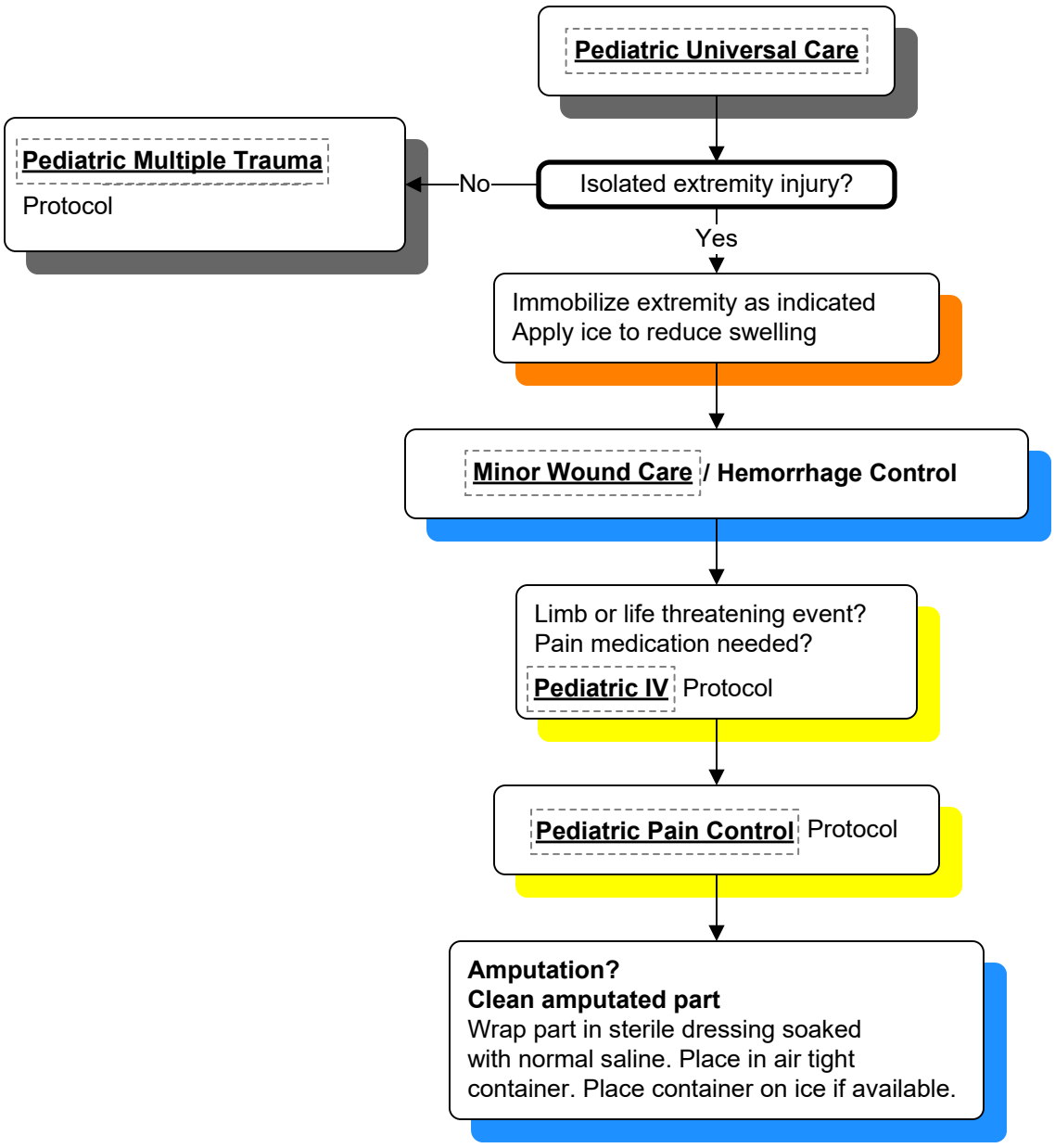
Pediatric Extremity Trauma

Pediatric Trauma

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

Signs and Symptoms:
- Pain
- Swelling
- Deformity
- Altered sensation/motor function
- Diminished pulse/cap refill
- Decreased extremity temperature

Differential:
- Abrasion
- Confusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputations



Pearls
Exam: Mental status, extremity, neuro
- In amputations, time is critical. Consider transport to pediatric trauma center.
- Hip dislocation and knee and elbow fracture/dislocations have a high incidence of vascular compromise
- Urgently transport any injury with vascular compromise
- Blood loss may be concealed or not apparent with extremity injuries
- Severe bleeding not rapidly controlled may necessitate application of a tourniquet
- Lacerations must be evaluated for repair within 6 hours from the time of injury

Pediatric Head Trauma

Pediatric Trauma

History
- Time of injury
- Mechanism: blunt/penetrating
- LOC
- Bleeding
- Medical history
- Medication
- Evidence of multi-trauma
- Helmet use/damage to helmet

Signs and Symptoms:
- Pain
- Swelling
- Bleeding
- Altered mental status
- Unconsciousness
- Respiratory distress/failure
- Vomiting
- Significant MOI

Differential:
- Skull fracture
- Brain injury (concussion, contusion, hemorrhage, laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

General

Remove helmet if indicated

Pediatric Universal Care

Isolated head trauma?

No → **Pediatric Multiple Trauma** Protocol

EMR

Yes

Spinal Motion Restriction Protocol

EMT

Pediatric IV Protocol

The paramedic may intubate non-apneic patients

Obtain **Glasgow Coma Score**

AEMT

GCS < 8 No Gag Reflex → Intubate (apneic) or iGel (preferred) → Maintain $EtCO_2$ 35 mmHg

GCS < 8 Gag Reflex Present → Assist with basic airway maneuvers

GCS > 8

Maintain Pulse Ox > 90%

Paramedic

Consider **Midazolam (Versed)** 0.1 mg/kg IVP for sedation if intubated **Maximum 5 mg**

Seizure?
Go to **Pediatric Seizure** Protocol
Check blood glucose < 60 mg/dl
Dextrose **25%** 1 - 2 ml/kg IVP
Glucagon 0.025 mg/kg IM (EMT Permitted)

Monitor and reassess

Med Control

Pearls
Exam: Mental status, skin, HEENT, heart, lungs, abdomen, extremities, back, neuro
- Consider air transport for GCS < 12; anticipate intubation for GCS < 8

Cushing's Response: Elevated ICP causing hypertension and bradycardia
- Hypotension usually indicates injury or shock unrelated to head injury and should be aggressively treated
- Monitor and document changes in LOC and GCS
- Consider restraints if necessary for safety of patient and/or personnel protection. Do not use Haldol
- Concussions are periods of confusion or LOC associated with trauma and may be resolved upon arrival of EMS
- Any prolonged period of confusion or mental status abnormality that does not return to normal within 15 minutes should be evaluated by a physician

Pediatric Multiple Trauma

Pediatric Trauma

History
- Time and MOI
- Damage to structure/vehicle
- Location in structure/vehicle
- Others injured/dead
- Speed and details of MVC
- Restraints/protective equipment
  - Car seat
  - Helmet
  - Pads
- Ejection
- Past medical history
- Medications

Signs and Symptoms:
- Pain
- Swelling
- Altered mental status
- Unconscious
- Deformity
- Bleeding
- Hypotension/shock
- Arrest

Differential:
- Chest
  - Tension pneumothorax
  - Flail chest
  - Pericardial tamponade
  - Open chest wound
  - Hemothorax
- Intra-abdominal bleeding
- Pelvis/femur fracture
- Spine fracture/cord injury
- Head injury
- Extremity fracture/dislocation
- Airway obstruction
- Hypothermia

Pediatric Universal Care

Rapid trauma assessment and GCS

Consider air ambulance per air transport protocol Minimize on-scene time

Spinal Motion Restriction Protocol

Pediatric IV

Vital signs and perfusion?

Abnormal

Normal Saline bolus to maintain SBP > 90

Continued hypotension
Continue fluid bolus
Consider:
Reduction of long bone fracture
Reduction of pelvic fracture
Control of external hemorrhage

Consider
Needle Chest Decompression

Normal

Ongoing assessment

Transport

Consider
Pediatric Pain Control Protocol

General

EMR

EMT

AEMT

Paramedic

Med Control

Pearls
Exam: Mental status, HEENT, heart, lungs, abdomen, extremities, back, neuro
- Mechanism is the most reliable indicator of serious injury. Examine all restraints/protective equipment for damage
- In prolonged extrications/serious trauma, consider air transport
- Severe bleeding from an extremity not rapidly controlled may necessitate the application of a tourniquet
- Do not overlook the possibility of child abuse

Adenosine (Adenocard)

Pharmacology

Action: Antiarrhythmic

Onset: Half life < 10 sec. Adenosine will not convert atrial fib., atrial flutter, or VT to NSR

Indications

Supraventricular Tachycardia

Pediatric Supraventricular Tachycardia

Adult Dose

6 mg rapid IVP with 10 ml NS flush

Repeat at 12 mg rapid IVP with 10 ml NS flush, if no effect with 6 mg

Pediatric Dose

0.1 mg/kg IVP

0.2 mg/kg IVP and

0.3 mg/kg IVP

Flush each with 5 ml NS

Contra-indications

2nd & 3rd degree AV Block, Sick Sinus Syndrome, Symptomatic bradycardia, unless patient has functioning artificial pacemaker

Adverse Reactions

Cardiovascular: Facial flushing, Headache, Sweating, Palpitations, Chest Pain, Hypotension

Respiratory: Shortness of Breath, Chest Pressure, Hyperventilation, Head Pressure

Central Nervous System: Lightheadedness, Dizziness, Tingling in Arms, Numbness, Apprehension, Blurred Vision, Burning Sensation, Heaviness in Arms, Neck, and Back

Gastrointestinal: Nausea, Metallic Taste, Tightness in Throat, Pressure in Groin.

Precautions

May be rarely associated with ventricular fibrillation. The effects of adenosine are antagonized by methylxanthines such as caffeine and theophylline. In their presence, larger doses may be required or adenosine may not be effective. At the time of conversion to a sinus rhythm, a variety of new rhythms may occur. Generally these last a short period and are normally corrected on their own with no intervention.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Adult dose: Flush with 20 ml NS after each dose **Pediatric dose:** Flush with 5 ml NS after each dose **IV** at antecubital site preferred

Albuterol (Proventil)

Pharmacology

Action: Bronchodilator

EMT can Administer Medication

Onset: improvement within 5 min.
Peak effect 2 hours

Indications

Respiratory Distress
Pediatric Respiratory Distress

Adult Dose

2.5 mg in 3 ml Normal Saline, via nebulized

Pediatric Dose

2.5 mg in 3 ml Normal Saline, via nebulized

Contra-indications

Hypersensitivity, Use caution in patient's with tachydysrhythmias and cardiovascular disorders

Adverse Reactions

Cardiovascular: Tachycardia, Hypertension
Central Nervous System: Tremors, Dizziness, Nervousness, Headache, Insomnia
Ear, Nose, and Throat: Pharyngitis, Nasal Congestion
Gastrointestinal: Nausea, Dyspepsia
Respiratory: Bronchospasm, Cough, Bronchitis, Wheezing

Precautions

Should be used with caution in patients with cardiovascular disoders, especially coronary insufficiency, cardiac arrhythmias and hypertension, in patients with convulsive disorders, hyperthyroidism or diabetes mellitus.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Use of mouth piece is most effective route if patient is cooperative

Amiodarone (Cordarone)

Action: Antiarrhythmic

Onset: Immediate

Indications

Ventricular Tachycardia/Wide Complex w/Pulse | V-Fib/Pulseless V-Tach | Pediatric Pulseless Arrest | Quick Drug Infusion Reference

Adult Dose

V-Tach w/Pulse: 150 mg infusion over 10 minutes
V-Fib / Pulseless V-Tach: 300 mg Rapid IVP, IO
After 3 - 5 minutes, additional 150 mg IVP, IO

Pediatric Dose

5 mg/kg IVP, IO Maximum 300 mg

Contra-indications

∅

Adverse Reactions

Body as a Whole: Fever
Cardiovascular: Hypotension, Asystole/Cardiac Arrest/EMD, Cardiogenic Shock, CHF, Bradycardia, Ventricular Tachycardia, A-V Block
Digestive System: Nausea

Precautions

Like all antiarrhythmic agents, may cause a worsening of existing arrhythmias or precipitate a new arrhythmia. 2% of patients were reported to have respiratory distress syndrome (ARDS). May produce vasodilation and hypotension. **Do not use with irregular Tachyarrhythmias or Torsades.**

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Use large needle when drawing drug into syringe, and draw slowly. This will help prevent foaming.

Aspirin

Pharmacology

Action: Blood modifier
Platelet aggregation

EMT can Administer Medication.

Onset: Peak effect: 15 minutes to 2 hours

Indications

Chest Pain

Adult Dose

325 mg PO

Pediatric Dose

∅

Contra-indications

Ulcers, GI disorders, other bleeding disorders, allergy / hypersensitivity, Renal failure

Adverse Reactions

GI bleeding, nausea, vomiting, bronchospasm

Precautions

Use cautiously in patients with asthma, pregnancy. A one time dose is safe if patient is on coumadin.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Atropine

Pharmacology

Action: Anticholinergic
Increases heart rate

Onset: 2 – 5 minutes, peak effect 15 – 30 minutes.

Indications

Bradycardia | Overdose/Toxic Ingestion | Adult RSI Procedure
Pediatric Bradycardia | Pediatric Overdose/Toxic Exposure

Adult Dose

Bradycardia: 0.5 - 1 mg IVP, IO up to **3 mg Maximum**
Overdose/Toxic Ingestion: 2 mg IVP every 5 minutes No Maximum dose
Adult RSI Procedure: 0.4 mg IVP, IO for excessive salvation due to Ketamine

Pediatric Dose

Pediatric Bradycardia: 0.02 mg/kg IVP, IO
Minimum dose 0.1 mg, **Maximum single dose 1 mg**
Pediatric Overdose/Toxic Exposure: 0.02 mg/kg IVP PRN

Contra-indications

Hypersensitivity, Glaucoma

Adverse Reactions

Cardiovascular: Palpitations, bradycardia (following low doses of atropine) Tachycardia (after higher doses)
CNS: Headache, Flushing, Nervousness, drowsiness, weakness, dizziness, fever, Elderly may exhibit mental confusion or excitement to even small doses, larger doses, Restlessness, Tremor
Gastrointestinal: Nausea, Vomiting, Heartburn

Precautions

May produce drowsiness, dizziness or blurred vision. Use cautiously in patients with asthma or allergies. Use caution in Coronary artery disease, CHF, Cardiac arrhythmias, Tachycardia, Hypertension, Infants, small children, Debiltated patients with chronic lung disease

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Use caution in patients with asthma, allergies CAD, CHF, HTN, infants, small children, & persons with down's syndrome

Calcium Chloride

Action: Hyperkalemia, Calcium channel blocker

Onset: Immediate

Indications

- Pulseless Electrical Activity (PEA)
- Ventricular Tachycardia/Wide Complex w/Pulse
- Pediatric Overdose/Toxic Exposure

Adult Dose

1 gram IVP, IO (Hyperkalemic Arrest)

Pediatric Dose

20 mg/kg Slow IVP **Maximum 1 gram**

Contra-indications

Patients with the risk of existing digitalis toxicity

Adverse Reactions

Rapid injection may cause tingling sensations, a calcium taste, or heat wave. Peripheral vasodilatation, local burning, or moderate fall in BP. If infiltration occurs, IV administration at the site should be discontinued at once.

Precautions

Injections should be made slowly through a small needle into a large vein to minimize venous irritation and avoid undesirable reactions.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Irritating to veins and must not be injected into tissue, severe necrosis and sloughing may occur.

Dextrose

Action: Natural sugar

Dextrose 50%, 25% & 10%

Advanced EMT can Administer Medication

Onset:1 - 2 minutes

Indications

Pulseless Electrical Activity (PEA) | Altered Mental Status | Seizure | Suspected Stroke | Syncope | Pediatric Bradycardia | Pediatric Pulseless Arrest | Pediatric Hypotension/Shock Non-Trauma | Pediatric Newly Born | Pediatric Altered Mental Status | Pediatric Seizure | Pediatric Head Trauma

Adult Dose

Dextrose 50%: 25 g (50 ml) IVP, IO Dextrose 10%: 5 -10 grams IVP, IO

Altered Mental Status, Seizure, Syncope dose: 12.5 g (25 ml)

D10% mixing (no premix available), Remove 50 ml of NS from 250 ml bag
Add 1 amp D50% to bag = D10% Give 50 - 100 ml (5 - 10 grams) IV until return to baseline mentation Recheck blood sugar

Pediatric Dose

(Infant/Child) Dextrose 25%: 1 - 2 ml/kg IVP, IO **Maximum 25 ml**

Newly Born Dextrose 10%: 1 - 2 ml/kg IVP, IO

Contra-indications

Sub Q & IM injections, Intercerebral bleeding, Hemorrhagic CVA, cerebral edema, Delirium Tremors if patient dehydrated

Adverse Reactions

Febrile response, Infection at injection site, Tissue necrosis, Venous thrombosis or phlebitis, Extravasation, Hypovolemia, Dehydration, Mental Confusion or unconsciousness. May produce allergic reactions in corn-sensitive persons. Use the largest available peripheral vein. Rapid infusion may cause a generalized flush.

Precautions

Inject slowly so that extravasation does not occur. If thrombosis occurs, injection should be stopped.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Do not use Dextrose if IV site is questionable. Perform blood glucose analysis prior to administration and 5-15 minutes after initial analysis.

Diltiazem (Cardizem)

Pharmacology

Action: Calcium channel blocker. Decreases heart rate, Slows the ventricular rate in patients with rapid response during atrial fibrillation or atrial flutter.

Onset: Peak effect 2 - 3 hours.

Indications

Atrial Fibrillation **Supraventricular Tachycardia**

Adult Dose

Atrial Fib: 0.25 mg/kg IV over 5 – 10 minutes **Maximum 20 mg**
0.35 mg/kg IV over 5 – 10 minutes **Maximum 20 mg**
SVT: 0.25 mg/kg IV over 5 – 10 minutes **Maximum 20 mg**

Pediatric Dose

∅

Contra-indications

Hypersensitivity, Patients with sick sinus syndrome, 2nd or 3rd degree blocks, except with functioning ventricular pacemaker.
Severe hypotension or cardiogenic shock. WPW, or short PR syndrome. Patient's with wide complex tachycardia, Acute MI, CHF

Adverse Reactions

Hypotension, Itching, or burning at injection site, Vasodilation (flushing), Asystole, A-V Block, Chest Pain, CHF, Syncope, V-Fib., V-Tach., Ectopy, Dizziness, Headache, Nausea, Vomiting, Edema

Precautions

Use with caution in patients with a BP <110; consider ½ dose in these situations. If blood pressure remains adequate greater than 110 and heart rate remains >110, you may administer the other half of the initial loading bolus in 5 minutes.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Do not mix with other drugs. Flush tubing after use. Following injection, response usually occurs within 3 minutes, rarely converting atrial fibrillation or atrial flutter to NSR, but decreases heart rate; lasting 1 to 3 hours.

Diphenhydramine (Benadryl)

Action: Antihistamine

Advanced EMT can Administer Medication

Onset: < 15 min.
Peak effect 1 - 4 hours

Indications

Allergic Reaction

Pediatric Allergic Reaction

Adult Dose

25 - 50 mg IVP, IM

Pediatric Dose

1 mg/kg IVP, IM **Maximum 25 mg**

Contra-indications

Hypersensitivity, Newborns, Lactating females

Adverse Reactions

Cardiovascular: Hypotension, Headache, Palpitations, Tachycardia, extrasystoles
CNS: Sedation, Sleepiness, Dizziness, Fatigue, Confusion, Restlessness, Excitation, Nervousness, Tremor, Irritability, Blurred Vision, Vertigo, Tinnitus, Convulsions
Gastrointestinal: Nausea, Vomiting, Diarrhea
Respiratory: Thickening of Bronchial Secretions, Tightness of Chest and Wheezing, Nasal Stuffiness

Precautions

Has Atropine-like action and should be used with caution in patients with a history of bronchial asthma, increased intraocular pressure, cardiovascular disease or hypertension. Use caution in patients with lower respiratory disease, including asthma. Also pregnant patients. Use caution in elderly patient, may cause dizziness, extreme calm and hypotension.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Should be administered following Epinephrine 1 mg/1 mL in cases involving the respiratory system (stridor, wheezing, retractions).

Dopamine (Intropin)

Action: Increases heart rate & cardiac contractility

Onset: < 5 minutes

Indications

Hypotension/Shock Non-Trauma | **Post Resuscitation**

Adult Dose

Hypotension/Shock, Post Resuscitation, Fever/Sepsis: 5 – 10 mcg/kg/min

Pediatric Dose

∅

Contra-indications

Tachyarrhythmias, Ventricular Fibrillation

Adverse Reactions

Headache, Tachycardia, Nausea and Vomiting, Ectopy, Anginal Pain, Bradycardia, Dyspnea, Anemia, Hypotension, Hypertension, Palpitation, Widened QRS Complex, Anxiety

Precautions

Duration of action is less than 10 minutes, Must be given by IV drip, Use in ventricular arrhythmias that are not corrected, must be done with caution, Decrease pulse pressure, Mix with no other drugs, Dopamine and Lasix = high urine output, Acidosis decreases effectiveness of Dopamine, Must dilute original solution, Phenytoin should not follow Dopamine use, May result in profound hypotension and bradycardia

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Do not mix with other drugs. Must use infusion pump. Acidosis decreases effectiveness. Administer into large vein, infiltration will cause necrosis & sloughing.

DuoNeb (Ipratropium/Albuterol)

Action: Bronchodilator, sympathomimetic/anticholinergic agent

EMT can Administer Medication

Onset: improvement within 5 min. Peak effect 2 hours

Indications

Respiratory Distress

Pediatric Respiratory Distress

Adult Dose

0.5 mg Ipratropium & 2.5 mg Albuterol in 3 ml NS via aerosol

Pediatric Dose

0.5 mg Ipratropium & 2.5 mg Albuterol in 3 ml NS via aerosol

Contra-indications

Hypersensitivity to any of its components, or to atropine and its derivatives.

Adverse Reactions

Respiratory: Bronchitis, Pharyngitis, Pneumonia
Musculo-Skeletal: Leg Cramps
Digestive: Diarrhea, Dyspepsia, Nausea
Urogential: UTI
Whole Body: Pain, Chest Pain

Precautions

DuoNeb should be used with caution in patients with cardiovascular disorders, especially coronary insufficiency, cardiac arrhythmias, and hypertension; in patients with convulsive disorders, hyperthyroidism, or diabetes mellitus.
Due to the presence of ipratropium bromide in DuoNeb, it should be used with caution in patients with narrow-angle glaucoma, prostatic hypertrophy, or bladder-neck obstruction.
Use caution in patients with hepatic or renal insufficiency

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pedi Dose

Medical Considerations

DuoNeb is supplied as a single-dose, ready-to-use vial containing 3 mL of solution. No mixing or dilution is needed.

Epinephrine 1 mg/1 mL

1:1,000

Action: Sympathomimetic & Cardiac stimulant

Onset: 5 - 10 minutes SQ

EMR can Administer by Auto-Injector

EMT can Administer Medication (IM only) for Anaphylaxis

Advanced EMT can Administer Medication (SQ or IM only)

Indications

Allergic Reaction | Respiratory Distress | Pediatric Bradycardia | Pediatric Pulseless Arrest | Pediatric Allergic Reaction | Pediatric Respiratory Distress

Adult Dose

Allergic Reaction: 0.3 mg IM

Respiratory Distress: 0.3 mg SQ, IM

Pediatric Dose

Bradycardia, Pulseless Arrest: 0.1 mg/kg ET may repeat every 3 – 5 minutes **Maximum 1 mg**

Allergic Reaction, Respiratory Distress: 0.01 mg/kg IM **Maximum 0.3 mg**

Respiratory Distress: 0.01 mg/kg SQ, IM **Maximum 0.3 mg**

Nebulized: 0.5 mg/kg **Maximum 5 mg (5 ml)**

Contra-indications

None in Cardiac Arrest, Known Hypersensitivity, Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours.

Adverse Reactions

Palpitations, Arrhythmias, Hypertension, Pulmonary Edema, Dyspnea, Nervousness

Precautions

When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur, Do not mix with any other drugs, Very light sensitive, do not use solutions that are discolored or those that have a precipitate, Massage site after injection to counteract possible vasoconstriction, Use with caution on patients with Epi-Pen usage (previous).

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Always transport after treatment due to rebound effect. Use with caution in males over age 35 or in those patients with a known history of hypertension, thyroid disease or angina.

Epinephrine 1 mg/10 mL

1:10,000

Action: Sympathomimetic & Cardiac stimulant

Onset: < 5 minutes

Indications

Asystole | Pulseless Electrical Activity (PEA) | V-Fib/Pulseless V-Tach
Allergic Reaction | Respiratory Distress
Pediatric Bradycardia | Pediatric Pulseless Arrest | Pediatric Allergic Reaction
Pediatric Respiratory Distress

Adult Dose

Asystole, PEA, V-Fib/Pulseless V-Tach: 1 mg IVP, IO every 3 - 5 minutes
Bradycardia: 0.2 – 0.3 mg IVP, IO
Allergic Reaction 0.3 mg (3 ml) IVP, IO
Respiratory Distress: 0.3 mg / 3 ml NS Nebulized for severe cases 0.3 mg IVP

Pediatric Dose

Bradycardia, Pulseless Arrest:
0.01 mg/kg IVP, IO Repeat every 3 - 5 minutes **Maximum 1 mg (10 ml)**
Allergic Reaction: 0.01 mg/kg IVP PRN **Maximum 0.3 mg (3 ml)**

Contra-indications

None in Cardiac Arrest, Known Hypersensitivity, Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours.

Adverse Reactions

Palpitations, Arrhythmias, Hypertension, Pulmonary Edema, Dyspnea, Nervousness

Precautions

When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur, Do not mix with any other drugs, Very light sensitive, do not use solutions that are discolored or those that have a precipitate, Massage site after injection to counteract possible vasoconstriction, Use with caution on patients with Epi-Pen usage (previous).

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Epinephrine Push Dose

Action: Sympathomimetic & Cardiac stimulant

Onset: Immediate

Indications

Hypotension/Shock Non-Trauma | Post Resuscitation | Fever/Suspected Sepsis | Adult RSI Procedure

Adult Dose

Mix 1 mL Epinephrine
(1 mg/10 mL) with 9 mL Normal Saline and mix syringe
give 1-2 mL (10 - 20 mcg) every 3 minutes until MAP >65

Pediatric Dose

∅

Contra-indications

Known Hypersensitivity, Glaucoma

Adverse Reactions

Anxiety, Headache, Fear, and Palpitations. Repeated injections can result in necrosis at injection sites

Precautions

Quantities in excess of 50 mcg/min can potentially cause end-organ damage

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Remember: push dose is a short term bridge to IV drip and is not intended for prolonged use (notify the receiving facility as soon as possible of the use of push dose epinephrine).

Etomidate (Amidate)

Pharmacology

Action: Hypnotic, Sedative

Onset: 1 minute
Duration: 5 - 7 minutes

Indications

Adult RSI Procedure

Adult Dose

0.3 mg/kg IVP, IO SLOWLY (over 30 - 60 seconds) **Maximum 30 mg**

Pediatric Dose

∅

Contra-indications

Hypersensitivity, Use caution in elderly patients

Adverse Reactions

Averting, Tonic, Clonic movements, Laryngospasm, Apnea, Hyperventilation, Hypoventilation, Hypertension, Hypotension, Tachycardia, Bradycardia Nausea and Vomiting

Precautions

Very Safe in the unstable patient, Onset is predictable and rapid (i.e.: arm to brain), No analgesic side effects, Commonly used in combination with an analgesic, Excellent hemodynamic stability, Reduces intracranial pressure. Side effect of Myocolonus should be anticipated, but will not interfere with intubation efforts

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Fentanyl (Sublimaze)

Action: Narcotic analgesic

Advanced EMT can Administer Medication (Pain control only)

Onset: Almost immediate. Maximal analgesic & respiratory effect may take several minutes.

Indications

Chest Pain | **Pain Control** | **Adult RSI Procedure** | **Head Trauma** | **Pediatric Pain Control**

Adult Dose

Pain: 50 – 100 mcg IVP, IN, IM

Adult RSI Procedure: 2 mcg/kg IVP

Head Trauma: 1 - 3 mcg/kg IVP **Maximum** **3 mcg/kg**

Pediatric Dose

Pain: 0.5 - 1 mcg/kg IVP, IN

Pediatric RSI: 2 mcg/kg IVP **Maximum 1st dose 50 mcg**

Contra-indications

Known intolerance to drug.

Adverse Reactions

Respiratory: Respiratory Depression, Apnea, Laryngospasm
Cardiovascular: Bradycardia, Hypertension, Hypotension
CNS: Dizziness, blurred vision
Gastrointestinal: Nausea & Vomiting
Other: Rigidity, Diaphoresis

Precautions

Use caution in patients with head injuries and elevated ICP. Use caution with bradycardia, COPD and decreased respiratory reserve patients. Also patients using narcotics. Fentanyl should be reduced in elderly and debilated patients. Also, patients with elevated BP with or without pre-existing hypertension. Fentanyl in high doses can result in "stiff chest" with inability to ventilate patient. Stiff chest is treated with IV succinylcholine and intubation.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Use caution when administering Fentanyl to elderly and debilitated patients, or patients with limited pulmonary reserve.

Glucagon

Pharmacology

Action: Anti-hypoglycemic

EMT can Administer Medication

Onset: Patient should respond within 15 minutes

Indications

Pulseless Electrical Activity (PEA) | Altered Mental Status | Seizure | Suspected Stroke | Syncope | Pediatric Bradycardia | Pediatric Hypotension/Shock Non-Trauma | Pediatric Altered Mental Status | Pediatric Seizure | Pediatric Overdose/Toxic Exposure | Pediatric Head Trauma

Adult Dose

1 mg IM, IN

Pediatric Dose

0.025 mg/kg IM **Maximum 1 mg**

Contra-indications

Hypersensitivity, Hyperglycemia, allergies to beef or porcine proteins, Insulinoma, Patients with adrenal gland tumor

Adverse Reactions

Nausea, Vomiting

Precautions

Glucagon is of little help in patients with adrenal insufficiency. Administration of Glucagon should be followed by supplemental carbohydrates.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Do not mix with saline

Ipratropium (Atrovent)

Pharmacology

Action: Bronchodilator

EMT can Administer Medication

Onset: Peak effect: 1.5 - 2 hours

Indications

Respiratory Distress

Pediatric Respiratory Distress

Adult Dose

0.5 mg (500 mcg) nebulized

Pediatric Dose

0.5 mg (500 mcg) nebulized

Contra-indications

Allergy to soy or peanut products, Glaucoma,
Suspected hypersensitivity to Ipratropium Bromide or to Atropine and/or its derivatives,
Caution in OB patients

Adverse Reactions

Dry mouth, Headache, Cough, Nausea, Vomiting, Dizziness, Nervousness, Palpitations, Glaucoma patients may experience pain or blurred vision if contact with eyes

Precautions

May cause bronchoconstriction to worsen. This is thought to be related to the hypotonicity of the solution or to additives, such as benzalkonium chloride. It is for this reason that beta-adrenergic agonists should be given first or in combination with ipratropium bromide. Use caution in patients with narrow angle glaucoma, prostatic

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Ketamine (Ketalar)

Pharmacology

Action: Non-barbiturate anesthetic

Advanced EMT can Administer Medication

Onset: IV 30 seconds – 2 minutes
IM 3 – 4 minutes

$EtCO_2$ monitoring is required when using this medication

Indications

Atrial Fibrillation | Bradycardia | Ventricular Tachycardia/Wide Complex w/Pulse | Pain Control | Behavioral Emergency | Pulmonary Edema | Pediatric Pain Control | Adult RSI Procedure

Adult Dose

Atrial Fibrillation 0.2 mg/kg IVP, IN, IM

Bradycardia / V-Tach/Wide Complex w/Pulse / Pain Control / Pulmonary Edema : 0.2 mg/kg IVP, IN, IM

Supraventricular Tachycardia: 0.2 mg/kg IVP

Behavioral Emergency: 4 mg/kg IM or IN

Adult Airway / Head Trauma: 1 – 2 mg/kg/hr

Adult RSI Procedure: Induction Normotensive 2 mg/kg **Maximum 200 mg**
Hypotensive 0.5 mg/kg **Maximum 50 mg**
Post Intubation: Infusion 1 - 2 mg/kg/hr

Pediatric Dose

Pediatric Pain Control: 0.2 mg/kg IVP, IN, IM

Pediatric RSI Procedure: Induction Normotensive 2 mg/kg Hypotensive 0.5 mg/kg
Post Intubation: Infusion 1 mg/kg/hr

Pediatric Burns: 0.2 mg/kg Slow IVP

Contraindications

Those whom a significant elevation of blood pressure would constitute a serious hazard and in those who have shown hypersensitivity to the drug.

Adverse Reactions

Cardiovascular: BP and pulse rate are frequently elevated following administration. Hypotension and bradycardia have been observed. Arrhythmia has also occurred
Gastrointestinal: Nausea / vomiting; increased salivation
Neurological: Enhanced skeletal muscle tone may be manifested by tonic and clonic movements sometimes resembling seizures.
Respiratory: Although respiration is frequently stimulated, severe depression of the respiration or apnea may occur following rapid IV administration of high doses. Laryngospasms and other forms of airway obstruction have occurred.

Precautions

Resuscitative equipment should be ready for use. IV dose should be administered over 1 minute. More rapid administration may result in respiratory depression or apnea and enhanced pressor response. Use caution in the chronic alcoholic and the acutely alcohol-intoxicated patient.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Monitor vital signs frequently. Use caution with elderly and pediatric patients and use low end of dosing range.

Labetalol (Trandate)

Pharmacology

Action
Antihypertensive

Onset: 30 - 90 seconds

Indications

Hypertension

Adult Dose

20 mg IVP

Pediatric Dose

∅

Contraindications

Bronchial asthma, overt cardiac failure, greater than first degree block, cardiogenic shock, severe bradycardia, other conditions associated with severe and prolonged hypotension, and in patients with a history of hypersensitivity. Beta-blockers, even those with apparent cardioselectivity, should not be used in patients with a history of obstructive airway disease, including asthma.

Adverse Reactions

Cardiovascular: Ventricular arrhythmia
CNS & Peripheral System: Dizziness, tingling of the scalp/skin, hypoesthesia (numbness) and vertigo
Gastrointestinal: Nausea, vomiting, dyspepsia (epigastric discomfort)
Metabolic Disorders: Transient increases in blood urea nitrogen and serum creatinine levels occurred, associated with drops in BP, generally in patients with prior renal insufficiency
Psychiatric: Somnolence/yawning
Respiratory: Wheezing

Precautions

Impaired hepatic function may diminish metabolism of labetalol. Following coronary artery bypass surgery in one uncontrolled study, patients with low cardiac indices and elevated systemic vascular resistance following IV injection experienced significant declines in cardiac output with little change in systemic vascular resistance. High dose labetalol, several patients experienced hypotension and bradycardia.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Lidocaine (Xylocaine)

Pharmacology

Action: Anti-arrhythmic

Advanced EMT can Administer Medication (for pain relief after IO needle insertion)

Onset: 30 - 90 seconds

Indications

V-Fib/Pulseless V-Tach | Ventricular Tachycardia/Wide Complex w/Pulse | Pediatric Pulseless Arrest | Vascular Access-Intraosseous | Adult IV/IO

Adult Dose

Ventricular Tachycardia/Wide Complex w/Pulse, V-Fib/Pulseless V-Tach:

1st Dose 1 - 1.5 mg/kg IVP, IO

2nd Dose 0.5 - 0.75 mg/kg IVP, IO **Maximum** 3 mg/kg

Intraosseous (Pain Management): 40 mg IO Slowly, Flush IO catheter with NS 5 – 10 mL

Pediatric Dose

Pediatric Pulseless Arrest: 1 mg/kg IVP, IO

Intraosseous (Pain Management): 0.5 mg/kg Slowly **Maximum 40 mg**

Flush IO catheter with NS 2 – 5 mL

Contra-indications

Bradycardia, 2nd or 3rd degree heart block, Known hypersensitivity, Stokes-Adams syndrome, WPW

Adverse Reactions

Drowsiness, Vomiting, Confusion, Seizures, Hypotension, Bradycardia, Slurred speech, Tremors, Restlessness, euphoria, Hypotension, Tinnitus, Blurred, or double vision

Precautions

Contraindicated if allergic to other amide type anesthetics such as Nupercaine. Caution in patients with greater than second degree heart block. DC drug if signs of toxicity appear (i.e.: dizziness, convulsions or confusion. Convulsions may be the first sign of toxicity). Use in caution in patients with digitalis toxicity.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Observe closely for drug toxicity Signs include: dizziness, confusion, delirium, seizures

Magnesium Sulfate

Pharmacology

Action: Magnesium is physiological calcium channel blocker and blocks neuromuscular transmission

Onset: immediate
Lasts about 30 minutes

Indications

V-Fib/Pulseless V-Tach | **Obstetrical Emergency** | **Respiratory Distress**

Adult Dose

V-Fib/Pulseless V-Tach: 2 g IVP
Obstetrical Emergency: 4 g IVP Slow over 10 - 20 minutes
Respiratory Distress: 2 g IVP over 20 minutes

Pediatric Dose

∅

Contra-indications

Heart block or myocardial damage, Hypertension, Caution with renal impairment.
Caution: Reduce dosing with concurrent narcotics and/or hypnotics

Adverse Reactions

Respiratory depression, Hypothermia,
Circulatory collapse, Respiratory paralysis, Hypotension, Diaphoresis, Facial flushing, Sweating, Depressed reflexes

Precautions

Use caution on renal impairment patients because drug is solely removed by the kidneys. Clinical indications of a safe dosage regimen include the presence of the patellar reflex (knee jerk) and absence of respiratory depression. When barbiturates, narcotics, or other hypnotics are given in conjunction with Magnesium, their dosage should be adjusted because of the additive central depressive effects. Use caution in patients receiving digitalis.
Stop infusion if hypotension develops, difficulty breathing, decreased deep tendon reflexes or paralysis.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Not compatible with Sodium Bicarbonate

Methylprednisolone (Solu-Medrol)

Action: Anti-inflammatory steroid

Onset: 1 – 2 hours

Indications

Allergic Reaction | Respiratory Distress
Pediatric Allergic Reaction | Pediatric Respiratory Distress

Adult Dose

125 mg slow IVP, IM

Pediatric Dose

Allergic Reaction: 1 mg/kg IVP, IM Maximum 125 mg
Respiratory Distress: 1 - 2 mg/kg IVP

Contra-indications

There are no contraindications, precautions or side effects associated with a single dose used in emergencies.

Adverse Reactions

Fluid & Electrolyte Disturbances: CHF in susceptible patients, HTN
Musculoskeletal: Weakness
Neurological: Convulsions, headache, vertigo
Metabolic: Nausea & vomiting
Cardiovascular: Arrhythmias, hypotension **Skin**: Sweating

Precautions

Nonspecific ulcerative colitis, impending perforation or abscess or other infection. Peptic ulcer, renal insufficiency, hypertension, osteoporosis, myasthenia gravis (weakness of muscles)

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Midazolam (Versed)

Pharmacology

Action: Sedative, Amnesic, Short acting benzodiazepine CNS depressant

Advanced EMT can Administer Medication

Onset: 2 - 5 minutes

Indications

Atrial Fibrillation | Bradycardia | Supraventricular Tachycardia | Ventricular Tachycardia/Wide Complex w/Pulse | Bites and Envenomation's | Hyperthermia | Behavioral Emergency | Seizure | Obstetrical Emergency | Adult Airway | Pulmonary Edema | Head Trauma | Adult RSI Procedure | Pediatric Supraventricular Tachycardia | Pediatric Seizure | Pediatric Head Trauma

Adult Dose

Atrial Fibrillation: 2 – 5 mg IVP
Bradycardia: 2 mg IVP, IO
Supraventricular Tachycardia: 2 – 5 mg
Ventricular Tachycardia/Wide Complex w/Pulse: 2.5 – 5 mg IVP, IM, IN
Bites and Envenomation's: 2 – 5 mg IVP Maximum 5 mg
Hyperthermia: 2 mg IVP, 5 mg IM or, 5 mg IN
Behavioral Emergency: 2 – 5 mg IVP, IM, IN
Seizure: 2 – 5 mg Slow IVP, or 5 mg IM, IN May be repeated x 1
Obstetrical Emergency: 2 – 5 mg Slow IVP
Adult Airway: 2 – 5 mg IVP, IO
Pulmonary Edema: 1 – 2 mg IVP, or 2 mg IN
Head Trauma: 2 – 5 mg IVP Adult RSI Procedure: 0.05 mg/kg IVP

Pediatric Dose

SVT: 0.1 mg/kg IVP, IN **Maximum 2 mg**
Pediatric Seizure: 0.05 - 0.1 mg/kg IVP **Maximum 5 mg** if no IV 0.2 mg/kg IM, IN
Pediatric Head Trauma: 0.1 mg/kg IVP **Maximum 5 mg**

Contra-indications

Hypersensitivity, Pregnant, Nursing mothers, Renal failure, Shock, Glaucoma, Acute alcoholic intoxication with depressed vital signs

Adverse Reactions

Apnea, Respiratory depression, Hypoxia, Decreased tidal volume, Fluctuations in vital signs, Dysrhythmias, Hypotension if pushed to fast, Euphoria, Confusion, Nausea, Vomiting, Headache, Hiccups

Precautions

Not recommended in pregnancy; refer to Magnesium Sulfate for Eclampsia.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Consider reducing the dose on elderly & debilitated patients. These patients may take longer to recover from drug. **Monitor Respiratory status.**

Morphine

Action: Narcotic (Opiate) agonist

Advanced EMT can Administer Medication

Onset: 2 - 3 minutes

Indications

Pain Control

Pediatric Pain Control **Pediatric Burns**

Adult Dose

Chest Pain: 2 – 4 mg Slow IVP **Maximum 10 mg**

Pain Control: 2 – 5 mg IVP, IM

Pulmonary Edema: 2 mg Slow IVP

Pediatric Dose

Pain Control: 0.1 mg/kg IVP, IM May repeat in 10 minutes x 1

Burns: 0.1 mg/kg IVP Maximum 2 mg/dose

Contra-indications

Hypersensitivity, Significant hypotension, Acute abdominal conditions, Multisystem trauma, Head injury, Convulsive disorders, Hypovolemia, Asthma, Pregnancy

Adverse Reactions

Major hazards are Respiratory Depression and lesser degree circulatory depression. Respiratory Arrest, Shock and Cardiac Arrest have occurred, particularly with overdose or rapid IV administration.

Cardiovascular: Tachycardia, Bradycardia, Palpitation, Faintness, Syncope, and Orthostatic Hypotension

CNS: Euphoria, Dysphasia, Weakness, Headache, Agitation, Tremor, Uncoordinated muscle movements, Hallucinations and Disorientation, visual Disturbances

Allergic: Reactions to Opiates, Urticaria, Anaphylactic Reactions

Other: Face Sweating, Local Tissue Irritation and pain

Precautions

Systolic BP at least 90 mmHg (may need to manage with fluid bolus).
Watch for respiratory depression and be prepared to support ventilations. Narcan® should be readily available when administering Morphine.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Administer slowly to avoid nausea & vomiting.
Antidote: Administer Narcan 2 mg IVP, to reverse effects of morphine if necessary.
Use with caution with the elderly.

Nalbuphine (Nubain)

Action: Narcotic analgesic

Advanced EMT can Administer Medication

Onset: IV 2 – 3 minutes
IM < 15 minutes

Indications

Pain Control

Adult Dose

5 mg IVP, 10 mg IM

Pediatric Dose

∅

Contra-indications

Hypersensitivity, patients physically dependent to opioids and who have not been detoxified

Adverse Reactions

Respiratory: Respiratory Depression, Apnea, Laryngospasm
Cardiovascular: Bradycardia, Hypertension, Hypotension
CNS: Dizziness, blurred vision, headache, sedation
Gastrointestinal: Nausea & Vomiting, dry mouth
Skin: Sweating
Other: Rigidity, Diaphoresis

Precautions

Head trauma, increased ICP, severe renal, hepatic, or pulmonary disease, hypothyroidism, adrenal insufficiency, alcoholism, undiagnosed abdominal pain.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

May be reversed with Narcan

Naloxone (Narcan)

Pharmacology

Action: Narcotic antagonist Reverses the effects of opiates including respiratory depression.

Advanced EMT can Administer Medication

EMT can administer medication-Intranasal (IN & Auto-Injector only)

EMR can Administer Medication (IN & Auto-Injector only)

Onset: 2 minutes.

Indications

Pulseless Electrical Activity (PEA) | Altered Mental Status | Overdose/Toxic Ingestion | Pediatric Bradycardia | Pediatric Pulseless Arrest | Pediatric Newly Born | Pediatric Altered Mental Status | Pediatric Overdose/Toxic Exposure

Adult Dose

PEA: 2 - 4 mg IVP, IO, IN, IM (if early arrest)

Altered Mental Status: 2 mg IVP, IN, IM

Overdose/Toxic Ingestion: 0.4 - 2 mg IVP, IN May repeat until breathing normally

Pediatric Dose

Bradycardia: 0.2 mg/kg IVP, IO, IN, IM **Maximum 2 mg**

Pediatric Pulseless Arrest: 0.1 mg/kg IVP, IO, ETT

Newly Born: 0.1 mg/kg IVP, IO

Altered Mental Status: 0.1 mg/kg IVP, IN, IM

Overdose/Toxic Exposure: 0.1 mg/kg IVP, IN, IM

Contra-indications

Known Hypersensitivity

Adverse Reactions

Increased BP, Tachycardia, Projectile vomiting, Tremors, Seizures (possibly an opiate addiction withdrawal symptom), Dysrhythmias, Cardiac arrest

Precautions

Nausea, Vomiting, Sweating, Tachycardia, Increased Blood Pressure, Tremulousness, Seizures, and Cardiac Arrest

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Short half life. Effects last 1-4 hours, patients should be watched closely. Narcotic effect will often outlast the antagonist actions. Subsequent IM dose will prolong IV effects.

Nitroglycerin

Action: Antianginal agent (coronary vasodilator)

Advanced EMT can Administer Medication (SL only)

EMT can Assist if patient prescribed medication.

Onset: 2 minutes

Indications

Chest Pain | **Hypertension** | **Pulmonary Edema**

Adult Dose

Chest Pain: 0.4 mg SL every 5 minutes is SBP > 90 mmHg

Hypertension: spray SL every 5 minutes until mean arterial pressure (MAP) is 110 mmHg

Pulmonary Edema: 0.4 mg SL every 2 – 3 minutes if systolic BP > 110 mmHg

Pediatric Dose

∅

Contraindications

Known Hypersensitivity,
Pericardial tamponade, Restrictive Cardiomyopathy, Constrictive pericarditis Do not administer Nitroglycerin if the following medications were taken, until after hours stated:

Drug	Hours
Cialis	48
Levitra	24
Viagra	24+

Adverse Reactions

Headache, Orthostatic hypotension, Dizziness, Weakness, Palpitations, Nausea & vomiting

Precautions

Contraindicated in head trauma.
Use caution in any patient whom is intoxicated.
Be sure to remove any transdermal system before defibrillation.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Check for transdermal patch prior to initiating spray/tablet.

Norepinephrine (Levophed)

Pharmacologic Action - Strong beta-1 and alpha-adrenergic effects and moderate beta-2 effects, which increase cardiac output and heart rate, decrease renal perfusion and peripheral vascular resistance, and cause variable BP effects

Class – Alpha/beta adrenergic agonist

Indications

Hypotension/Shock Non-Trauma | **Post Resuscitation** | **Fever/Suspected Sepsis**

Adult Dose

0.1 – 0.5 mcg/kg/min IV

Pediatric Dose

∅

Contraindications

Hypersensitivity, hypotension due to blood volume deficit, peripheral vascular thrombosis (except for lifesaving procedures)
RELATIVE CONTRAINDICATIONS: concomitant use with some general anesthetics: chloroform, trichloroethylene, cyclopropane, halothane

WARNING: Norepinephrine is a vesicant and can cause severe tissue damage if extravasation occurs. Do not use in the same IV line as alkaline solutions as these may deactivate it

Adverse Reactions

Cardiovascular: Hypertension, ventricular arrhythmia, bradycardia
Neurological: Headache
Dermal: Necrosis if the drug extravasates

Precautions

Norepinephrine (Levophed) causes tissue necrosis if infused into the interstitial space. Use large veins and verify IV patency prior to administration of **Norepinephrine (Levophed)**.
Do not interrupt the infusion of **Norepinephrine (Levophed)** to ensure a consistent therapeutic blood level, establish an additional venous access site for the administration of fluids or additional medications.
Norepinephrine (Levophed) is inactivated by **Sodium Bicarbonate**. Do not administer **Sodium Bicarbonate** in the same IV line with **Norepinephrine (Levophed)**.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Prefer Central line administration but may temporarily give through large bore IV that flushes well. Monitor closely for extravasation.

Normal Saline 0.9 (NS)

Action: Nonpyrogenic solution for fluid and electrolyte replacement

Advanced EMT can Administer Medication

Indications

Used throughout protocol

Adult Dose

KVO
Fluid Bolus

Pediatric Dose

KVO
Fluid Bolus

Contra-indications

None known

Adverse Reactions

Reactions which may occur because of the solution or the technique of administration include febrile response, infection at the site of injection, venous thrombosis or phlebitis extending from the site of injection, extravasation, and hypervolemia. If adverse reaction does occur, discontinue infusion.

Precautions

Geriatric use: In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or drug therapy.
Do not administer unless solution is clear and seal is intact.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Ondansetron (Zofran)

Pharmacology

Action: Antiemetic

Advanced EMT can Administer Medication ODT

Onset: Rapid
Peak effect:15 – 30 minutes

Indications

Chest Pain | Abdominal Pain | Vomiting/Diarrhea | Eye Injury/Complaint | Pediatric Vomiting/Diarrhea

Adult Dose

Chest Pain: 4 mg IVP, IM, ODT

Abdominal Pain, Vomiting/Diarrhea, Eye Injury/Complaint: 4 mg IVP, IM, ODT

Pediatric Dose

0.2 mg/kg IVP, ODT **Maximum 4 mg**

Contra-indications

Hypersensitivity

Adverse Reactions

Cardiovascular: Angina, Electrocardiographic Alterations, Hypotension, Tachycardia, Syncope, Palpitations
Neurological: Extrapyramidal reactions, Grand Mal Seizure, Dizziness, Lightheadness,
General: Flushing
Local Reactions: Pain, Redness, Burning at site of injection
Other: Hypokalemia, Hiccups

Precautions

Not a drug that stimulates gastric or intestinal peristalsis. Transient ECG changes including, QT interval prolongation.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Do not use in 1st TM pregnancy

Oral Glucose

Pharmacology

Action: Natural sugar

EMT can Administer Medication.

Onset: 1 - 2 minutes

Indications

Altered Mental Status

Adult Dose

15 grams

Pediatric Dose

∅

Contra-indications

Do not administer to unconscious person or unable to swallow

Adverse Reactions

∅

Precautions

∅

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Oxygen

Action: Medical gas

EMR can Administer Medication.

Indications

Throughout protocol

Adult Dose

2 - 6 LPM via nasal cannula
10 - 15 LPM via non-rebreather mask
10 - 15 LPM or greater via BVM / ET

Pediatric Dose

2 - 6 LPM via nasal cannula
10 - 15 LPM via non-rebreather mask
10 - 15 LPM or greater via BVM / ET

Contraindications

None
May depress respirations in rare patients with chronic obstructive pulmonary disease. This is not a contraindication to its use, but simply means that such patients must be watched closely and assisted to breathe if the respiratory rate declines.

Adverse Reactions

Toxicity, depressed hypercarbonic drive (Respiratory depression with COPD patients)

Precautions

∅

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Rocuronium (Zemuron)

Pharmacology

Action
Neuromuscular blocking agent

PARALYZING AGENT

Onset:
Less than 2 minutes
Half Life: 1 – 2 minutes

Indications

Adult RSI Procedure

Non-depolarizing neuromuscular blocking agent used to facilitate tracheal intubation during RSI

Adult Dose

RSI: Normotensive: 1.2 mg/kg IVP Hypotensive: 1.6 mg/kg IVP
Post Intubation: 0.6 - 1.2 mg/kg IVP

Pediatric Dose

∅

Contra-indications

Hypersensitivity

Adverse Reactions

Cardiovascular: arrhythmia, abnormal electrocardiogram, tachycardia
Digestive: nausea, vomiting
Respiratory: asthma (bronchospasm, wheezing, or rhonchi), hiccup
Skin and Appendages: rash, injection site edema, pruritus

Precautions

Severe anaphylaxis has been reported. Consider cross-reactivity among neuromuscular blocking agents.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Avoid use of long acting neuromuscular blockers like rocuronium in neuorlogic emergencies if possible

Sodium Bicarbonate

Action: Alkalinizing agent, Antacid, Electrolyte

Sodium Bicarbonate: No longer used routinely for Cardiac Arrest. See **Special Considerations** below.

Onset: Immediate

Indications

Pulseless Electrical Activity (PEA) | Overdose/Toxic Ingestion
Pediatric Pulseless Arrest | Pediatric Overdose/Toxic Exposure

Adult Dose

PEA: 1 mEq/kg IVP, IO (Hyperkalemia, Tricyclic Overdose)
Overdose/Toxic Exposure: 1 mEq/kg IVP

Pediatric Dose

Pediatric Pulseless Arrest: 1 mEq/kg IVP, IO **Maximum 50 mEq**
Pediatric Overdose/Toxic Exposure: 1 mEq/kg IVP, IO **Maximum 50 mEq**

Contra-indications

Hypertension, Convulsions, CHF, and other situations where administration of sodium can be dangerous

Adverse Reactions

Hypernatremia, alkalosis, hypokalemia

Precautions

Over dosage and alkalosis should be avoided, may cause vascular irritation or sloughing if given extravascularly, Avoid scalp vein use. Risks of over dosage and alkalosis should be avoided. Use caution in patient with CHF or other edematous or sodium-retaining states

Special Considerations

- Maternal arrest: treat mother per appropriate protocol with immediate notification to medical control and rapid transport preferably to post cardiac arrest center that has OB capabilities. Place Mother supine and perform left uterine displacement moving uterus to the patient's left side. IV access preferably above diaphragm. Defibrillation safe at all energy levels.
- renal dialysis/renal failure. Utilize calcium chloride 1 g and sodium bicarbonate 50 mill equivalent for suspected hyperkalemic arrest.
- Bicarbonate . No longer recommended for routine cardiac arrest management. Consider in suspected hyperkalemia or tricyclic overdose with 50 mill equivalence IV/IO
- opioid overdose. If early arrest, naloxone 2 mg IV/IO/IM/IN
- Drowning, suffocation, asphyxiation, hanging, lightning strike. Hypoxic associated cardiac arrest with prompt attention to airway ventilation as a priority followed by high-quality continues chest compressions and early fibrillation.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Flush IV tubing before and after administration. If potassium falls too low, the heart may become irritable, especially if the patient is taking a digitalis preparation.

Succinylcholine (Anectine)

Pharmacology

Action: Depolarizing skeletal muscle relaxant. Neuromuscular blocker.

PARALYZING AGENT

Onset: 0.5 - 1 minute

Indications

Adult RSI Procedure

Non-depolarizing neuromuscular blocking agent used to facilitate tracheal intubation during RSI

Adult Dose

1.5 - 2 mg/kg IVP, IO

Pediatric Dose

∅

Contraindications

Family hx.Of malignant hyperthermia, Skeletal muscle myopathies, Hypersensitivity, After acute phase of: Major burns, multiple trauma, major crush injury, or abdominal sepsis (over 24 hours) and denervating conditions (CVA, Parkinson's disease, ALS, spinal cord injury), Succinylcholine administered to such individuals may result in severe hyperkalemia which may result in cardiac arrest.

Adverse Reactions

Profound muscle relaxation, respiratory depression & apnea-profound, causes hyperkalemia, cardiac arrest, malignant hyperthermia, arrhythmias, bradycardia, tachycardia, hypertension, hypotension, increased intraocular pressure, muscle fasciclations, jaw rigidity, excessive salivation, and rash

Precautions

Patients with fractures or muscle spasm because of muscle fasciculations, may cause additional trauma. May cause a transient increase in intracranial pressure. May cause intragastric pressure, which could result in regurgitation and possible aspiration. Neuromuscular blockade may be prolonged in patients with hypokalemia or hypocalcemia. **Use caution in patients with: Penetrating eye injury & closed head injuries, Glaucoma**

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Causes visible fasciculation's, or disorganized muscle contractions.

Tetracaine

Pharmacology

Action: Ophthalmic anesthetic

Indications

Eye Injury/Complaint

Adult Dose

2 drops in affected eye

Pediatric Dose

∅

Contra-indications

Penetrating injury to eye or extrusion of scleral contents

Adverse Reactions

CNS: Dizziness, Drowsiness, sweating, muscle twitching, trembling
Cardiovascular: irregular heart rate
Respiratory: Shortness of breath
Gastrointestinal: Nausea & Vomiting
General: Unusual excitement, Nervousness, Restlessness
Less common occurrences: Burning, Stinging, Redness
Rare occurrences: Itching, Pain, Swelling of eye or eyelid, watering of eyes

Precautions

Do not rub or wipe eye until anesthetic has worn off and feeling in eye returns. To do so may cause injury or damage to the eye.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

None

Thiamine

Pharmacology

Action:
Vitamin B1, a cofactor needed for the utilization of glucose.

Onset: hours

Indications

Altered Mental Status | Seizure | Suspected Stroke | Syncope

Adult Dose

100 mg IVP

Pediatric Dose

∅

Contra-indications

Known hypersensitivity

Adverse Reactions

Anaphylaxis, Hypotension

Precautions

Should be given prior to the administration of D50 because administration of glucose may precipitate acute symptoms of thiamine deficiency in marginally nourished subjects

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Tranexamic Acid-TXA (Cyklocapron)

Action: Antifibrinolytic hemostatic

Advanced EMT can Administer Medication

Onset: 3 hour half life.

Indications

Multiple Trauma

Age >16, Uncontrolled Hemorrhage, SBP <90; HR >110, Time from injury <3 hours

Adult Dose

1 gram/50 ml NS IV over 10 minutes

Pediatric Dose

∅

Contra-indications

More than 3 hours since injury. On anticoagulants.
Do not give to known pregnancy.

Adverse Reactions

HTN, increased ICP.

Precautions

Monitor for symptoms of severe allergic reaction and changes in vision

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Transport to Designated Trauma Center

Vecuronium (Norcuron)

Action: Paralytic Non-depolarizing neuromuscular blocking agent

PARALYZING AGENT

Onset: < 1 minute

Indications

Drug Shortage Procedure

Adult Dose

0.1 mg/kg IVP

Pediatric Dose

Contra-indications

Hypersensitivity / Allergy

Adverse Reactions

Most frequent reaction is an extension of the drug's pharmacological action beyond the time period needed. May vary from skeletal muscle weakness to profound and prolonged skeletal muscle paralysis resulting in respiration insufficiency or apnea.

Precautions

Slower circulation time in cardiovascular disease, old age, edematous states resulting in increased volume of distribution may contribute to a delay in onset time. Severe obesity or neuromuscular disease may pose airway and/or ventilatory problems. Malignant hyperthermia. Vecuronium has no known effect on consciousness, the pain threshold, or cerebration. Administration must be accompanied by adequate anesthesia or sedation.

Storage: Protect from light.

Contraindications
Indications
Adverse Reactions
Adult Dose
Precautions
Pediatric Dose

Medical Considerations

Keep patient sedated with Versed when using Vecuronium. Monitor vital signs every 5 minutes. Patient must be monitored with capnography while paralyzed.

Quick Drug Infusion Reference

DRUG	CONCENTRATION	TYPICAL DOSING
AMIODARONE	150 mg or 300 mg in 100 ml normal saline or D5W (remember filter)	1 mg/min
CEFTRIAXONE	1 gram in 50 or 100 ml of NS or D5W	Infuse over 30 min
DILTIAZEM	100 mg/100 ml NS = 1 mg/ml	10 – 15 mg/hour
DOBUTAMINE	1 gram/250 ml NS = 4 mg/ml	2 – 20 mcg/kg/min
DOPAMINE	400 mg/250 ml NS = 1.6 mg/ml	2 – 20 mcg/kg/min
EPINEPHRINE	4 mg/250 ml NS = 16 mcg/ml	1 - 4 mcg/min
HEPARIN	25,000 units/500 ml NS = 50 units/ml	see protocol
LIDOCAINE	2 grams/250 ml NS = 8 mg/ml	1 – 4 mg/minute
NICARDIPINE	25 mg/50 ml NS = 0.5 mg/ml 5mg/hour to	15 mg/hour
NITROGLYCERINE	50 mg/250 ml NS = 200 mcg/ml	5 – 200 mcg/min
NOREPINEPHRINE	8 mg/250 ml NS = 32 mcg/ml	0.02 - 0.5 mcg/kg/min
PHENYTOIN	1 gram in 100 ml NS (remember filter)	Not faster than 50 mg/min
PROCAINAMIDE	2 grams/250 ml NS = 8mg/ml	17 mg/kg bolus at 20 mg/min to 1 gram then 1 – 4 mg/min

Lima Memorial Health System EMS Protocol
Standard Drug Formulary List

Brand Name	Trade Name	Strength	Dose Form	Supplied
Adenocard	Adenosine	3mg/ml	Injection	Vial
Anectine	Succinylcholine	20mg/ml - 10ml	Injection	Vial
Aspirin,Children's	Aspirin, Low Dose	81 mg	Tablet	Chewable
Atropine Sulfate	Atropine Sulfate	0.1mg/ml - 10ml	Injection	Syringe
Atrovent	Ipratroprium bromide	0.5mg/2.5 ml UD	Inhalation	U/D amp
Benadryl	Diphenhydramine	50mg/ml	Injection	Vial
Calcium Chloride	Calcium Chloride	100mg/ml	Injection	Syringe
Cardizem	Diltiazem HCL	5mg/ml	Injection	Vial
Cordarone	Amiodarone HCL	150mg/3ml	Injection	Vial
Cyklocapron	Tranexamic Acid	150mg/ml	Injection	Syringe
Dextrose 10%	Destrose 10%	250 ml	Injection	Bag
Dextrose 25% "Infant"	Dextrose 25%	2.5GM/10ml	Injection	Syringe
Dextrose 5% Water	D5W	1000ml	Injection	Bag
Dextrose 50%	Dextrose 50%	25GM/50ml	Injection	Syringe
Duo Neb	Albuterol/Atrovent	3ml	Aerosol	Vial
Epinephrine	Epinephrine	1mg/ml	Injection	30ml Vial
Epinephrine	Epinephrine	0.1mg/ml - 10ml	Injection	Syringe
Epinephrine	Epinephrine 1:1000	1mg/ml 1ml	Injection	Amp
EpiPen Auto Injector	Epinephrine	0.3mg/0.3ml	Injection	Syringe
EpiPen Jr. Auto Injector	Epinephrine	0.15mg/0.3ml	Injection	Syringe
Etomidate	Amidate	10ml	injection	Vial
Fentanyl Citrate	Fentanyl Citrate	50mcg/ml - 2ml	Injection	Amp
Glucagon	Glucagon	1mg/ml	Injection	Vial
Glutose 15	Glucose Oral Gel	15gm/dose	Oral Gel	Tube
Haloperidol	Haldol	10mg/ml	Injection	Vial
Intropin	Dopamine	400 mg in D5W-250 ml	Injection	Pre Mix
Ketamine	Ketalar	500 mg/10ml	Injection	Vial
Labetalol	Trandate	20mg/4ml	Injection	Syringe
Lactated Ringers	LR	500 or 1000 ml	Injection	Bag
Levophed	*Norepinephrine*	4mg ampule	Injection	Amp
Lidocaine HCL	Lidocaine HCL	2% - 20ML MDV	Injection	Vial
Lidocaine HCL	Lidocaine HCL	20mg/ml - 5ml	Injection	Syringe
Lidocaine HCL	Lidocaine Pre-mix bags	2gm/D5W-500 ml	Injection	Bag

RESPONSOFT ***May 2023***

Drug Formulary List Part B

Pharmacology

Lima Memorial Health System EMS Protocol
Standard Drug Formulary List

Magnesium Sulfate	Magnesium Sulfate	5gm/10ml	Injection	Syringe
Morphine Sulfate	Morphine Sulfate	10mg/ml	Injection	Tubex
Narcan	Naloxone	2mg/2ml	Injection	Syringe
Nitro-Lingual Spray	Nitroglycerin	0.4mg/spray	Spray	Bottle
Nitrostat	Nitroglycerin	0.4mg	Tablet	Sublingual
Nubain	Nalbuphine	10mg/ml	Injection	Amp
Oxygen	Oxygen	100%	Inhalation	
Phenergan	Promethazine	25mg/ml	Injection	Vial
Procainamide	Pronestyl		Injection	Syringe
Proventil	Albuterol	2.5mg/3ml	Inhalation	U/D amp
Racemic Epi	S2 Inhalant	2.25%	Nebulizer	Vial
Rocuronium	Zemuron	10mg/ml	Injection	Vial
Sodium Bicarbonate	Sodium Bicarbonate	50mEq/50ml	Injection	Syringe
Sodium Chloride	Sodium Chloride	0.9% - 1000ml	Injection	Bag
Sodium Chloride	Sodium Chloride	0.9% - 1000ml	Irrigation	Bottle
Solu-Medrol	methylprednisolone	125mg/ml - 2ml	Injection	Vial
Tetracaine HCL	Tetracaine HCL	10mg/ml - 2ml	Injection	Solution
Thiamine	Thiamine (Vit. B-1)	100mg/ml	Injection	Vial
Versed	Midazolam	5mg/ml	Injection	Vial
Water, Sterile	Water, Sterile	1000 ml	Irrigation	Bottle
Zofran	Ondansetron HCL	4mg/2ml	Injection	Vial
Zofran ODT Tablet	Ondansetron ODT	4mg	Tablet	Tablet

Approved:
Dr. Todd Brookens, D.O. **Signature:** _____

Date: May 9, 2023.

Notarized by: Doug LaRue

NOTARIAL SEAL STATE OF OHIO

DOUG LaRUE
Notary Public, State of Ohio
My Commission Expires
3-11-2024

RESPONSOFT ***May 2023***

Interfacility Infusion Maintenance
Amiodarone (Cordarone)

Paramedic

Clinical Indications:
· Control of ventricular arrythmias
· When ordered by a physician with written orders to continue medicated drip during transport

Contraindications:
· Allergy or hypersensitivity to medications.
· Hypotension
· Second Degree Heart Block
· Third Degree Heart Block

Procedure:
1) Follow Universal Care and Wide Complex/V-Tach protocol, when applicable
2) Obtain written orders from transferring physician and include with the patient care documentation
3) Verify concentration, dosage and VS parameters on physician's order sheet from transferring hospital
4) Monitor vital signs: B/P, heart rate every 15 minutes continuous EKG monitoring.
5) Notify Medical Control of the vital signs (heart rate < 110 / > 150, or Systolic BP <90) deviate from the predetermined parameters set forth by the transferring hospital or any AV Block.

Certification Requirements:
· Attend equipment in-services · Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Infusion Maintenance
Antibiotics

Paramedic

Clinical Indications:
· Treatment of bacterial infections. · The list of potential antibiotics that can be transported is extensive. This list contains some examples only. Paramedics may transport all antibiotics/antivirals whether listed or not. - Ciproflaxin, Cefazolin, Ceftoxime - Gentamycin, Vancomycin, Levequin - Amoxicillin, Ampicillin, Penicillin - Doxycycline, Tetracycline – Acyclovir

Contraindications:
· Allergy or hypersensitivity to medications.

Procedure:
1) Paramedics may maintain antibiotic transfusions during inter-hospital transfers that are initiated by the referring facility. These may be peripheral IV lines or PICC lines.

2) Antibiotics/antivirals must be delivered as a piggy-back or secondary line. They should always be run with a compatible main IV line/PICC line such as Normal Saline or other compatible crystalloid IV solution.

3) Some people may have an allergic reaction to antibiotics, particularly Penicillin and similar medicines such as Cephazolin. They can develop side-effects such as a rash, swelling of the face and tongue, and difficulty breathing. This is called an **anaphylactic** reaction and it can be serious or even fatal.

4) During transport, if the patient develops signs or symptoms of an anaphylactoid reaction, turn off the antibiotic and remove bag from main IV line.

5) Establish a second IV line. Do not push any medications through any IV line that may contain residual Antibiotic.

6) Refer to **Anaphylaxis Protocol** and contact On-Line Medical Control for further orders. 7) No other medications may be administered through an antibiotic/antiviral infusion. 8) The Paramedic may transport a patient with an antibiotic/antiviral infusion running through a PICC line

Certification Requirements: · Attend equipment in-services · Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Infusion Maintenance
Cardizem (Diltiazem)

Paramedic

Clinical Indications:
· Control of Atrial Fibrillation or Atrial Flutter with Rapid Ventricular Response
· When ordered by a physician with written orders to continue medicated drip during transport

Contraindications:
· Allergy or hypersensitivity to medications.
· Hypotension · Second Degree Heart Block
· Third Degree Heart Block
· Ventricular Tachycardia

Procedure:
1) Follow Universal Care and Atrial Fibrillation protocol, when applicable
2) Obtain written orders from transferring physician and include with the patient care documentation
3) Verify concentration, dosage and VS parameters on physician's order sheet from transferring hospital
4) Monitor vital signs: B/P, heart rate every 15 minutes continuous EKG monitoring.
5) Notify Medical Control of the vital signs (heart rate < 110 / > 150, or Systolic BP <90) deviate from the predetermined parameters set forth by the transferring hospital or any AV Block.

Certification Requirements:
· Attend equipment in-services · Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Infusion Maintenance
Heparin

Paramedic

Clinical Indications:
· Treatment of acute coronary syndrome/unstable angina/MI
· Treatment of DVT
· Treatment of PE
· Treatment of acute arterial occlusion

Contraindications:
· Allergy or hypersensitivity to medications
· Active hemorrhage
· Gastrointesinal hemorrhage
· Intracranial hemorrhage

Procedure:
1) Heparin infusions started at referring facilities may be maintained by ALS personnel at the rate initiated by the referring facility. Typical treatment regimens include 5000 unit bolus followed by an infusion at 1000 units/hour. Alternate treatment regimens include a weight based dosing determined by the referring facility.

2) Heparin infusions should be maintained at the unit/hour rate determined by the referring facility.

3) Heparin infusions should be discontinued if the patient develops signs of active bleeding or has signs of allergic reaction (rare). On-Line Medical Control should be contacted immediately for further instructions.

4) The Paramedic may maintain an infusion begun through a PICC line.

Certification Requirements: · Attend equipment in-services · Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Infusion Maintenance
Nitroglycerin

Paramedic

Clinical Indications:
· Treatment of chest pain related to acute coronary syndrome/unstable angina/MI.
· Blood pressure control.

Contraindications:
· Allergy or hypersensitivity to medications.
· Hypotension

Procedure: Paramedic's may maintain infusions of nitroglycerine during inter-hospital transfers if the medication is initiated at the referring facility.

If the patient condition changes, contact On-Line Medical Control for orders.

If the patient develops hypotension (SBP<100), turn drip off and contact On-Line Medical Control for orders.

The EMT-P may maintain an infusion begun through a PICC line

Certification Requirements: · Attend equipment in-services · Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Interfacility Infusion Maintenance
Potassium containing solutions
Sodium Bicarbonate Infusions

Paramedic

The Paramedic may maintain the following infusions started at referring facilities:

** IV Solutions containing Potassium such as D51/2NS with 20 Meq KCL
**Sodium Bicarbonate drips (strongly consider recommending Mobile ICU for these patients)

The Paramedic MAY transport KCL infusions that are NOT greater than 10 mEq/hour

ALL patients being transported with these infusions must be monitored with NIBP, SP02, Cardiac monitoring.

Any change in patient condition during transport mandates a call to medical control for further direction.

Interfacility Protonix (Pantoprazole)

Interfacility Transport Protocols

Paramedic

Class

Proton pump Inhibitor

Action

Decreases secretion of gastric acid and chronic reflux

Indication

Patients with upper GI Bleed

Contraindication/Adverse Reactions

- Jaundice
- GI upset
- CNS Symptoms

Precautions

Hypersensitivity to Proton Pump Inhibitor drug class

Side Effects

- Anaphylaxis
- Rash

Equipment

Infusion Pump

How Supplied

40 mg/50 mL
80 mg/100 mL

Dose

Bolus of 80 mg over 5 minutes given to infusion
IV Infusion of 8 mg/hour

Standing Orders

- Routine ALS Care
- Verify infusion rate as well as total time at the transferring facility prior to departure
- Monitor patient closely enroute

Interfacility Infusion Maintenance
Dopamine (Intropin)

Paramedic

Clinical Indications:
· Treatment of hypotension.
· Improve renal perfusion/urine output.

Contraindications:
· Allergy or hypersensitivity to medications.
· Hypertension

Procedure: Paramedics may maintain Vasopressor infusions during inter-hospital transfers that are initiated by the referring facility. Strongly consider Mobile ICU/HEMS transport for unstable patients on multiple infusions etc.

During transport, if the patient develops hypotension (SBP <100mmHg), contact On-Line Medical Control for further orders.

If the patient develops hypertension, (SBP >180 mmHg), stop the infusion and contact On-Line Medical Control.

If the patient develops tachycardia (>120 bpm), contact On-Line Medical Control.

No other medications may be administered through a Vasopressor infusion. The Vasopressor may be infused through a PICC line.

Certification Requirements:
· Attend equipment in-services
· Maintain knowledge of the indications, contra-indications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Lima Memorial Health Systems.

Change Log

Version 1.7 March 2018

Added Dopamine to post arrest hypotension protocol and sepsis/hypotension protocol

-Per ACLS guidelines, Norepinephrine is 1st line, Epi is second line and Dopamine 3rd line

Added Labetalol for paramedics for hypertensive emergencies with end organ damage

Added Ketamine for agitated delirium; ONLY to be used for patient exhibiting violent threat to provider. Must have full monitoring, oxygen, IV established once sedated Added Ketamine for Medication Assisted Intubation (MAI). Removed paralytic from protocol.

Version1.5 December 2015

Updated narcan for all providers
Updated RSI protocol
Updated CHF/CPAP protocol
Updated C-spine clearance protocol to include EMR's (Spinal Motion Restriction)
Added sepsis protocol Modified VT with pulse protocol
Added Norepinephrine for refractory hypotension (Deleted dopamine)
Deleted Captopril from CHF protocol
Added Sodium bicarbonate/potassium containing solutions for Interfac. Transports
Added table of contents
Termination of Resuscitation (TOR guidelines) updated to include BLS only crew configuration

Version 1.0 April 2013

Initial Release

Indications:

An air ambulance may be utilized at the discretion of the incident commander. Conditions that may warrant use of Air Ambulance resources include but are not limited to the following:

1 Patient meets criteria for Trauma/Stroke/STEMI center evaluation.

2 The patient is entrapped and extrication is expected to last greater than 20 minutes.

3. The ground transport time is greater than 15 minutes.

3 The patient is not in traumatic cardiac arrest.

A helicopter may also be utilized when any of the following is present.

~ A situation approved by the medical director or medical control physician - or -

~ Mass Casualty Incident (MCI).

Procedure:

1. The Incident Commander determines that a helicopter is needed for the patient.
2. The Incident Commander notifies dispatch to contact the closest helicopter service for a scene transport. The dispatch center determines which air ambulance is nearest and utilize this resource.
3. A safe landing zone should be established.
4. **Do not delay transport of an ill or injured patient while waiting for a helicopter resource.**

**Due to the National Emergency related to the SARS-CoV2 (COVID-19) outbreak, the following guidelines are implemented for EMS agencies under the medical direction of Dr. Todd Brookens, D.O. This guideline is to be used during times of decreased manpower and does not eliminate the need for common sense. All other protocols are in effect and first responders must maintain care within their scope of practice.*

1.) When you arrive on the scene, assess your patient as usual to determine if they have the signs and symptoms consistent with COVID-19 AND are a candidate to shelter in place or be transported by private vehicle.
***Signs and symptoms of COVID19 include**, but are not limited to:*

- *Fever*
- *Cough*
- *Difficulty Breathing*
- *Exhaustion*

Patients with chest pain, breathing difficulties, hypoxia, abnormal vital signs are not candidates for non-transport unless they sign a refusal of care form. On-Line Medical Control would need to be contacted in the situation as well.

2.) Please refer the patient to the:
ODH hotline at 1-833-427-5634
or the
Community Call Center at 419-226-9000
(7 days a week from 8 am to 5 pm) for further guidance

3.) After completing a medical assessment and determining that an emergency medical condition requiring transport by an EMS professional does not exist and the patient is a candidate to be transported by other means, call On-Line Medical Control for permission to have patient transported by private vehicle

4.) A Patient Care Report must be filled out on all patient encounters.

5.) As always, use excellent customer service skills!

If in doubt, err on the side of transport of the patient.

This protocol goes into effect on March 24, 2020

Indications:

- A pulseless, nonbreathing patient who normally would require resuscitation
  ~ AND **~**
- When out of a medical facility has, on scene, a properly completed, state approved DNR form
  ~ Or **~**
- When in a medical facility has, on scene, either:
  - A properly completed state-approved DNR form,
  - OR a phsyician-signed DNR document,
  - OR a physician-signed order in the facility's chart for that patient.

Procedure:

- Verify that the patient is the person named in the DNR form or order. (If in doubt, resuscitate.)
- Cease all resuscitation efforts.
- Notify law enforcement of patient's death.
- Attach original DNR form or photocopy of the physician's DNR orders to be completed PCR.

Notes:

- When the patient is not in cardiac arrest, requires care, and has a properly completed DNR form, provide care up to the limits of the DNR form and transport both the patient and the DNR form to the hospital.
- Prehospital care professionals cannot honor other legal documents, such as living wills, without first contacting Medical Control for permission. Telephone orders from a patient's physician will not be accepted.
- "Medical facility" is defined to be a facility with continual physician or nursing care during its hours of operation; e.g. hospital, nursing home, physician's office.

A Medical Control Physican only may approve exceptions to this procedure.

Indications:
One or more of the following is present:
- Rigor mortis and/or dependent lividity.
- Decapitation.
- Incineration
- If arrest is traumatic in origin, go to **Trauma Arrest** Protocol.

Procedure:
1. Do not resuscitate any patient who meets the above criteria. If resuscitation efforts are in progress, consider discontinuing the resuscitation efforts.
2. Notify law enforcement and/or the Coroner of the patient's death (or a patient's physician if patient is in a medical facility with continual physician or nursing care during its hours of operation; e.g. hospital, nursing home, physician's office).
3. If any questions or if you need further guidance, please contact medical control.

Note:
If you are unsure whether the patient meets the above criteria, resuscitate.

Do Not Resuscitate Form

Policy:

Any patient presenting to any component of ProMedica Transportation Network with a completed Ohio **Do Not Resuscitate** (DNR) form shall have the form honored and CPR and ALS therapy withheld in the event of cardiac arrest.

Purpose:

- To honor the terminal wishes of the patient.
- To prevent the initiation of unwanted resuscitation.

Procedure:

1. When confronted with a patient or situation involving DNR, the following conditions must be present in order to honor the DNR form and withhold CPR and ALS therapy:

    - Ohio DNR form
    - Effective date and expiration date filled out and current
    - Form signed by a physician, physician's assistant, or nurse practitioner
    - Patient in cardiac arrest

2. A valid DNR form may be overridden by the request of:
    - The patient
    - The guardian of the patient
    - An on-scene physician

3. A living will or other legal documentation that identifies the patient's desire to withhold CPR or ALS therapy may be honored with the approval of Medical Control. This should be done when possible in consultation with the patient's family and personal physician.

Documentation-Patient Care Report (PCR)

Policy:

For every patient contact, the following must be documented at a minimum:

1) A clear history of the present illness including chief complaint, time of onset, associated complaints, pertinent negatives, mechanism of injury, etc. This should be included in the subjective/typed portion of the PCR. The section should be thorough enough to re-create the clinical situation after it has faded from memory.
2) An appropriate physical assessment that may include pupil assessment, breath sounds, motor function, abdominal exam, chest exam, head exam, extremity exam, etc. When appropriate, this information should be included in the procedures section of the PCR.
3) At least two complete sets of vital signs (pulse, respiration, and one auscultated blood pressure). These vital signs should be repeated and documented after every drug administration, prior to patient transfer, and as needed during transport of an ALS Patient. Children age < 6 do not need a BP documented.
4) Non-standard medical abbreviations should be avoided.
5) For drug administrations, you must document dosage of the drug, route of administration, time of administration, and response to drug.
6) A complete listing of treatments performed in chronological order. Any response to these treatments should also be listed.
7) For patients with an extremity injury, neurovascular status must be noted before and after immobilization.
8) For patients with spinal immobilization, document motor function before and after spinal immobilization.
9) For IV administration, the size of the IV catheter, placement of IV, number of attempts, type of fluid, and flow rate.
10) A lead II strip should be attached for all patients placed on the cardiac monitor. Any significant rhythm changes should be documented. For cardiac arrests, the initial strip, ending strip, pre and post defibrillation, pacing attempts, etc. should be attached.
11) 12 lead EKGs, when performed, should also be included in the report and transmitted to the receiving facility.
12) For patients that receive intubation, please note the centimeter mark at teeth, methods to confirm placement, size of ET tube, and number of attempts.
13) Any requested orders, whether approved or denied, should be documented clearly.
14) Any waste of narcotics should include the quantity wasted, and name of the person who witnessed the waste. Hospital personnel should be utilized (if available).
15) All crew members should review the content of the PCR for accuracy..
16) Once the call is completed, patient care information may not be modified for any reason. Corrections or additions should be in the form of an addendum.
17) For all patients who receive EMS medications or procedures (beyond KVO IV), the PCR shall be completed prior to leaving the hospital. Exceptions must be approved by the receiving facility. When possible, all PCRs should be completed prior to leaving the hospital. All PCRs should be available to the receiving facility within 4 hours.

Documentation-Vital Signs

Policy:

Vital Signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives some assessment component.

Purpose:

To insure:

- Evaluation of every patient's volume and cardiovascular status
- Documentation of a complete set of vital signs

Procedure:

1) An **initial** complete set of vital signs includes:

   a) Pulse rate
   b) Systolic **AND** diastolic blood pressure
   c) Respiratory rate
   d) Pain/severity (when appropriate to patient complaint)

2) When no ALS treatment is provided, palpated blood pressures are acceptable for **repeat** vital signs.

3) Based on patient condition and complaint, vital signs may also include:

   a) Pulse Oximetry

   b) Temperature

   c) $EtCO_2$

   d) Carbon Monoxide (CO) level if available

4) If the patient refuses this evaluation, the patient's mental status and the reason for refusal of evaluation must be documented. A patient disposition form must also be completed.

5) Document situations that preclude the evaluation of a complete set of vital signs.

6) Record the time vital signs were obtained.

7) Any abnormal vital sign should be repeated and monitored closely.

Non Transport by ALS

Indications: · A single Paramedic crew or a non-Paramedic/Advanced EMT staffed ambulance, when applicable

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Policy: Generally, the highest care provider should attend the patient in the patient care area. A lower level provider may attend the patient if and only if the higher level provider documents patient stability and is responsible to supervise.

· The provider with the highest level of certification on scene shall conduct a detailed physical assessment and subjective interview with the patient to determine their chief complaint and level of distress. If the ALS provider determines that the patient is stable and all patient care needs can be managed by the lower level provider, patient care can be transferred to a provider of lower certification for transport to a hospital.

All personnel are encouraged to participate in patient care while on-scene; regardless of who "attends" with the patient while enroute to the hospital. The determination of who attends should be based upon the patient's immediate treatment needs and any reasonably anticipated treatment needs while enroute to the hospital. The transporting provider must write a narrative documentation that covers all aspects of assessment, care, and disposition. This should be done on one PCR.

The following patients cannot be transferred to a lower level of certification, have the Paramedic unit cancelled, or be transported by a non-Paramedic ambulance without requesting ALS intercept:

- Postictal seizure patients due to the possibility of a re-occurrence of a seizure.
- Patients who have been medicated on the scene may only be transferred to a technician of lower certification whose formulary includes the medications that were administered.
- Any patient suffering from chest pain of suspected cardiac origin, respiratory distress, hypertensive emergencies, multiple trauma, or imminent childbirth.
- Any patient in which transport would be delayed by waiting for a unit with lesser certification to arrive.

All Levels of Certification

- Competent patients maintain the right to refuse care and/or transport. If unsure, contact On-Line Medical Control.
- All patients refusing service will be:
  - Informed of the availability of service and offered treatment and transport in a nonconfrontational, polite manner,
  - Advised to call 911 for emergency service if desired, and
  - Advised that they accept full responsibility for their actions.
- Contact Medical Control if ALS has been started and patient declines transport. Give the Medical Control Physician an explanation by recorded device of the situation and request permission to discontinue ALS. The name of the physician who gave the order must be documented in the PCR.
- The only exception to contacting Medical Control is after treating hypoglycemia and the patient meets the criteria for declining transport.
- Documentation:
  - In the report narrative, describe the patient encounter, vital signs, advice given, that the patient is alert and orientated to person, place, and time, and that the patient understands instructions given to him/her.
  - If possible, have the patient sign the AMA form, have a third party witness the signature, and give a copy to the patient.
  - Complete the "Patient Refusal of Care" procedure in the electronic call report.
- At no time will EMS professionals mention cost of transport, patient's insurance status, hospital billing or insurance practices, status of system/unit availability, or any other non-clinical subject in an attempt to influence a patients decision to accept or decline transport.

All Levels of Certification

Indications:

- A patient who wishes to take his/her own medication or prescription.

Procedure:

- Patient assisted Auto-Injector Epinephrine==>EMR and above
- Patient assisted Nitroglycerin==>EMT and above
- Patient assisted aerosolized/nebulized medications==>EMT and above

Patients Who Present Without a Protocol

Policy:

Anyone requesting EMS service will receive emergent evaluation, care, and an offer of transportation in a systematic, orderly fashion regardless of the patient's problem or condition.

Purpose: ·

To ensure the provision of appropriate medical care for every patient regardless of the patient's problem or condition.

Procedure:

1) Treatment and medical direction for all patient encounters, which can be triaged into an EMS patient protocol, is to be initiated by protocol.

2) When confronted with an emergency or situation that does not fit into an existing EMS patient care protocol, the **Universal Patient Care Protocol** should be used to treat the patient, and a **Medical Control Physician** should be contacted for further instructions.

Physician on Scene

Policy:

- The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the State of Ohio

Indications:

- An Ohio licensed physician at the scene who wishes to assume medical responsibility for the patient. .

Procedure:

- If a pre-existing "physician-patient" relationship does not exist, contact On-Line Medical Control for physician authorization; the Medical Control physician will decide if the on-scene physician will be allowed to take control of patient care and issue medical orders.

- If a pre-existing "physician-patient" relationship does exist, the physician is authorized to take control of patient care and issue medical orders.

- Follow the orders of the authorized physician even if they conflict with the existing local protocols provided they encompass skills and medications approved by both the Lima Memorial Health Systems Medical Director and the State Medical Board.

Practitioner Disciplinary Procedure Part A

In the Lima Memorial Health Systems EMS System, a practitioner's right to practice medicine is based on extension of the Medical Director's license to practice medicine. If, in the opinion of the Medical Director, an action (or failure to act) on the part of a practitioner is of such a nature that the action of failure to act is inconsistent with, or a violation of, these procedures, or the BLS/ALS practice standard generally accepted in the medical community, the actions described below shall occur.

1) The practitioner will be notified in writing of the issues/concerns that merit the attention of the Medical Director. Notwithstanding this written notice provision, the provisions of 2 and 3 below, and based on the severity and nature of the act (or failure to act), the Medical Director may suspend a practitioner's right to practice BLS/ALS skills upon receipt of information sufficient in the judgment of the Medical Director or EMS Manager to support immediate suspension in the interest of patient safety.

2) A written explanation by the individual explaining the incident shall be presented to the Medical Director and EMS Managere within three (3) working days of receipt of the Medical Director's issues/concerns. If no written explanation of the incident is sent to the Medical Director by that deadline, the Medical Director may base his decision upon such information that is available to him as of that deadline.

3) The Medical Director or the individual may request a second meeting to further discuss the issues/concerns. If this option is exercised, the meeting shall occur within five (5) working days of receipt of the request.

4) After reviewing all materials, the Medical Director will issue a disposition of the matter. The Medical Director may exercise one or more of the following options:
    a) No action taken/matter resolved
    b) Remediation training
    c) Warning
    d) Require to precept at the approved level again
    e) Temporary suspension of all BLS/ALS practice privileges or suspension of specific BLS/ALS practice privileges
    f) Revocation of BLS/ALS practice privileges

Such suspension and/or revocation of BLS/ALS practice privileges will extend to all jurisdictions where the BLS/ALS practitioner's right to practice relies on the extension of the LMHS EMS Medical Director's license to practice medicine.

5) After the individual is notified in writing of the Medical Director's decision, he/she may appeal to the Medical Director. This appeal request must be presented within five (5) working days of the decision of the Medical Director to the Medical Director or the EMS Manager for referral to the EMS Liaison Team.

6) The EMS Liaison Team will meet within ten (10) working days of receipt of the appeal request. It shall consist of the following representatives:

    a) The EC Medical Director
    b) The EMS Medical Director
    c) The EMS Manager
    d) The EC Director
    e) The Trauma Program Manager
    f) The EC Clinical Manager

7) The EC Medical Director will function as the presiding officer for purposes of hearing an appeal. The EMS Liaison Committee may hear witnesses (the participation of which is the responsibility of the party calling the witness) and consider documentary and other evidence. The decision of the EMS LiaisionCommittee shall be in the form of written findings of fact and imposition of action(s) consistent with those findings of fact.

8) The decision of the EMS Liaison Committee is final. The written finding of facts and actions decision will be presented to the appellant ALS practitioner within five (5) working days of the conclusion of the EMS Liaison Team hearing.

9) Until the Patient Safety Subcommittee of the Peer Review CommitteeEMS Liaison Team meets in hearing, the Medical Director's action(s) as described in 4, above, will stand.

10) If a permanent revocation of ALS privileges is approved, the State Office of EMS will be notified of the decision.

The authority conferred herein does **not** apply to conduct or behavior outside the sphere of BLS/ALS practice that relies upon the Medical Director's extension of right-to-practice. It does **not** authorize actions other than warnings, warnings with limitation on certain practices, temporary suspension of BLS/ALS practice rights or revocation of BLS/ALS practice rights. Actions taken pursuant to this Procedure shall be reported to the BLS/ALS practitioner's employer, who may undertake disciplinary actions independent of the actions referred to herein.

Safe Transport of Pediatric Patients

Policy:

Without special considerations children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection to pediatric persons during EMS transport.

Purpose:

To provide:

- A safe method of transporting pediatric persons within an ambulance.
- Protection of the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

Procedure:

1) Drive cautiously at safe speeds observing traffic laws.
2) Tightly secure all monitoring devices and other equipment.
3) Insure EMS personnel, the patient, and any other occupants use available restraint systems.
4) Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle whenever possible.
5) Do not allow parents, caregivers, or other passengers to be unrestrained during transport.
6) Do not have the child/infant held in the parent's, caregiver's or EMS personnel's arms or lap during transport.
7) For patients with respiratory distress or other medical conditions that can be worsened by stress, make every attempt to optimize safety while comforting the child.

Policy:

Discontinuation of cardiopulmonary resuscitation and other advanced life saving interventions may be considered
when ALL of the following criteria have been met:

Procedure:

___ Adequate CPR has been administered for at least 25 minutes without ROSC
___ Endotracheal intubation and/or supraglottic airway (SGA) placement has been successfully accomplished with adequate ventilation (as per Airway protocol);
___ IV/IO access has been achieved (Unless BLS ONLY crew on scene, No ALS available)
___ Rhythm-appropriate medications and defibrillations for shockable rhythms have been administered according to protocol; **BLS** = No shock advised by AED 3 times during 20 minutes of high quality CPR
___ Persistent asystole or agonal rhythm is present and no reversible causes are identified; BLS= No Shock advised 3 times during high quality CPR with BLS only crew.
___ Failure to establish spontaneous circulation =ROSC as described above.
___ Patient must be at least 18 years of age.
___ Body temperature is at least 35 centigrade (95°F) for a patient who is submerged in cold water (water temperature less than 47°F (8.5 centigrade)
___ Medical control contacted for permission to terminate resuscitation

- Family members and others present must be acknowledged and assisted.
- Disposition of the body as per the Deceased Persons Protocol.

Trauma Center Triage Criteria

Goal: To provide quality care to all trauma patients while maximizing utilization of resources in the most cost efficient manner.

Rationale: Some trauma patients require a full range of trauma services while a percentage need only modified trauma resources. A tiered system will ensure availability of services based upon clinical presentation of the trauma patient.

Procedure: Pre-hospital personnel will provide clinical information to the Emergency Department. The Emergency Department Physician, in collaboration with pre-hospital personnel, will make a determination as to resources required by the patient, either full trauma resources or modified trauma resources. The Emergency Department Physician will make the final decision on level of resources. **The Emergency Department Physician will make the final decision on level of resources.**

Trauma Level I

Level I Criteria:

Trauma Physician within 15 minutes

GCS < 14

Systolic BP < 90, age 6-adult, <70 age 0-5

Heart Rate > 130

Respiratory Rate <10 or > 29

Facial Trauma with impending airway compromise
Intubated prior to arrival

Flail chest or open pneumothorax

Penetrating injury to head, neck, torso, or extremities proximal to knee or elbow

Bleeding uncontrolled proximal to wrist/ankle

Inhalation injury with or without burns

Trauma with 20% BSA burns

Suspected two or more long bone fractures proximal to knee or elbow

Amputation proximal to wrist or ankle

Suspected pelvic fracture

Paralysis in the field

Emergency Center Physician Discretion, related to EMS suspicion of high-energy impact and /or presence of co-morbid factors.

Trauma Level II

Level II Criteria

Trauma Physician within 15 minutes

Open Fractures proximal to elbow or knee
Crush injury proximal to wrist or elbow
Pedestrian, bicycle struck by vehicle > 5 MPH impact thrown over or run over

Motorcycle, ATV crash with separation of rider from bike and speed > 20 MPH

Ejected from vehicle

High speed collision (>60 MPH or > 40 MPH unrestrained) or major vehicle deformity (20")
Falls >12' (Adult) or > 3 times a child's height
Trauma with burns >5% and < 20% BSA

Death in passenger compartment

Extrication time of > 20 minutes

Emergency Center Physician Discretion
Hanging/traumatic asphyxiation

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the LMHS EMS System.

12 Lead ECG

Procedures

EMT
Set-up & transmit only

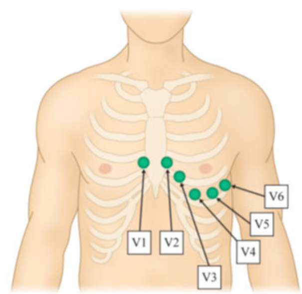
AEMT

Clinical Indications

- Suspected cardiac patient (Chest pain, dyspnea, weakness, fatigue)
- Electrical injuries
- Syncope
- CHF

Steps — **Was performed ?** (YES / NO)

1. Assess patient and monitor cardiac status
2. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG
3. Prepare ECG monitor and connect patient cable with electrodes.
4. Expose chest and prep as necessary. Modesty of the patient should be respected.
5. Apply chest leads and extremity leads using the following landmarks:
   - RA -Right arm or as directed by manufacturer
   - LA -Left arm or as directed by manufacturer
   - RL -Right leg
   - LL -Left leg
   - V1 -4th intercostal space at right sternal border
   - V2 -4th intercostal space at left sternal border
   - V3 -Directly between V2 and V4
   - V4 -5th intercostal space at mid-clavicular line
   - V5 -Level with V4 at left anterior axillary line
   - V6 -Level with V5 at left mid-axillary line



6. Instruct patient to remain still.
7. Press the appropriate button to acquire the 12 Lead ECG.
8. Print data as per guidelines and attach a copy of the 12 lead to the PCR. Place the name and age of the patient on the paper copy of the ECG.
9. If STEMI suspected, if able, transmit 12-Lead ECG and notify hospital of STEMI alert.
10. Document the procedure, time, and results on/with the patient care report (PCR)
11. An EMT may obtain and transmit a 12 Lead ECG; a Paramedic, however, should interpret it before implementing any treatment modalities.

Airway-Orotracheal Intubation

AEMT

Clinical Indications:

- Patients with unprotected airway/hypoxia/critical condition/Sepsis
- Multiple trauma patient
- Respiratory arrest/ Cardiac arrest:

Contraindications:

- Presence of gag reflex.
- Relative contraindications: o Blood clotting abnormalities o Upper neck hematomas or infections

General

Steps	Was performed ? YES	NO
1. Prepare, position and oxygenate the patient with 100% oxygen	☐	☐
2. Select proper ET tube (and stylette, if used), have suction ready.	☐	☐
3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).	☐	☐
4. Limit each intubation attempt to 30 seconds with BVM between attempts. **AVOID HYPOXIA**	☐	☐
5. Visualize tube passing through vocal cords.	☐	☐
6. Inflate the cuff with 3 to 10 cc of air; secure the tube to the patient's face.	☐	☐
7. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with bag-valve mask.	☐	☐
8. Consider using King LTS-D / i-gel if ET intubation efforts are unsuccessful.	☐	☐
9. **Apply waveform capnometry and record readings on scene, enroute to the hospital, and at the hospital. Maintain ETC02 between 35-45 mmHg. Avoid overventilation**	☐	☐
10. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.	☐	☐

EMR

EMT

AEMT

Paramedic

Med Control

Airway-Suctioning-Basic

EMT

Clinical Indications:

Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

Steps	Was performed ? YES	NO
1. Ensure suction device is in proper working order with suction tip in place.		
2. Preoxygenate the patient as is possible.		
3. Explain the procedure to the patient if they are coherent.		
4. Examine the oropharynx and remove any potential foreign bodies or material that may occlude the airway if dislodged by the suction device.		
5. If applicable, remove ventilation devices from the airway.		
6. Use the suction device to remove any secretions, blood, or other substance.		
7. The alert patient may assist with this procedure.		
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient.		
9. Record the time and result of the suctioning in the patient care report (PCR).		

General

EMR

EMT

AEMT

Paramedic

Med Control

Airway-Suctioning - Advanced

EMT

Clinical Indications:

Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assessed by an airway adjunct such as a naso-tracheal tube, endotracheal tube, tracheotomy tube, or a cricothyrotomy tube.

Steps	Was performed ? YES	NO
1. Ensure suction device is in proper working order.	☐	☐
2. Preoxygenate the patient,	☐	☐
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.	☐	☐
4. For all devices except King, use the suprasternal notch and the end of the airway into which the catheter will be placed as guides, measure the depth desired for the catheter (judgement must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes). If using a King, suction only from the lumen of the King. Do not attempt to suction beyond the length of the King as this may promote laryngospasm.	☐	☐
5. If applicable, remove ventilation devices from the airway.	☐	☐
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.	☐	☐
7. Once desired depth (measured in number 4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.	☐	☐
8. Small volume (< 10 ml) of normal saline lavage may be used as needed.	☐	☐
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient.	☐	☐
10. Document time and result in the patient care report (PCR)	☐	☐

General

EMR

EMT

AEMT

Paramedic

Med Control

Blood Glucose Analysis

EMT

Clinical Indications:

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

Steps	Was performed ? YES	NO
1. Gather and prepare equipment	☐	☐
2. Blood samples for performing glucose analysis should be obtained simultaneously with intravenous access when possible	☐	☐
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.	☐	☐
4. Time the analysis as instructed by the manufacturer.	☐	☐
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.	☐	☐
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.	☐	☐
7. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings, and/or as recommended by the manufacturer and document in log.	☐	☐

General

EMR

EMT

AEMT

Paramedic

Med Control

Cardioversion

Paramedic

Clinical Indications:

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

Steps	Was performed ? YES	NO
1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.	☐	☐
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.	☐	☐
3. Consider the use of pain and/or sedating medications (i.e. midazolam/fentanyl) dosing listed under appropriate protocol)	☐	☐
4. Set energy selection to the appropriate setting.	☐	☐
5. Set monitor/defibrillator to synchronized cardioversion mode.	☐	☐
6. Make certain all personnel are clear of patient.	☐	☐
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there my be a delay between activating the cardioversion and the actual delivery of energy.	☐	☐
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.	☐	☐
9. If the patient's condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.	☐	☐
10. Repeat until maximum setting or until efforts succeed.	☐	☐
11. Note procedure, response, and time in the patient care report (PCR)	☐	☐

General
EMR
EMT
AEMT
Paramedic
Med Control

EMR

Clinical Indications:

Basic life support for the patient in cardiac arrest

Steps	Was performed ? YES	NO
1. Assess the patient's responsiveness (No breathing or no normal breathing	☐	☐
2. Activate Emergency Response/Get Defibrillator	☐	☐
3. Start CPR -->Push Hard and Fast-->adequate rate and depth with complete chest recoil after each compression, MINIMIZE Interruptions in compressions, AVOID Excessive ventilation	☐	☐
4. C-A-B (Not ABC): Compressions--Airway--Breathing	☐	☐

Age	Location	Depth	Rate
Infants (Age less than 1 year, excluding newborns)	Over sternum between nipples (inter-mammary line), 2-3 fingers	0.5 to 1 inch (1/3 the anteriorposterior Chest dimension)	100 - 120/minute
Children (Age 1 year to puberty)	Over sternum, just cephalad from xiphoid process, heel of one hand	1 to 1.5 inches (1/3 the anteriorposterior Chest dimension)	100 - 120/minute
Adults and Adolescents	Over sternum, just cephalad from xiphoid process, hands with interlocked fingers	Over sternum, just cephalad from xiphoid process, heel of one hand	100 - 120/minute

5. Go to Cardiac Arrest procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure.	☐	☐
6. Provide no more than 12 breaths per minute with the BVM. Use $EtCO_2$ to guide your ventilations as directed in the Cardiac Arrest Procedure.	☐	☐
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions are allowed for rhythm analysis, defibrillation, and performance of procedures.	☐	☐
8. Document the time and procedure in the Patient Care Report (PCR).	☐	☐
9. If an automatic CPR device is available, apply device to patient and follow manufacturer instructions for use (Adult patients only)	☐	☐
10. 30 Degree Head Up positioning for CPR	☐	☐

EMR

Indications:

* Basic life support for patient in Cardiac Arrest

Procedure: ALL CERTIFICATION LEVELS: **EMR, EMT, AEMT, Paramedic**

* Assess Level of consciousness (Not breathing, Abnormal breathing

* Bring AED to patient's side and activate

* Begin CPR with adequate rate and depth and achieving complete chest recoil between compressions.
  -Minimize interruptions
  -Avoid over-ventilation
  -Push "hard and fast"
  -Utilize automated CPR device if available per manufacturer recommendations

*C-A-B (not ABC's any more) Focus on effective Compressions, focus on effective uninterrupted compressions. Do not interrupt compressions for airway maneuvers. An SGA (iGel or King is an acceptable alternative to intubation in cardiac arrest

Age	Location	Depth	Rate
Infant	Sternum between nipples 2-3 fingers	0.5 inches	100-120/min
Child	Sternum Heel of one hand	1-1.5 inches	100-120/min
Adult	Sternum Both hands	1.5-2 inches	100-120/min

* Go to Cardiac Arrest Procedure

* 6-8 breaths/minute

* Avoid interruptions in compressions (load shock on defibrillator; dump charge if non-shockable rhythm or AED advises "NO SHOCK ADVISED"

* Document time CPR started in Patient care report (PCR)

* Always follow most curent AHA Guidelines for CPR

Cricothyrotomy -Front of Neck Airway (FONA) "Scalpel-Finger-Bougie- Cric"

Paramedic

Indications:

A patient in need of definitive airway in which you are unable to adequately ventilate due to an obstructed airway. A patient that can be adequately ventilated by other means (BVM, Nasopharyngeal/oral airway, supraglottic airway) does not require a cricothyrotomy The only patients that qualify for a cricothyrotomy are those with an obstructed airway and inadequate ventilation.

Types of patients with obstructed airways that may need cricothyrotomy
- -Direct trauma to larynx
- -Anaphylactic reactions
- -Food or other object in the airway (choking)

Steps	Was performed ? YES	NO
1. Assemble all equipment (suction, BVM, ETT, Scalpel, end-tidal CO_2 monitor, oxygen)	☐	☐
2. Extend the head if not contra-indicated (spine fracture)	☐	☐
3. Identify landmarks (Thyroid cartilage, cricothyroid membrane)	☐	☐
4. Make vertical incision over the cricothyroid membrane with #11 scalpel down to the cricothyroid membrane.	☐	☐
5. Make horizontal incision through cricothyroid membrane: Slide bougie into trachea	☐	☐
6. Place appropriately sized endotracheal tube over bougie into trachea The bougie is then removed and tube left in place	☐	☐
7. Ventilate patient and measure end-tidal CO_2 with waveform capnography	☐	☐
8. Secure tube in place. Avoid migration of tube and main-stem bronchus intubation	☐	☐
9. Control bleeding at site of incision with gauze and direct pressure	☐	☐
10. Contact Medical Control as soon as possible and transport to closest appropriate facility	☐	☐

For departments using the Quick Trach device, this may be used in lieu of the above protocol

Defibrillation-Automated

Clinical Indications: **(MANUAL Defibrillation)**

EMR

Patients in cardiac arrest (pulseless, non-breathing).
Age < 8 years, use Pediatric Pads if available.

Contraindications:

Pediatric patients who body habitus is such that the pads cannot be placed without touching one another.

Steps	Was performed ? YES	NO
1. **If multiple rescuers are available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**	☐	☐
2. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions.	☐	☐
3. Remove any medication patches on the chest and wipe off any residue.	☐	☐
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.	☐	☐
5. Activate AED for analysis of rhythm.	☐	☐
6. **Stop CPR and clear the patient** for rhythm analysis. Keep interruption in CPR as brief as possible.	☐	☐
7. Defibrillate if appropriate by depressing the "shock" button. **Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation**. The sequence of defibrillation charges is pre-programmed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.	☐	☐
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.	☐	☐
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.	☐	☐
10. If "no shock advised" appears, perform CPR for two minutes and then reanalyze.	☐	☐
11. Transport and continue treatment as indicated.	☐	☐
12. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.	☐	☐

General
EMR
EMT
AEMT
Paramedic
Med Control

If pulse returns:

See: Post Resuscitation protocol.

(MANUAL Defibrillation)

AEMT

Clinical Indications:

Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia.

Steps	Was performed ? YES	NO
1. **Ensure chest compressions are adequate and interrupted only when necessary.**		
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.		
3. Apply hands free pads to the patient's chest in the proper position (Anterior-Posterior position)		
4. Set the appropriate energy level.		
5. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**		
6. Hold compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.		
7. Deliver the countershock by depressing the **shock button** for hands free operation.		
8. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.		
9. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.		
10. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**		

IM Injection Needle Sizes

Patient Age	Injection Site	Needle Size	Maximum Solution
Newborn (0 – 28 days)	Anterolateral thigh muscle	5/8" (22 - 25 gauge)	1 mL
Infant (1 – 2 months)	Anterolateral thigh muscle	1" (22 - 25 gauge	1 mL
Toddler (1 – 2 years)	Anterolateral thigh muscle **Alternate Site**: Deltoid muscle of arm if muscle mass is adequate	1 - 1 1/4" (22 - 25 gauge) 5/8 - 1" (22 - 25 gauge)	1 mL
Children (3 – 18 years)	Deltoid muscle (upper arm) **Alternate Site**: Anterolateral thigh muscle	5/8 - 1" (22 - 25 gauge) 1 - 1 1/4" (22 - 25 gauge)	1 mL 2 mL
Adults (19 years and older)	Deltoid muscle (upper arm) **Alternate Site**: Anterolateral thigh muscle	1 * 1 1/2 (22 - 25 gauge) 1 - 1 1/2 (22 - 25 gauge)	2 mL 5 mL

Intranasal Medication Administration

EMR (Narcan only)

AEMT

Clinical Indications:

Patient without IV access requiring urgent medication administration (e.g., active seizure; opiat

Steps	Was performed ? YES	NO
1. Determine appropriate medication dose per applicable protocol.		
2. Draw medication into syringe and carefully dispose of any sharps.		
3. Place mucosal atomizer on the end of the syringe and screw into place.		
4. Gently insert the atomizer into the naris. Stop once resistance is met.		
5. Rapidly administer the medication, 1/2 of dose desired in each nare. Not more than 2 ml of fluid may be administered per nostril		
6. Document the results in the PCR.		

Medications approved for use IntraNasal are:

1. Fentanyl (Sublimaze)
2. Glucagon
3. Ketamine (Ketalar)
4. Naloxone (Narcan) (2 mg/2ml only)
5. Midazolam) Versed
6. Ondansetron (Zofran)

Minor Wound Care

EMR

Clinical Indications:

Protection and care for open wounds prior to and during transport.

Steps	Was performed ? YES	NO
1. Use personal protective equipment, including gloves, gown, and mask as indicated.		
2. If active bleeding, hold direct pressure and elevate the affected area if possible. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.		
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.		
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.		
5. Monitor wounds and/or dressings throughout transport for bleeding.		
6. Document the wound and assessment and care in the Patient Care Report (PCR).		

Needle Chest Decompression

AEMT

Clinical Indications:

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

~ OR ~

- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Steps	Was performed ? YES	NO
1. Don personal protective equipment (gloves, eye protection, etc.).	☐	☐
2. Administer high flow oxygen.	☐	☐
3. Identify and prep the site: ▪ Locate the second intercostal space in the mid-clavicular line on the same side as the pneumothorax. ▪ Prepare the site with povidone-iodine ointment or solution. [Note: If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.]	☐	☐
4. Insert the catheter (preferred 3.25 inch ARS catheter) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.	☐	☐
5. Advance the catheter through the parietal pleura until a "pop" is felt and the air or blood exits under pressure through the catheter, then advance catheter only to chest wall.	☐	☐
6. Remove the needle, leaving the plastic catheter in place.	☐	☐
7. Secure the catheter hub to the chest wall with dressings and tape.	☐	☐
8. Consider placing a finger cut from an sterile exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note - don't waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)	☐	☐

General
EMR
EMT
AEMT
Paramedic
Med Control

Non-Invasive Ventilation-CPAP

EMT

Clinical Indications:

CPAP indicated for patients over age 12 with pulmonary edema, COPD, Asthma, CHF, pneumonia, submersion injury, respiratory failure who is cooperative and has spontaneous respirations. These patients may demonstrate hypoxia (SpO2 <
Tachypnea, retractions, accessory muscle use, rales (crackles) in lung fields **Contraindications:**
Patient's requiring a secure airway (i.e. endotracheal intubation)

Contraindications:

Depressed LOC (i.e. GCS <9; Hypotension (SBP <90mmHg); Respiratory or Cardiac Arrest; major trauma/facial injury; uncontrolled vomiting; Known or suspected pneumothorax; gastric distention (i.e. bowel obstruction. Patients who are unabl
maintain their own airway are NOT candidates for CPAP

General

Steps	Was performed ? YES	NO
1. Ensure adequate oxygen supply to ventilation device.		
2. Explain the procedure to the patient.		
3. Consider placement of a nasopharyngeal airway.		
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing at this point.		
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.		
6. Evaluate the response by the patient. Assess breath sounds, oxygen saturation, and general appearance of the patient.		
7. Titrate oxygen to patient response. **5 cm H20 for Asthma, COPD, Submersion injury, Pneumonia; 10 cmH20 for CHF/ Acute Pulmonary Edema**		
8. Encourage the patient to allow forced ventilation occur. Observe closely for signs of complication. The patient must be breathing on their own for optimal use of the CPAP device.		
9. Document time and response on patient care report (PCR).		

EMR

EMT

AEMT

Paramedic

Med Control

Spinal Motion Restriction

EMR

Goals: Minimize secondary injury to spine in patients who have, or may have an unstable spinal injury

Minimize patient morbidity from immobilization procedures

Assessment: ALL LEVELS = **EMR, EMT, AEMT, PARAMEDIC**

1: assess scene to determine risk of injury; mechanism alone should not determine need to immobilize. High risk mechanisms = MVC's, Axial loading injuries to spine, Falls > 10 feet

2: assess patient in position found. Determine if C-collar needs to be applied

3: assess mental status, neurologic deficits, spinal pain or tenderness, evidence of intoxication or other severe injuries

Treatment:

1: Immobilize with c-collar if there are any of the following
- a: Patient complains of midline neck or spine pain
- b: Any midline neck or spinal tenderness with palpation
- c: Any abnormal mental status, neuro deficit, extreme agitation
- d: Any alcohol or drug intoxication
- e: Another painful distracting injury present
- f: Torticollis in children

2: Penetrating injury to neck ***should not*** receive spinal immobilization unless neurologic deficit is present

3: If extrication is required from vehicle, place c-collar if indicated and allow patient to self-extricate if able. Extricate infants and toddlers in car seats while strapped to car seat. Other situations requiring extrication may use a padded long board using lift and slide technique

4: **Patients should not routinely be transported on long boards u**nless clinical situation warrants its use. If used, long boards should be padded or have a vacuum mattress applied to minimize secondary injury to the patient

Safety considerations: Be aware of potential airway compromise/aspiration/nausea and vomiting, facial and oral bleeding. Tight straps can limit chest excursion, pressure injures to skin possible, spine board is uncomfortable

Patients likely to benefit from immobilization should undergo this treatment

Patients who are not likely to benefit from immobilization should not be immobilized

Ambulatory patients may be safely immobilized on gurney with c-collar

Long spine boards should be reserved for patient movement in non-ambulatory patients who meet immobilization criteria and should be removed as soon as is practical

Splinting

EMR

Clinical Indications:

- Immobilization of an extremity for transport, either due to suspected fracture, sprain or injury.
- Immobilization on an extremity for transport to secure medically necessary devices such as intravenous catheters.

Steps	Was performed ? YES	NO
1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.	☐	☐
2. Remove all clothing from the extremity.	☐	☐
3. Select a site to secure the splint one joint proximal and distal to the area of suspected injury, or the area where the medical device will be placed.	☐	☐
4. Do not secure the splint directly over the injury or device.	☐	☐
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.	☐	☐
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess.	☐	☐
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint: a) Assess neurovascular function as in #1 above. b) Place the ankle device over the ankle. c) Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis. d) Extend the distal end of the splint at least 6 inches beyond the foot. e) Attach the ankle device to the traction crank. f) Twist until moderate resistance is met. g) Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.	☐	☐
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).	☐	☐

General
EMR
EMT
AEMT
Paramedic
Med Control

Supraglottic Airway (SGA) iGel/King LT

Clinical Indications:

- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Intubation is impossible due to patient access or difficult airway anatomy

.

Absolute Contraindications:
Deforming facial trauma

Relative Clinical Contraindications:
Pulmonary fibrosis · Morbid obesity

EMT (apneic only)

AEMT

General

Steps	Was performed ? YES	NO
1. Prepare, position and oxygenate the patient with 100% Oxygen.		
2. Choose proper size SGA airway per package recommendations.		
3. Check the tube for proper inflation and deflation. iGel does not require inflation		
4. Lubricate with a water-soluble jelly.		
5. Insert the King airway rotated 45 degrees into posterior pharynx. Rotate into position; insert the iGel in the midline until it seats. No inflation required		
6. Inflate the cuffs per the manufacturer's recommendations until a seal is obtained.		
7. Connect the SGA to a BVM and assess for breath sounds and air entry.		
8. **Apply end tidal carbon dioxide monitor and record readings at the scene, enroute to the hospital, and at the hospital.**		
9. Re-verify King placement after every move and upon arrival in the ED.		
10. Document the procedure, time, and result on the patient care report (PCR).		

EMR

EMT

AEMT

Paramedic

Med Control

Taser Barb Removal

EMT

Clinical Indications:

When TASER darts have been deployed by Law Enforcement Officers to subdue adult (17 years and older) perpetrators.

Steps	Was performed ? YES	NO
1. Once a TASER has been used against a perpetrator and the scene has been secured, a medical evaluation is necessary to ensure that the perpetrator is safe to be taken int custody.	☐	☐
2. **The default procedure is always to transport the patient to the hospital by ambulance with a Law Enforcement Officer (LEO) in attendance.**	☐	☐
3. Recognize that a TASER dart removal in the field should proceed only if **ALL** criteria for refusal of transport are met.	☐	☐
4. After a 10 minute observation period in the field (starting from arrival at the patients side) all of the following criteria must be met: - The patient must have a GCS of 15 - Patient must have a heart rate of > 110 bpm, a respiratory rate of > 12 bpm, Systolic BP of > 100mmHg and < 180 mmHg - The patient has no other acute medical or psychiatric conditions requiring physician evaluation - All TASER barbs have been accounted for - No tetanic muscle contractions - Patient does not request transport - Patient is > than 17 years of age - Patient has a current Tetanus Booster (If the patient has not had a Tetanus booster within 10 years or the status is unknown, LEO may transport to the hospital if all other criteria are met.) - **Law Enforcement are to be informed that it is the responsibility of the LEO to ensure that the patient receives a tetanus booster within 72 hours.**	☐	☐
5. Once all of the above criteria have been met, the following steps must be followed: - Use scissors to cut the wires. - Wearing PPE, grasp the dart and remove with a quick, firm pull, perpendicular to the skin of the patient. - Clean and cover each wound, as per Minor Wound Care Protocol. - Follow Refusal of Transport Protocol.	☐	☐

General
EMR
EMT
AEMT
Paramedic
Med Control

Transcutaneous Pacing

Clinical Indications:

- Monitored heart rate less than 60 per minute with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
  - o Chest pain
  - o Hypotension
  - o Pulmonary edema
  - o Altered LOC, disorientation, confusion, etc.
  - o Ventricular ectopy.

Paramedic

General

Steps	Was performed ? YES	NO
1. Attach standard four-lead monitor.		
2. Apply defibrillation/pacing pads to chest and back: preferred alternative placement is Apex and Lateral • One pad to left mid chest next to sternum, one pad to mid left posterior chest next to spine.		
3. Rotate selector switch to pacing option.		
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.		
5. Note pacer spikes on EKG screen.		
6. Slowly increase output until capture of electrical rhythm on the monitor.		
7. If unable to capture while at maximum current output, stop pacing immediately.		
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.		
9. Consider the use of sedation or analgesia if patient is uncomfortable.		
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.		

EMR

EMT

AEMT

Paramedic

Med Control

Transport Medical Device

Indications
- Transport of an intubated or trach patient

Signs and symptoms
- Patient currently breathing with ventilation device.

Contraindications
- Insufficient training

Paramedic

	YES	NO
1. Confirm the placement of tube as per airway protocol.		
2. Ensure adequate oxygen delivery to the ventilator device.		
3. Pre-oxygenate the patient as much as possible with BVM.		
4. Remove BVM and attach ventilation device.		
5. Per instructions of device, set initial respiration values; respiratory rate and volume.		
6. Assess breath sounds. Allow for adequate expiratory time. Adjust ventilator setting as clinically indicated.		
7. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the ventilator, remove and resume bag-valve ventilations.		
8. Document time, complications, and patient response on the patient care report (PCR).		

IF THERE IS EVER ANY QUESTION ABOUT WHETHER OR NOT THE DEVICES IS VENTIALTING CORRECTLY, REMOVE IT AND VENTILATE MANUALLY.

PARAMEDICS MUST RECEIVE TRAINING REGARDING THEIR SPECIFIC VENT DEVICE.

KEY POINTS
Transportation ventilators may be used on successfully intubated patients according to the manufacturer's directions.
It must be noted that this is a short term adjunct, which must be monitored at all times to prevent tube displacement. If the patient begins to show any signs of further deterioration, the entire airway must be re-evaluated and a bag-valve-mask should be used until the airway can be successfully stabilized.

Venous Access-Existing Catheters

AEMT

Clinical Indications:

- Inability to obtain adequate peripheral access for patient requiring emergency medication administration.
- Should not be accessed for routine use
- Access of an existing venous catheter for medication or fluid administration in emergency situation
- Central venous access in a patient in cardiac arrest.

Steps	Was performed ? YES	NO
1. Clean the port of the catheter with alcohol wipe.	☐	☐
2. Using sterile technique, withdraw 5 - 10 ml of blood and place syringe in sharps box.	☐	☐
3. Using 5 ml of normal saline, access the port with sterile technique and gently attempt to flush the saline.	☐	☐
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 5. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.	☐	☐
5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.	☐	☐
6. Record procedure, any complications, and fluids/medications administered in the Patient Care Report (PCR).	☐	☐

Venous Access-Extremity

AEMT

Clinical Indications:

Any patient where intravenous access is indicated (significant trauma or mechanism, emergent or potentially emergent medical condition).

Steps	Was performed ? YES	NO
1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional. (0.9% NaCl and 3 ml volume)	☐	☐
2. Paramedics can use intraosseous access where threat to life exists as provided for in the Venous Access - Intraosseous procedure.	☐	☐
3. Use the largest catheter bore necessary based upon the patient's condition and size of veins.	☐	☐
4. Fluid and setup choice is preferably: • Normal Saline with a macro drip (10 drop[/cc) for trauma, hypovolemia, or medical conditions, and • Normal Saline with a micro drip (60 drop/cc) for medical infusions.	☐	☐
5. Rates are preferably: • Adult: KVO: 60 ml/hr (1 drop/6 sec for a macro drip set) • Pediatric KVO: 30 ml/hr (1 drop/12 sec for a macro drip set)	☐	☐
6. If shock is present: • Adult: 500 ml fluid boluses repeated as long as lungs are dry and BP < 90. - Consider a second IV line • Pediatric: 20 ml/kg boluses repeated PRN for poor perfusion.	☐	☐

General

EMR

EMT

AEMT

Paramedic

Med Control

Vascular Access-Intraosseous

AEMT

Clinical Indications:

Patients where rapid, regular IV access is unavailable with any of the following:

- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure/respiratory arrest.

Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta.
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

Steps	Was performed ? YES	NO
1. Personal protective equipment (gloves, eye protection, etc.).	☐	☐
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient > 12 years of age, identify the anteriormedial aspect of the distal tibia (2 cm proximal to the medial malleolus). If available, may use yellow EZIO needle in the humeral head. Must have attended training session to use the humeral head site	☐	☐
3. Prep the site with alcohol swab.	☐	☐
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.	☐	☐
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle. Aimed away from the nearby joint and epiphyseal plate, power the driver until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.	☐	☐
6. Remove the stylette and place in an approved sharps container.	☐	☐
7. Attach a syringe filled with at least 5 ml NS; aspirate bone marrow for manual devices only, to verify placement: then inject at least 5 ml NS to clear the lumen of the needle.	☐	☐
8. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.	☐	☐
9. Stabilize and secure the needle with dressings and tape.	☐	☐
10. You may administer, through the IO needle, **Adult**: Lidocaine 40 mg (2 mL) over 120 seconds Flush IO catheter with NS 5 – 10 mL **Pediatric**: Lidocaine 0.5 mg/kg over 120 seconds **Maximum 40 mg** Flush IO catheter with NS 2 – 5 mL	☐	☐
11. Following the administration of any IO medications, flush the IO line with 10 ml of IV fluid.	☐	☐
12. Document the procedure, time, and result (success) on/with the Patient Care Report (PCR).	☐	☐

General

EMR

EMT

AEMT

Paramedic

Med Control

Protocol Changes August 19, 2024

ADULT

Respiratory

Allergic Reaction EMT permitted to administer Epinephrine 1 mg/mL IM via syringe for anaphylaxis.

Respiratory Distress Albuterol & DuoNeb changed Scope of Practice to allow EMT to administer

PEDIATRIC

Pediatric Respiratory

Pediatric Allergic Reaction EMT permitted to administer Epinephrine 1 mg/mL IM via syringe for anaphylaxis.

Pediatric Respiratory Distress Albuterol, Ipratropium & DuoNeb changed Scope of Practice to allow EMT to administer

PHARMACOLOGY

Albuterol (Proventil) Changed Scope of Practice to allow EMT to administer

DuoNeb **(Ipratropium/Albuterol)**: Changed Scope of Practice to allow EMT to administer

Glucagon EMT permitted to administer

Ipratropium (Atrovent) Changed Scope of Practice to allow EMT to administer

Sodium Bicarbonate Sodium Bicarbonate: No longer used routinely for Cardiac Arrest. See Special Considerations.

Tranexamic Acid-TXA (Cyklocapron) AEMT permitted to administer.

Protocol Changes Part B

Protocol Changes Part C

Protocol Changes Part D

Protocol Changes Part E

Capnography

Considered the ventilation vital sign

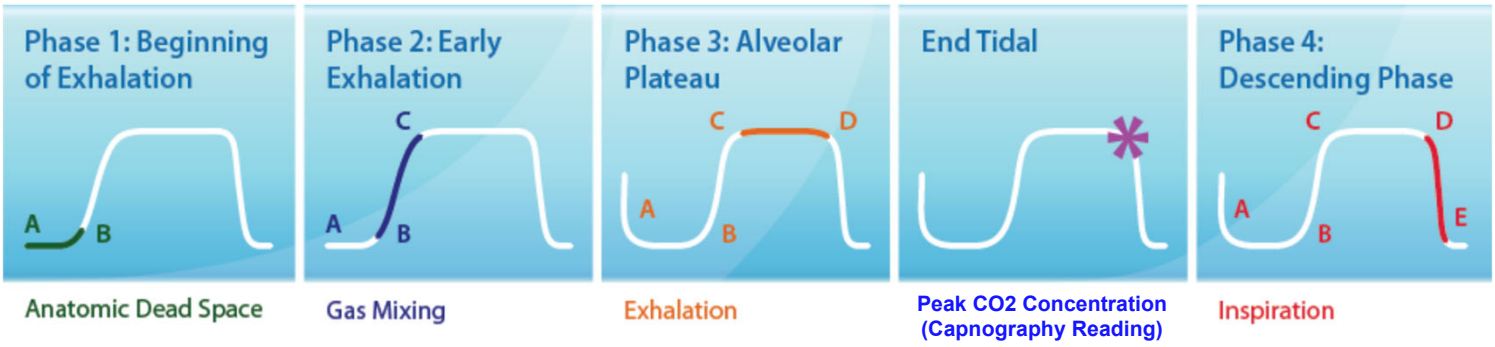
Capnography gives a true accurate picture of ventilation status frequently before patient symptoms are recognized by health care providers.
Gives objective data regarding clinical course of management and treatment
Arterial blood gas CO_2 has a normal range of 35 – 45.
$EtCO_2$ will normally be within 0 – 5 mm of ABG CO_2 value

Prehospital Airway

- *Intubated Patients*
  - Maintains Airway Presence during transport and patient movement
  - Quality of Ventilation
  - Early notification of problems or ROSC
  - Advantages to head trauma patients by maintaining ventilation rates in head injured patients
- *Non Intubated Patients*
  - Assesses ventilation status in patients with respiratory distress
  - Shows bronchodialator effectiveness
  - Indicates patients ventilation rate
  - Diabetics patients
- *The diagnostic element of CO_2 is in the waveform not in the numeric value!!!*

False Positives Possible?
After recent ingestions of a carbon beverages or alcohol, this can give a false positive $EtCO_2$ for 2 – 3 ventilated breaths.
Several ventilations should wash out stomach CO_2 content.
Displacement of ETT against the lateral tracheal wall can cause flat wave

Phases of the Capnogram



Normal Capnography Waveform

Capnography Information

Capnography Uses

Increased ICP - You can use capnography to maintain ventilation rates to obtain $EtCO_2$ at the low end of normal

Use in Ventilation Rates - useful in the prehospital setting to help maintain appropriate manual and mechanical ventilation –
Inadvertent Hyperventilation - Inadvertent hyperventilation is common following paramedic RSI despite EtCO2 monitoring and target parameters.(1)

Cardiac Arrest - Reductions in $EtCO_2$ during CPR are associated with comparable reductions in cardiac output making $EtCO_2$ more reliable than radial pulses. (2)

Return of Spontaneous Circulation - The use of CO_2 is able to be used in the determination of ROSC often the first indicator. Increase occurs due to the excess CO_2 being washed out of the previously hypoperfused tissue.(3)

Use in Death Confirmation - Studies indicate that patients that have been intubated and have a CO_2 less than 10 which does not increase are clinically dead.(4)

ACLS Medication - You will see an initial increase in the $EtCO_2$ after administration of Sodium Bicarbonate. This will come back down after several ventilations. This demonstrates the reason ACLS suggest no $NaHCO_3$ unless adequate ventilation present

Paralytics - You may see a “curare cleft” Caused by the stronger thoracic muscles that are more paralyzed than the weaker diaphragm, This is an indicator that the patient is coming up from medication, Consider further sedation and/or paralyzation.

Pacemaker - Can be used to help determine when a patient has captured during pacing as you will see an increase in CO_2 prior to feeling a pulse. The increase is due to the increase in cardiac output that should accompany capture.

Trauma Patients - Decrease levels when determined to be not from other causes should lead you to suspect hypovolemia as severe shock will have low CO_2 due to poor perfusion. You will see an increase in CO_2 as perfusion status improves during resuscitation.

Nasotracheal Intubation - In NTI capnography can be used to guide the ET tube into proper position
You will see an increase in CO_2 as the tube passes into the hypopharnyx and decrease if you remove it from the hypopharynx and move toward the esophagus.(5)

Diabetic – In DKA patients, Kaussmaul respiration helps correct acidosis. Patients with an $EtCO_2$ of less than 29 were found to be in acidosis 95% of the time, whereas no patients with $EtCO_2$ of 36 or higher were in acidosis.(6)

Seizure Patients - Capnography is a very valuable and reliable assessment tool to assure airway patency in seizure patients or those medicated with Valium, Versed, or Ativan for seizure activity.

- Can be used in actively seizing patients
- Increases in CO_2 are common in the seizure patient due to the exaggerated muscular activity
- Continued increases or very high $EtCO_2$ can indicate hypoventilation, commonly associated with benzodiazepine use.

Pain Management - Patients that are given sedatives or narcotics for pain are at risk for hypoventilation, Capnography can assure continued airway presence during extrication and/or transport with just a glance at the monitor.

Asthma - $EtCO_2$ is specifically good for assessing the severity of asthma or the presence of bronchospasm

- Bronchospasm can give the appearance of a “shark fin” on the waveform.
- Diagnosis of asthma versus panic attack

Patients experiencing bronchoconstriction will develop a shark fin appearance to the waveform. This sharkfin will resolves as the patient responds to treatment. In the event the patient fails treatment the shark fin will not resolve and increases in $EtCO_2$ may be seen as the patient gets tired.

CPAP - You can use the cannula with CPAP as long as you can good get a good seal.
It is a good idea to place it on the patient to monitor respiratory status of your patient during CPAP use. Prevents missing apnea in CPAP patients

Capnography Waveforms

Pulmonary Embolus (PE) - Typical presentation of SOB, tachycardia, risk factors. $EtCO_2$ can present with normal waveform appearance and a lower numeric value due to respiratory rate and decrease perfusion to lungs. **If the PE is small you may see no change**. Small PE may demonstrate no change in $EtCO_2$ values and should not be used as a single assessment tool for assessment of a PE

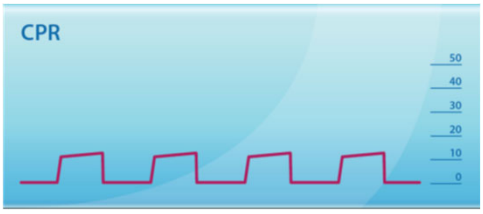
Pregnant Patients - compression of the vena cava restricts blood flow back to the heart and lungs which can cause decreases in $EtCO_2$ due to decrease perfusion.
Note: Shark-fin waveform appearance in pregnant patients can be a normal finding and does not specifically indicate bronchoconstriction.

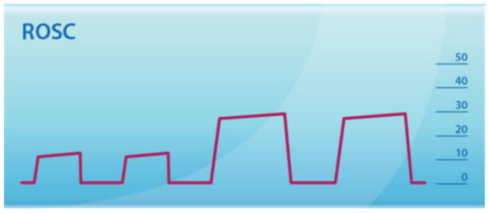
Rescue Airway Device – Rescue Airway Devices - Used to confirm adequate ventilation. without other evidence of bronchoconstriction as this may be a normal finding.

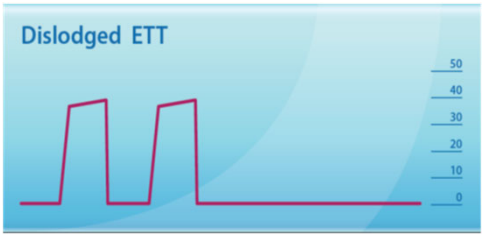
Remember

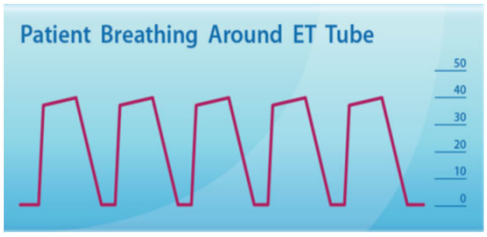
- Capnography assesses ventilation
- It confirms adequate ventilation – not a confirmed secured airway!!!!
- You have to have adequate perfusion
- Changes are immediate long before pulse oximetry
- You need to use it to be comfortable with it

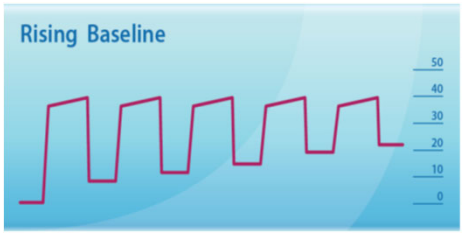
Capnography Wave Forms

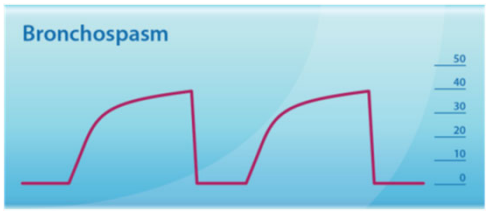


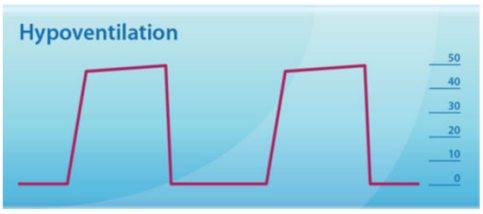


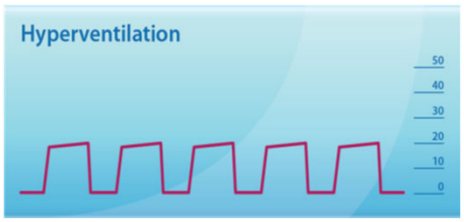












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(2) Weil, M. Cardiac Output and End-Tidal Carbon Dioxide. Critical Care Medicine, November 1985
(3) Singh Amar. Comparing the Ability of Colormetric and Digital Waveform End Tidal Capnography to Verify ET tube placement. Academic Emergency Medicine Vol. 10 No. 5 466-467
(4) Levine R. End-tidal CO_2 and outcome of out-of-hospital cardiac arrest. New England Journal of Medicine. July 997;337:301-306
(5) Phillips 2003
(6) Fearon D., Steele D. End-tidal CO_2 predicts the presence and severity of Acidosis in Children. Academic Emergency Medicine Vol 9 No. 12 1373-1378

MIAMI EMERGENCY NEUROLOGIC DEFICIT (MEND) PREHOSPITAL CHECKLIST

Date: | Name: | Age: | Sex:

BASIC DATA

WITNESS NAME: ★ | WITNESS PHONE: ★

Dispatch time: | EMS arrival time:

Departure to ED time: | ED arrival time:

HISTORY

LAST TIME PATIENT WITHOUT SYMPTOMS ★ DATE: _____ TIME _____

YES	NO	T-PA EXCLUSIONS
☐	☐	Head trauma at onset ★
☐	☐	Seizure (shaking or staring) at onset ★
☐	☐	Taking warfarin (Coumadin)
☐	☐	History of bleeding problems
☐	☐	Possible brain hemorrhage (severe headache, stiff neck, ↓LOC)

ADDITIONAL HISTORY

Symptoms _____

Allergies _____

Medications _____

Past History _____

Last Meal _____

Events Prior _____

MANAGEMENT

☐ Do NOT treat hypertension

☐ Do NOT allow aspiration → Keep NPO, head up, O_2 2-4 L

☐ Do NOT give glucose (unless glucose <50) → IV NS; check fingerstick: _____

☐ ECG rhythm _____ → If AMI, 12-lead time: _____

STROKE-SPECIFIC ED REPORT (see starred items on checklist)

SYMPTOM ONSET	NEUROLOGIC EXAM	WITNESS
★ TIME (last time w/o sxs)	★ Level of consciousness	★ Name
★ Trauma (history)	★ Speech/language	★ Contact info
★ Seizure (staring, shaking)	★ Visual fields	
	★ Moto strength	

EXAMINATION

BP: L _____ / _____ R _____ / _____ Pulse: Rate & Rhythm: _____ Resp _____

MEND EXAM

On scene: Perform LOC & basic exam (Cincinnati Prehospital Stroke Scale in shaded boxes) En route: If time allows, perform the complete MEND exam.

MENTAL STATUS	CHECK IF ABNORMAL: ON SCENE	EN ROUTE
■ Level of Consciousness (AVPU) ★	☐	☐
■ Speech "You can't teach an old dog new tricks." ★ Abnormal = wrong words, slurred speech, no speech	☐	☐
■ Questions (age, month)		☐
■ Commands (close, open eyes)	☐	

CRANIAL NERVES	R	L	R	L
■ Facial Droop (show teeth or smile) Abnormal — one side does not move as well as other	☐	☐	☐	☐
■ Visual Fields (four quadrants) ★			☐	☐
■ Horizontal Gaze (side to side)			☐	☐

LIMBS	R	L	R	L
■ Motor — Arm Drift (close eyes and hold out both arms) ★ Abnormal — arm can't move or drifts down	☐	☐	☐	☐
■ Leg Drift (open eyes and lift each leg separately) ★			☐	☐
■ Sensory — Arm and Leg (close eyes and touch, pinch)			☐	☐
■ Coordination — Arm and Leg (finger to nose, heel to shin)			☐	☐

Facial palsy - weakness on one side of face with smile.	Absent = 0	Mild = 1	Moderate to Severe (little to no facial movement) = 2
Arm motor function - the same test as Cincinnati and Los Angeles scales.	Normal to mild = 0	Moderate (able to lift arm, but unable to hold it for 10 seconds) = 1	Severe (unable to raise arm) = 2
Leg motor function - ask the patient to lift each leg.	Normal to mild (able to lift leg and hold for five seconds) = 0	Moderate (able to lift, but unable to hold for five seconds) = 1	Severe (unable to lift one leg off of bed at all) = 2
Head and gaze deviation - if the patient's head or eyes are towards one side, ask them to look towards the other side.	Absent = 0	Present (unable shift gaze past midline) = 1	
If a right-side deficit is found, check for aphasia (inability to say or hear words correctly). Ask the patient to close their eyes and make a fist.	Performs both tasks correctly = 0	Performs 1 task correctly = 1	Performs neither task = 2
If a left-side deficit is found, check for agnosia (an inability to process sensory information). Touch their arm and ask "whose arm is this?" Then ask them to raise both hands and clap.	Patient recognizes his/her arm = 0	Does not recognize his/her arm or the impairment = 1	Does not recognize his/her arm nor the impairment = 2
A stroke is likely with a score above 1, and ELVO is likely if the cumulative score is above 5.			

Cincinnati Stroke Scale

2. **Cincinnati Stroke Scale**

Facial Droop

- ☐ Normal: Both sides of face move equally
- ☐ Abnormal: One side of face does not move at all

Arm Drift

- ☐ Normal: Both arms move equally or not at all
- ☐ Abnormal: One arm drifts compared to the other (Close eyes and hold out both hands)

Abnormal Speech

- ☐ Normal: Patient uses correct words with no slurring “You can’t teach an old dog new tricks”
- ☐ Abnormal: Slurred or inappropriate words or mute

B E F A S T

BALANCE	EYES	FACE	ARM	SPEECH	TERRIBLE HEADACHE
					
Sudden loss of balance?	Loss of vision in one or both eyes?	Face looks uneven?	Arm or leg weak/ hanging down?	Speech slurred? Trouble speaking or seem confused?	Thunder clap headache? Worst headache of your life?