OhioHealth Emergency Medical Services
Medical Protocols

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Medical Director Statement

The following document presents protocols for the provision of care by the emergency medical care providers of OhioHealth Emergency Medical Services (OHEMS). These protocols shall be used as guidelines in the assessment and management of patients.

These have been written with the understanding that every situation is different; but that certain basic guidelines must be adhered to in order to best standardize the care of our patients. Pre-hospital emergency medicine is an art and not an exact science; these protocols will allow our emergency medical care providers and members of the emergency department to work together for the benefit of our patients.

The medical director has reviewed and approved these protocols for use.

_____________________________
Paul Gabriel, MD, FACEP, FAAEM
Medical Director

State of Ohio
County of Franklin

Before me, a Notary Public, in and for said county, personally appeared the above named
____________________________ who acknowledges signing the foregoing instrument and that the same is a free act and deed.

In Testimony Whereof, I have hereunto affixed my name and official seal at Columbus, Ohio this _____ day of ______________________, 20____.

____________________________
Notary Public

____________________________
Commission Expiration
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ADULT
ROUTINE FOR ALL PATIENTS

General Considerations

1. While this document cannot cover every possible variation of disease or injury encountered in the field, it should provide a foundation for the acute care of the majority of patients seen.
2. Basic Life Support (BLS) measures are considered as standing orders for Advanced Life Support (ALS) providers unless otherwise specifically mentioned.
3. General treatment: All patients shall receive the following general supportive care as appropriate (within the scope of practice and sound clinical judgment of the provider):

Airway Control:

- Positioning/suctioning
- Oropharyngeal or nasopharyngeal airways
- King LTD (or other adopted advanced airway)
- Endotracheal intubation
- Use of pharmacological agents to facilitate airway control
- Use of difficult airway devices, such as the Endotracheal Tube Introducer, to facilitate airway control
- Cricothyrotomy (needle, surgical)

Ventilatory Support:

- Supplemental oxygen by appropriate means
- Bag/valve-mask - bag/valve/ET
- Monitoring of pulse oximetry, Capnography
- Deep tracheal suctioning

Circulatory Support:

- CPR and components of CPR
- Basic bleeding control, up to and including use of tourniquets

Vital Signs:

Obtain and record every 5 minutes if the patient is unstable, 10 minutes if the patient is stable, document vital signs prior to and after administration of medications:

- B/P.
- Pulse -- rate, rhythm, strength.
- Respiration.
- Temperature.
History:

- Assess pain using the 0 – 10 scale.
- Past major illnesses or problems.
- What occurred prior to present complaint?
- Details of present complaint.
- Family history of disease -- especially if heart related.
- Use of medication, medical allergies.
- Pregnancy record (G/P/A)
  1. Gravida - Number of pregnancies
  2. Para – Number of viable births (>20 wks)
  3. Abortus – Number of births that were lost or terminated for any reason
- For pediatric patients:
  1. Weight
  2. Immunization status
  3. Exposure to communicable diseases
  4. Assess pain level using the pediatric pain assessment (Pediatric Pain Schematic in Pediatric section).

General observations of patient:

- Skin Color: Normal, Cyanotic, Pale, and Flushed.
- Moist - Dry.
- Warm - Cool.
- Capillary refill.

Level of Consciousness:

- Best verbal.
- Eyes open.
- Best motor.
- Pupils:
  1. Reactive.
  2. Non-reactive.
  3. Unequal.

Evaluate patient’s general appearance, relevant history of condition and determine:

| O | Onset | S | Signs/Symptoms |
| P | Provokes | A | Allergies |
| Q | Quality | M | Medications |
| R | Radiates | P | Past Medical History |
| S | Severity | L | Last Meal |
| T | Time | E | Events leading to present illness |
|   |   | I | Interventions |
Spinal Immobilization:

- Selective immobilization using cervical collars, KED’s (or similar devices), spine boards (or similar devices), and improvised devices. This includes screening for appropriate immobilization.

Splinting:

- Using pillows, cardboard splints, vacuum splints, traction devices, and other improvised devices as appropriate and available.

Vascular Access:

- Peripheral, Central or Intraosseous access, including the access of pre-established lines, when appropriate.
- IV is defined as Peripheral, Central or Intraosseous Access.

Pharmacological:

- **Oxygen**, as appropriate.
- For nausea consider **Ondansetron (Zofran)**:
  
  **Adult:** 4 mg slow IV, IO or PO, may repeat in 10-15 minutes, max of 8 mg.
  
  **Pediatric:** 0.1 mg/kg IV or IO. Use in children 2 – 12 years, may repeat in 15 – 30 minutes with maximum dose 4 mg. Children older than 12, use adult dosage

ECG/Electrical Therapy:

- Defibrillation/cardioversion/pacing, including AEDs and manual devices.
- ECG and 12 lead monitoring.
- Patients requiring continuous ECG monitoring shall be attended by a paramedic at all times.

Documentation:

- Limit the use of abbreviations as much as possible. Instead, spell out all wording when applicable (examples: units vs. u, milligrams vs. mg, movement of extremities x 4 vs. MOE x 4, Morphine vs. MS or MSO4, etc.).
SEDATION

General Considerations

1. Therapeutic purposes:
   a. Control the patient’s airway/ventilation.
   b. Control Intracranial pressure.
   c. Pain relief.
   d. Control of heat production.
   e. Decrease anxiety and minimized discomfort of procedures.
   f. Control of combative patients.

General – i.e. anxiety and/or combative patients, etc.

- May use Lorazepam (Ativan) 1 mg slow IV or IO, diluted 1:1 with 0.9% Normal Saline, every 5 minutes, to a maximum of 5 mg.
- If systolic BP > 100 mmHg administer 2 – 5 mg Midazolam (Versed) slow IV or IO, may repeat in 5 minutes, maximum 10mg.

Pain Control

- Relieve pain to a point of patient comfort, not to totally relieve or mask pain.
- DO NOT use in patients with multiple trauma, head injury, abdominal injury or suspected spinal injury.
- If BP > 90 mmHg systolic Morphine Sulfate 2 – 5 mg slow IV or IO. May be repeated every 5 minutes for a total of 20 mg if pain persists and systolic BP > 90 mmHg.

Procedural

- For cardioversion, chest decompression, joint and fracture reduction
- Midazolam (Versed) 2 – 5 mg slow IV or IO, may repeat in 5 minutes, maximum 10 mg, or intranasal via MAD (see MAD procedures).

Intubation – Airway Control

- For patients with suspected increased ICP or Asthma, consider Lidocaine (Xylocaine) 100 mg rapid IV.
- If BP is normal to hypertensive – Midazolam (Versed) 2 – 5 mg slow IV or IO, may repeat to maximum of 10 mg.
- May use Etomidate (Amidate) 0.2 mg/kg – 0.3 mg/kg, IV or IO over 2 minutes, may repeat x1 if needed.
CHEST PAIN - CARDIAC

General Considerations

1. Patients experiencing chest pain shall always be transported by medic. Even with a normal ECG. If transportation is refused, make every effort to contact the patient’s physician and obtain signed refusal forms.
2. If arrhythmia is present, follow the appropriate dysrhythmia algorithm.
3. Any patient that has used erectile dysfunction medication in the last 72 hours Nitroglycerine should be avoided or used with extreme caution.

- **Oxygen**, to maintain oxygen saturation ≥ 94%.
- Monitor Vitals, EKG and IV access as per [Routine For All Patients](#).
- Obtain 12 Lead EKG on chest pain or suspected cardiac patient, with 2-3 preferred.
- Give 4 [Baby Aspirin](#) 81 mg PO (Total of 324 mg).
- **Nitroglycerine** for pain, 0.4 mg sublingually. May repeat every 2-5 minutes to a maximum of 3 doses, if systolic BP > 100 mmHg.
- If chest pain is still not relieved, consider [Morphine Sulfate](#) IV in 2 mg increments every 5 minutes until:
  a. Chest pain is relieved or breathing becomes easier.
  b. BP falls to less than 90 mmHg systolic.
  c. BP falls and patient becomes obtunded.
  d. Maximum of 10 mg
- If hypotension occurs, give **Fluid Bolus** of 200 cc [0.9% Normal Saline](#) (may repeat if no signs of pulmonary edema).
BRADYCARDIA

BRADYCARDIA
Heart Rate <60 BPM

Inadequate Perfusion

YES

- Maintain Patient airway; assist breathing as needed
- Give oxygen
- Monitor EKG (identify rhythm), blood pressure, oximetry
- Establish IV access

Observ/Monitor

- Prepare for transcutaneous pacing; use without delay for high-degree block (type II second-degree block or third-degree AV block)

- Consider Atropine Sulfate 0.5 – 1.0 mg IV while awaiting pacer. May repeat to a total dose of 3.0 mg. If ineffective, begin pacing.

- Consider sedation, for pacing.

- Consider Epinephrine (Adrenalin) Drip (2 to 20 mcg/min) or Dopamine (Intropin) Drip (5 to 20 mcg/min) infusion while waiting pacer or if pacing is ineffective.

Patient stability changes

No

- Prepare for transcutaneous pacing
- Treat contributing causes

Reminders

- If pulseless arrest develops, go to Pulseless Arrest Algorithm
- Search for and treat possible contributing factors:
  - Hypovolemia
  - Hypothermia
  - Thrombosis (coronary or pulmonary)
  - Hypoxia
  - Toxins
  - Tamponade, cardiac
  - Hydrogen ion (acidosis)
  - Hypo-/Hyperkalemia
  - Tension pneumothorax
  - Trauma (hypovolemia, increased ICP)
**TACHYCARDIA**

**With Pulse**

- Maintain Patient airway; assist breathing as needed
- Give oxygen
- Monitor EKG (identify rhythm), blood pressure, oximetry
- Identify and treat reversible causes

**Initial Synchronized Cardioversion Dosage**
- Narrow Regular: 50-100 J
- Narrow Irregular: 120-200 J
- Wide Regular: 100 J
- Wide Irregular: Defibrillation Dose (NOT Synchronized)

---

**TACHYCARDIA**

**With Pulse**

- Establish IV Access, if patient is conscious consider sedation, do not delay cardioversion
- If pulseless arrest develops, go to Pulseless Arrest Algorithm
- If possible, transport to Cardiac Care Facility

**Is Patient Stable?**

- **Unstable signs include:**
  - Altered Mental Status
  - Ongoing Chest Pain
  - Hypotension or Signs of Shock
  - Rate-related symptoms (uncommon with HR<150 BPM)

**Perform immediate synchronized cardioversion**

- Establish IV Access, if patient is conscious consider sedation, do not delay cardioversion
- If pulseless arrest develops, go to Pulseless Arrest Algorithm
- If possible, transport to Cardiac Care Facility

**Regular Rhythm**

- **Regular Rhythm**

**Irregular Rhythm**

- **Irregular Rhythm**

---

**Probable atrial fibrillation or atrial flutter**

- Observe/Monitor
- Give support care
- Transport to Cardiac Care Facility

**Possible atrial tachycardia, atrial flutter or junctional tachycardia**

- Observe/Monitor for recurrence
- Treat recurrence with Adenosine (Adenocard)
- Transport to Cardiac Care Facility

---

**During Evaluation**

- Secure, verify airway and vascular access when possible
- Prepare for cardioversion.

**Treat contributing factors:**
- Hypovolemia, Hypoxia, Hydrogen ion (acidosis), Hypo-/Hyperkalemia, Hypothermia, Toxins, Tamponade, cardiac, Tension pneumothorax, Thrombosis (coronary or pulmonary), Trauma (hypovolemia)
**PULSELESS ARREST**

Give 2 minutes CPR
Give Oxygen when available
Attach monitor/Defibrillator when available

**PULSELESS ARREST**

Yes

**Shockable Rhythm?**

Yes

VF/VT

Give 1 Shock
- LP12/LP15 at 200 J
- LP10 at 360 J
- AED: device specific
Resume CPR immediately

No

Asystole/PEA

Resume CPR immediately for 5 cycles
When IV/IO is available give
- Epinephrine (Adrenalin) 1 mg, IV/IO (repeat 3-5 minutes)

No

**Shockable Rhythm?**

Yes

Give 1 Shock
- LP12/LP15 at 300 J or higher dose
- LP10 at 360 J
- AED: device specific
Resume CPR immediately after the shock

When IV/IO is available give
- Epinephrine (Adrenalin) 1 mg, IV/IO (repeat every 3-5 minutes)

No

Give 5 cycles of CPR

Yes

Pulse is Present

Begin Postresuscitation Care

No

Shockable Rhythm?

Yes

Give 5 cycles of CPR

No

Shockable Rhythm?

Yes

Give 5 cycles of CPR

No

Continue CPR until defibrillator is ready
Give 1 Shock
- LP12/LP15 at 360 J or higher dose
- LP10 at 360 J
- AED: device specific
Resume CPR immediately after the shock
Consider Antiarrhythmic; given during CPR
- Lidocaine (Xylocaine) (1 to 1.5 mg/kg first dose, then 0.5 - 0.75 mg/kg, to a maximum of 3.0 mg/kg)

During CPR
- Push hard and fast at a rate of 100 compressions/minute
- Ensure full chest recoil
- Minimize interruptions in chest compressions
- One cycle of CPR: 30 compressions then 2 breaths; 5 cycles equals 2 minutes
- Avoid hyperventilation
- Secure, verify airway and vascular access when possible
- Rotate compressions every 2 minutes with rhythm checks
- Search for and treat possible contributing factors:
  - Hypovolemia
  - Hypoxia
  - Hydrogen ion (acidosis)
  - Hypo-/Hyperkalemia
  - Hypothermia
  - Toxins
  - Tamponade, cardiac
  - Tension pneumothorax
  - Thrombosis (coronary or pulmonary)
  - Trauma (hypovolemia)
INDUCED HYPOTHERMIA AFTER CARDIAC ARREST

General Considerations:

1. Paramedics will initiate these procedures as soon as possible after recognizing the return of pulses in a cardiac arrest patient.

2. Paramedics will induce hypothermia in post cardiac arrest patients who experience ROSC fitting the following Inclusion Criteria:

   a. Patient is ≥ 16 years of age AND
   b. Patient has a non-traumatic etiology of sudden cardiac arrest; AND
   c. Patient has return of spontaneous circulation (ROSC), regardless of blood pressure; AND
   d. Patient remains comatose (GCS < 8 and/or no purposeful response to pain); AND
   e. Patient is intubated (may be intubated post-ROSC) or has a King LT-D in place; AND
   f. Patient is not pregnant; AND
   g. EMS agency is taking patient to a hospital that has the capability to continue post-sudden cardiac arrest therapeutic hypothermia; AND
   h. EMS is without suspicion that patient is experiencing accidental hypothermia with a core temperature at or below 34 degrees Celsius (93.2 degrees Fahrenheit). In this instance, EMS should not start pre-hospital therapeutic hypothermia, nor should they attempt to actively re-warm the patient prior to emergency department evaluation.

Recurrent Loss of Pulse:

In the event that the patient experiences a recurrent cardiac arrest after therapeutic hypothermia has been initiated, there is no need to discontinue cooling. Maintain cooling as cardiac arrest protocols are initiated.

Communication with the Receiving Hospital:

Communicate early with the receiving emergency department that therapeutic hypothermia has been initiated.

Documentation:

Document the following in the Patient Care Report (aka EMS Report):

- That the induced hypothermia protocol was initiated
- The time that the induced hypothermia protocol was initiated
- The amount of cold fluid that was infused
- The time cold packs were applied and to which sites
Management:

The following steps should be taken to induce hypothermia in post cardiac arrest patients who achieve ROSC.

- Ensure patient meets inclusion criteria
- Verify ET tube/King LT-D placement
- Ventilate 10 breaths per minute or maintain capnography reading of 35 – 45 mmHg
- Keep patient uncovered. Undergarments may be left in place for modesty
- Place cold packs if available on patient’s neck, bilateral axilla and groin. Under garments may be left in place
- Rapidly administer up to 2 liters of chilled (34°-39°F) 0.9% Normal Saline via rapid IV infusion into peripheral vein(s). IO administration is acceptable as needed
- Monitor for shivering. If patient is shivering, administer Midazolam (Versed) 2 – 5 mg slow IV or IO, may repeat to 10 mg while maintaining the systolic BP above 100 mmHg
- Induced hypothermia should be induced while enroute to the hospital.
  - Transport should not be delayed for the purpose of cooling
PREMATURE VENTRICULAR CONTRACTIONS – PVC’S

General Considerations:

1. If HR < 60 BPM, refer to the Bradycardia algorhythm
2. Asymptomatic PVC’s do not require specific intervention(s).
3. If PVC’s are clearly symptomatic (i.e. altered mental status, syncope, BP < 90 mmHg, signs of acute MI, etc.) OR occurring in sustained runs of V-Tach, or occurs with R on T phenomenon treat as below.

- **Oxygen**, to maintain oxygen saturation ≥ 94%.
- Monitor Vitals, EKG and IV access as per [Routine For All Patients](#).
- Consider 200 ml fluid bolus of **0.9% Normal Saline**.

- Administer **Lidocaine (Xylocaine)** 1 – 1.5 mg/kg IV bolus. May repeat **Lidocaine (Xylocaine)** bolus at 0.5 to 0.75 mg/kg, up to maximum total bolus dose of 3 mg/kg.
- Following conversion, hang a **Lidocaine (Xylocaine) Drip**: At 2 to 4 mg/min (30 - 60 gtts/min).
ACUTE AIRWAY OBSTRUCTION

Conscious victim sitting or standing:

- If coughing or respirations are present but compromised provide support and assurance.
- If coughing or respirations becomes absent, stridor develops or patient becomes increasingly hypoxic:
  - Give abdominal thrusts or chest compressions (in the case of obese and/or pregnant patients) as per AHA guidelines.
  - Repeat sequence until respirations restored or victim loses consciousness.

Unconscious victim:

- Reposition head and try to ventilate.
- Administer chest compressions per AHA guidelines.
- Finger probe or direct visualization with laryngoscope and removal with Magill forceps if possible.
- Establish airway and reattempt to ventilate.
- If unable to ventilate, repeat above sequence.
- If still unable to ventilate the patient, perform Cricothyroidotomy and attempt to provide positive pressure ventilation with oxygen.
- Oxygen, as appropriate.
- Monitor Vitals, EKG and IV access as per Routine For All Patients.
- Obtain and monitor Capnography as Routine For All Patients.
- Continually repeat sequence until object is removed.
ALTERED LEVEL OF CONSCIOUSNESS

General Considerations:

1. Consider differential diagnosis such as:
   a. Hypoglycemia
   b. Stroke
   c. Traumatic head injury
   d. Chest Pain-Cardiac
   e. Respiratory arrest
   f. Drugs

2. Follow appropriate protocols based on suspected etiology of the decreased LOC.
3. Always C-spine immobilize unconscious patients with an unknown mechanism of injury.

Management:

- **Oxygen**, as appropriate.
- Monitor Vitals, EKG and IV access as per [Routine For All Patients](#).
- Obtain and monitor Capnography as per [Routine For All Patients](#).
- Obtain capillary glucose level. If glucose level < 80 mg/dl, go to [Diabetic](#) Protocol.
- If patient is unconscious, exhibits respiratory depression (or is known narcotic overdose), administer [Naloxone (Narcan)](#), 2 mg IV. (IM, ET, or Intranasal, if unable to establish IV)
AORTIC ANEURYSM / DISSECTION

- **Oxygen**, as appropriate.
- Monitor Vitals, EKG and IV access as per **Routine For All Patients**.
- Establish at least two IVs of **0.9% Normal Saline** using large bore angiocaths.
- Transport to hospital immediately.
- Consider **Morphine Sulfate** IV in 2 mg increments every 5 minutes for pain and/or anxiety:
  - BP is within parameter(s).
  - BP falls to less than 90 mmHg systolic.
  - BP falls and patient becomes obtunded.
  - Maximum of 20 mg.
  - If hypotension occurs, give **Fluid Bolus** of 200 ml – 500 ml **0.9% Normal Saline**.
CEREBRAL VASCULAR ACCIDENT (CVA)  
TRANSIENT ISCHEMIC ATTACK (TIA)

General Considerations:

1. The goal in stroke management is to minimize brain injury and maximize patient recovery.
2. Stroke victims often times deny or rationalize their symptoms.
3. Signs/Symptoms may be subtle.
4. Many other medical emergencies can mimic a stroke (hypo/hyperglycemia, O.D., etc.)
5. Consider transporting a witness to the onset of the signs/symptoms with the patient to the hospital.

Management:

- **Oxygen**, monitor and maintain oxygen saturation ≥ 94%.
- Monitor Vitals, EKG and IV access as per **Routine For All Patients**.
- Obtain and monitor Capnography as per **Routine For All Patients**.
- Perform neurological exam (Cincinnati Pre-Hospital Stroke Scale (CPSS), MENDS).
- Attempt to pinpoint the specific time at which the patient’s symptoms began, and DOCUMENT IT!
- Elevate head of bed 30° if BP is > 100 mmHg systolic.
- IV at a keep-open rate, initiate a large bore IV, if possible.
- If patient is unconscious, exhibits respiratory depression (or is known narcotic overdose), administer **Naloxone (Narcan)**, 2 mg IV. (IM, ET, or Intranasal, if unable to establish IV)
- Obtain glucose level, if < 80 mg/dl then treat as per **Diabetic Protocol**.
- DO NOT TREAT HYPERTENSION IN A CVA SUSPECTED PATIENT.
- Treat Seizure as per **Seizure Protocol**.
- Treat cardiac dysrhythmias with appropriate algorithm.

Cincinnati Pre-Hospital Stroke Scale (CPSS)

Facial Droop (have patient show teeth or smile):

- Normal – both sides of face move equally
- Abnormal – one side of face does not move as well as the other side

Arm Drift (patient closes eyes and holds both arms straight out for 10 seconds):

- Normal – both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful).
- Abnormal – one arm does not move or one arm drifts down compared with the other

Abnormal Speech (have the patient say “you can’t teach an old dog new tricks”):

- Normal – patient uses correct words with no slurring
- Abnormal – patient slurs words, uses the wrong words, or is unable to speak

Interpretation: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%
DIABETIC

General Considerations:

1. Consider “treat-and-refuse” of diabetic patients with a well-documented medical history who have received the treatment outlined below and meet **ALL** of the following criteria:
   a. Blood glucose is now > 80 mg/dl confirmed via glucometer.
   b. Patient agrees to eat a meal, and is able to do so.
   c. Patient will be in the company of a responsible adult(s) who will stay with him/her for at least 12 hours or can ensure that somebody else does.
   d. Patient agrees to contact their primary health care provider within 24 hours.
   e. Patient has the capability of measuring their own blood sugar and adjusting their medications (i.e. insulin) accordingly.
   f. There are no other acute medical issues involved (i.e. suspected stroke, MI, trauma, drugs, alcohol, serious infection etc.).
   g. A SIGNED “REFUSAL” FORM MUST STILL BE OBTAINED
   h. Thoroughly document all of the above criteria on your Patient Care Report (PCR).
   i. If blood glucose is > 400 mg/dl, the above “treat-and-refuse” considerations are **NOT** an option. General refusal protocol shall be followed if patient does not want EMS transportation.

2. Remember that:
   a. Diabetics may experience atypical MI signs/symptoms.
   b. Many signs and symptoms of hypo/hyperglycemia are similar to that of CVA.
DIABETIC (CONT.)

Management:

- **Oxygen**, as appropriate.
- Monitor Vitals, EKG and IV access as per [Routine For All Patients](#).
- Obtain blood glucose level
- If glucose level < 80 mg/dl
  - When confronted with a patient utilizing an Insulin Pump, assist the patient or caretaker d/c insulin pump. *Discontinuing an insulin pump should only be performed by the patient, family member or friend who is familiar with the patient and the insulin pump*. Inform receiving hospital that pump has been discontinued.
  - If the patient is able to swallow and can easily protect their own airway, give [Glucose (Glutose)](#), 15 grams PO.

  OR

- **50% Dextrose** IV, 25 – 50 ml (12.5 – 25 grams), (1/2 – 1 amp), until glucose level > 80 mg/dl, max 100 ml (2 amps).
  - If unable to obtain an IV, give [Glucagon](#) 1 mg IM.

- If glucose level > 240 mg/dl:
  - If no signs of pulmonary edema, give 500 ml [0.9% Normal Saline](#). May repeat to max of 1000 ml.

- If glucose level ≥ 100 mg/dl and the patient is experiencing seizure, go to [Seizure Protocol](#).
HYPERTENSION

General Considerations:

1. If patient is experiencing headache only without any neurological deficits – see Sedation Protocol – Pain Management.
2. If patient is experiencing Chest Pain – see Chest Pain Protocol.
3. If patient is experiencing Pulmonary Edema – see Pulmonary Edema Protocol.
4. If patient is experiencing stroke – see Cerebral Vascular Accident Protocol.
5. If patient is experiencing Aortic Abdominal Aneurysm – see AAA Protocol.

Management:

- **Oxygen**, as appropriate.
- Monitor Vitals, EKG and IV access as per Routine For All Patients.
- Consider Obtaining and monitoring Capnography as per Routine For All Patients.
- Head @ 30° angle
- Provide Support and Comfort
NON-TRAUMATIC SHOCK

General Considerations

1. Defined as Hypotension not due to Trauma or Cardiac:
2. BP < 90 mmHg systolic, Tachycardia, Tachypnea, Pallor, Decreased LOC

Management:

- **Oxygen**, as appropriate.
- Monitor Vitals, EKG and IV access as per **Routine For All Patients**.
- Consider Obtaining and monitoring Capnography as per **Routine For All Patients**.
- Give **0.9% Normal Saline Bolus** 250 – 500 ml, may be repeated x 3, if no signs of pulmonary edema.
- If no change with NS Bolus, **Dopamine (Intropin) Drip** at 5 – 20 mcg/kg/min until BP greater than 100 mmHg systolic.
  
  OR

- If no change with NS Bolus, start **Epinephrine (Adrenalin) Drip** at 2 – 20 mcg/min until BP greater than 100 mmHg systolic.
OVERDOSE/POISONING

General Considerations:

1. In an event where there is a possible toxic exposure / hazmat, report to incident command and stage until patients are decontaminated.
2. Contact Poison Control via one of the following:
   a. 800-MHz radio
   b. Call the National Call Center at 800-222-1222.
   c. Call the Children’s Hospital ECC at 614-228-1323.
3. Note level of consciousness; gag reflex, any unusual odors present.
4. Obtain history:
   a. Medications, or other substance abuse - type, dose, route of administration, time of administration.
   b. Take bottles and/or samples, if appropriate, to the ER.
5. All patients who have attempted suicide shall be transported, by either EMS or Law Enforcement.

Management:

1. General
   - **Oxygen**, as appropriate.
   - Monitor Vitals, EKG and IV access as per Routine For All Patients.
   - Consider Obtaining and monitoring Capnography as per Routine For All Patients
   - If patient is unconscious, exhibits respiratory depression (or is known narcotic overdose), administer Naloxone (Narcan), 2 mg IV. (IM, ET, or Intranasal, if unable to establish IV)
   - May repeat Naloxone (Narcan) administration every 5 min. as necessary to maintain respiratory effort.
   - Treat seizures as per Seizures Protocol
OVERDOSE/POISONING (CONT.)

Organophosphate:

With Bradycardia, severe cramping, profuse bronchial secretion, bronchospams, coma and/or seizures.
- Give Atropine Sulfate 2 mg IV or IM, repeat every 5 minutes until response
- Intubate in signs of diaphragmatic paralysis.

Tricyclic:

Is suspected with widen QRS (>100msec), dysrhythmias or seizure.
- Consider Sodium Bicarbonate 1 mEq/kg, repeat until response

Cocaine, Crystal Meth or Bath Salts:

If known or strongly suspect, overdose and patient is in a tachycardic arrhythmia (including ventricular fibrillation, and ventricular tachycardia).
- May use Lorazepam (Ativan) 1 mg IV slowly, diluted 1:1 with 0.9% Normal Saline, every 5 minutes, to a maximum of 5 mg.
- If systolic BP > 100 mmHg administer 2 – 5 mg Midazolam (Versed) IV slowly, may repeat in 5 minutes, maximum 10 mg.

Cyanide Poisoning:

See Smoke and Cyanide Inhalation protocol below.
OVERDOSE/POISONING (CONT. 2)

Smoke and Cyanide Inhalation:

- Establish an airway via oral endotracheal intubation, if indicated.
- Contact **Poison Control Center** about other possible therapies.
- Radio Columbus Children’s Hospital, ask for Poison Control.
- Phone number **614-228-1323** or **800-222-1222**.

Skin exposure:

Rinse with large amount of **sterile water** or **0.9% Normal Saline**.
- *If Alkali or unknown dry powder*, brush away any dry product. With all powder and metal chips removed, the skin may be flushed with copious amount of fluid (either **Sterile Water** or **0.9% Normal Saline**).
- Be cautious as Alkali will react to water and air.

Respiratory exposure:

Should be placed on 100% **Oxygen**, and/or intubated if ventilations are compromised.

Gastrointestinal exposure:

Is a true emergency
- Protect airway as needed.
RENAL DIALYSIS PATIENTS

Problems:

a) Pulmonary Edema most common
b) Arrhythmia
   i) Ventricular
   ii) Atrial Arrhythmia (flutter fib most common)
   iii) Heart Blocks (occasionally)
c) Hypertensive Crisis
   i) Sudden rise in systolic and diastolic BP, needs immediate therapy by dialysis clinic/hospital
d) Air embolus
   i) Can occur during the dialysis procedure
      - Lay patient on left side
      - Place the patient in Trendelenburg position (body about 30° angle, head down)
e) Hyperkalemia
   i) Wide QRS
   ii) Peak T waves
   iii) Cardiac Dysrhythmias
   iv) Sine waves
      - Administer 50 mEq Sodium Bicarbonate, and 10 ml of Calcium Gluconate 10% (1000 mg).
      - Administer Albuterol (Ventolin) 2.5 mg via nebulizer.
      - If patient is bradycardic or asystolic consider treating hyperkalemia in addition to ACLS protocols.

Cautions:

f) DO NOT take BP on the limb with a shunt or fistula.
   i) SHUNT - is an external access to an artery and vein used to attach to the dialysis machine
      - generally kept covered by an ACE bandage.
   ii) FISTULA - is an internal joining of an artery and vein used to create an access to the dialysis machine.
   iii) Any obstruction of the shunt or fistula may cause it to clot and render it unusable.
g) DO NOT start IV on a limb with a shunt or fistula.
   i) Exception to this would be a life-threatening situation with no other IV sites available.
h) Accidental break or rupture of a shunt or fistula results in rapid, excessive bleeding.
   i) Any blood loss is severe to a dialysis patient because their normal hematocrit (red blood cells) is low.
   ii) Treatment:
      - Oxygen, as appropriate.
      - Monitor Vitals, EKG and IV access as per Routine For All Patients.
      - Consider Obtaining and monitoring Capnography as per Routine For All Patients
RENAL DIALYSIS PATIENTS (CONT.)

Personal Precautions:

i) Hepatitis is common in dialysis patients. It is highly contagious through direct contact with fresh or dried blood. Use strict universal precautions.

Cleaning:

j) Blood on equipment, should be soaked in bleach solution 20 minutes, using rubber gloves.
k) Contaminated clothing should be removed and laundered immediately.
RESPIRATORY DISTRESS
(Allergic Reaction, Asthma, COPD, Pulmonary Edema)

General Considerations:

1. Follow the current BLS and ACLS guidelines to treat any choking victim.
2. Evaluate if airway is or is not patent. If airway needs to be controlled, use any one, or combination of the following:
   a. Head-tilt chin lift.
   b. Jaw thrust.
   c. Oropharyngeal or nasopharyngeal airway.
   d. Secure an Advance Airway. (Utilize Sedation protocol if necessary).
   e. Bag-Valve-Mask with 100% Oxygen.
3. Evaluate and document initial and any changes of lung sounds.
4. Through patient assessment and history, determine the cause of the respiratory distress.

General Treatment:

- Oxygen, as appropriate.
- Monitor Vitals, EKG and IV access as per Routine For All Patients.
- Consider Obtaining and monitoring Capnography as per Routine For All Patients.
ALLERGIC REACTIONS - (INSECT, DRUGS, FOOD)

- **Oxygen**, as appropriate.
- Monitor Vitals, EKG and IV access as per **Routine For All Patients**.
- Consider Obtaining and monitoring Capnography as per **Routine For All Patients**.
- Maintain airway, assist respiration as needed.
- Observe for edema of the face, edema remote from the injury site, severe itching and hives.
  - If none of the above present, treat symptomatically.
  - If any of the above present, administer **Epinephrine (Adrenalin)** (1:1000) IM, 0.3 ml - 0.5 ml (0.3 - 0.5 mg). May repeat in 20 minutes.
- Basic EMT’s – **Epinephrine (Adrenalin) via auto-injector, mid-thigh, held firmly against leg for at least ten seconds**, *(patient assisted)*, as per Ohio Division of EMS Scope of Practice.
- If reaction is associated with dyspnea and wheezing, you may use **Albuterol (Ventolin)**.
  Nebulizer treatment 2.5 mg, may be repeated as needed.
- Administer **Diphenhydramine (Benadryl)** 25 mg IV, or 50 mg IM, may be repeated in 10 minutes.
- **Anaphylaxis - Hypotensive**: BP < 90 mmHg systolic.
  - **IV** **Epinephrine (Adrenalin)** (1:10,000) 0.2 - 0.3 mg. (2 - 3 ml).
  - **IF no IV**, administer **Epinephrine (Adrenalin)** (1:1000) IM, 0.3 ml - 0.5 ml (0.3 - 0.5 mg).
  - If BP remains < 80 mmHg systolic, treat as **non-trauma shock**.

  **NOTE:** If victim has heart disease, administration of Epinephrine (Adrenalin) should be used with caution.
ASTHMA

- **Oxygen**, as appropriate.
- Monitor Vitals, EKG and IV access as per [Routine For All Patients](#).
- Obtain and monitor Capnography as per [Routine For All Patients](#).
- Intubate if necessary.
  - Ventilate at a rate to allow sufficient expiration.
- Administer **Albuterol (Ventolin)** treatment, 2.5 mg. May be repeated as needed.
- Basic EMT’s – **may assist a patient with metered dose inhalers** as per Ohio Division of EMS Scope of Practice.
  
  After 1st **Albuterol (Ventolin)**, Administer **Ipratropium Bromide (Atrovent)** 0.5 mg (2.5 ml) mixed with **Albuterol (Ventolin)** 2.5 mg Nebulized, may repeat as needed.
- If no known heart disease, may administer 0.3 - 0.5 mg **Epinephrine (Adrenalin)** 1:1,000 IM, or consider 0.2 - 0.3 mg **Epinephrine (Adrenalin)** 1:10,000 IV.

**NOTE**: If victim has heart disease, administration of Epinephrine (Adrenalin) should be used with caution.
COPD, BRONCHITIS, EMPHYSEMA

- **Oxygen** at 2-6 LPM nasal cannula or at higher concentrations by mask if severe distress.
- Monitor Vitals, EKG and IV access as per **Routine For All Patients**.
- Obtain and monitor Capnography as per **Routine For All Patients**.
- Administer **Albuterol (Ventolin)** Nebulizer treatment, 2.5 mg. May be repeated as needed.
- Basic EMT’s – **may assist a patient with metered dose inhalers** as per Ohio Division of EMS Scope of Practice
- **Albuterol (Ventolin)** may be given via CPAP at 5 cmH₂O, CPAP oxygen set at 15 LPM.
- After 1st **Albuterol (Ventolin)**, Administer **Ipratropium Bromide (Atrovent)** 0.5 mg (2.5 ml) mixed with **Albuterol (Ventolin)** 2.5 mg Nebulized, may repeat as needed.
- Transport in an upright position.
- Intubate if unconscious, if severe bradycardia follows tachycardia or if patient becomes lethargic or has altered level of consciousness.

*Remember: Most COPD patients are CO₂ retainers and are dependent upon some hypoxia for their respiratory drive. You may increase delivered O₂ as you feel necessary, but remember to watch for respiratory depression.*
ACUTE PULMONARY EDEMA / CHF

Look for and note cyanosis, hypotension, coughing, wheezing, labored breathing, diaphoresis, pitting edema, tachypnea, apprehension, and inability to talk.

- **Oxygen** at 100% NRB, or CPAP 5 to 10 cmH₂O with CPAP oxygen set at 15 LPM
- Monitor Vitals, EKG and IV access as per **Routine For All Patients**.
- Consider Obtaining and monitoring Capnography as per **Routine For All Patients**.
- Cardiac Monitor (12-lead).
- Intubate if needed, suction as needed.
- If systolic pressure > 100mmHg, administer one 0.4 mg **Nitroglycerine Tab** sublingually, may repeat every five (5) minutes to a maximum of three (3) doses.
- Administer **Furosemide (Lasix)**, 40 mg IV over 4-6 minutes if patient is not currently taking a diuretic.
  - Administer **Furosemide (Lasix)**, 80 mg IV over 8-10 minutes if patient is currently taking a diuretic.
- If pulmonary edema is still not relieved, consider **Morphine Sulfate** IV in 2 mg increments every 5 minutes until:
  - Pulmonary edema is relieved or breathing becomes easier.
  - BP falls to less than 90 mmHg systolic.
  - BP falls and patient becomes obtunded.
  - Maximum of 10 mg

- **Dopamine (Intropin) Drip** for BP < 80 mmHg systolic.
  - 5 – 20 mcg/kg/min titrated until BP greater than 100 mmHg systolic.
- Transport with patient in most appropriate position to maximize ventilation.
SEIZURES

General Considerations:

1. The basic rule with seizures is to “protect and support” the patient. If trauma, consider cervical immobilization.
2. Aspiration precautions include:
   a. Suction readily available.
   b. If possible, clear mouth of foreign bodies (food, gum, dentures).

Management:

- Maintain airway.
- **Oxygen** by mask at 10 - 15 LPM or Intubate if necessary
- Monitor Vitals, EKG and IV access as per Routine For All Patients.
- Consider Obtaining and monitoring Capnography as per Routine For All Patients
- Do not try to insert an airway or suction during seizure activity.
- Transport all patients experiencing first time seizure activity.
- Transport patients with known seizure disorders if seizure different than normal or continues longer than 3 - 5 minutes.
- Protect patient from injury and aspiration.
- Obtain glucose level, if glucose level < 80 mg/dl go to Diabetic Protocol.
- If seizure prolonged for 10 - 20 minutes, or 2 or more seizures with no lucid interval between, give:
  - **Lorazepam (Ativan)** 1 - 2 mg IV push slowly over 1 - 2 minutes, Diluted 1:1 with 0.9% Normal Saline. May repeat every 10 minutes to a maximum 10 mg.
  - OR
  - **Midazolam (Versed)** 2 - 5 mg IV push slowly over 1 - 2 minutes, may repeat every 5 minutes to a maximum of 10 mg.

- If unable to obtain IV access in a timely manner give Midazolam (Versed) intra-nasally (see MAD procedures). Do not administer greater than 1 ml per nostril.
SPONTANEOUS PNEUMOTHORAX

General Considerations:

1. Suspect tension pneumothorax with:
   a. Long standing COPD or asthma patients.
   b. On home ventilator, intubated and/or artificially ventilated enroute to hospital.
   c. History of chest trauma.
2. Signs and symptoms of tension pneumothorax:
   a. Decreased or absent breath sounds on the side of the pneumothorax.
   b. Tracheal shift (to side opposite pneumothorax).
   c. Cyanosis.
   d. Severe shortness of breath, and/or agitation.

Management:

- Continually reassess ABC's and keep reassessing and intervening as needed.
- Administer high flow Oxygen
- Monitor Vitals, EKG and IV access as per Routine For All Patients.
- Consider Obtaining and monitoring Capnography as per Routine For All Patients.
- The patient’s status can quickly change into Tension Pneumothorax. Monitor carefully, and if necessary, refer to Tension Pneumothorax protocol.
GENERAL APPROACH

PRIMARY SURVEY

- Airway - with control of C-spine.
  - Immobilization Collar.
  - Cervical Immobilization Device
  - Backboard with straps.
- If C-spine fracture strongly suspected, and intubation necessary:
  - Nasotracheal intubation or oral intubation with in-line traction.
  - Nasotracheal intubation is contraindicated in patient with suspected basilar skull or mid-facial trauma.
  - Consider **Sedation Protocol** for oral intubation.
- If major facial trauma: **CRICOTHYROIDOTOMY**
- Breathing:
  - Ventilation as needed, **Oxygen**.
  - Cover sucking chest wound with non-porous dressing taped on three (3) sides.
  - Suspect tension pneumothorax.
- Circulation:
  - At least 1 large bore IV for shock.
  - Direct pressure to large bleeding sites, or apply pneumatic splints.
- Disability (record GCS):
  - Best Verbal.
  - Best Response.
  - Best Motor.
SECONDARY SURVEY

• CNS:
  • Head:
    • Limit IV fluids if volume expansion not needed (0.9% Normal Saline).
    • Intubate and ventilate (16 - 20 BPM and/or End-tidal CO₂ of 30 - 35) unconscious victim or victim with decreased level of consciousness.
    • Consider Lidocaine (Xylocaine) 100 mg rapid IV or IO with suspected increase ICP.
  • Spine:
    • If spinal cord trauma resulting in paralysis, give supportive treatment.
    • Consider Dopamine (Intropin) Drip 5-20 mcg/kg/min for patient with paralysis, without noted severe blood loss.

• Chest:
  • Check for symmetrical expansion (if flail chest, Intubate).
  • Blood pressure/pulse - both arms.
  • Check breath sounds:
    • Hemothorax.
    • Pneumothorax.
    • Examine neck veins.
      • Distended – consider cardiac tamponade.
    • Limit IV fluids if volume expansion not needed (Over hydration can lead to pulmonary complications).

• Abdomen:
  • Puncture/penetrating trauma.
  • Abdominal distension.
  • Tenderness.
  • Decreased bowel sounds.

• Extremities:
  • Splint fractures.
  • Avulsions/Amputations

NOTE: Morphine Sulfate is strongly discouraged in patient with chest, abdominal or head trauma.
ABDOMINAL TRAUMA

- **Oxygen**, advanced airway as needed
- **IV 0.9% Normal Saline**
- Monitor, Pulse Oximetry
- If evisceration is present, cover viscera with sterile saline dressing. Do not replace exposed viscera.
- Transport to appropriate hospital. Consider air-medical transport when necessary.

**NOTE:** Do not administer sedatives for pain in suspected or confirmed abdominal trauma.
BURNS

- Vital signs, maintain airway, administer Oxygen.
- If patient is unconscious or lethargic, airway obstruction or respiratory distress or severe pulmonary edema
  - Secure airway, intubate or perform cricothyroidotomy.
- Treat for smoke inhalation per Smoke and Cyanide Inhalation Protocol.
- Treat bronchospasm as per Asthma Protocol.
- Treat Hypotension as per Traumatic Shock Protocol.
- IV(s) access, if the extent of the burn is greater than 10% of the total body surface and IV sites are available.
- Assess the depth/extent of burns, dress with sterile, normal saline moistened dressings if less than 10% of the body surface is involved.
- **Apply dry, sterile sheets** if burn area is greater than 10% of the total body surface or 3° involvement.
- Document approximate time of burn.
- Be aware of possible associated injuries.
- Medicate for pain as per Sedation Protocol (prepare for apnea or hypotension).
- Transport to the most appropriate Burn Center

Rule of 9’s
ELECTRICAL BURNS

- IV on all electrical burns - cannot assess depth of wound from surface.
- Monitor, obtain at least one 12 lead EKG.
- Transport all victims with electrical burns and injuries.
- Medicate for pain with as per Sedation Protocol (Prepare for apnea or hypotension).
- Give 500 ml of 0.9% Normal Saline Fluid Bolus
  - Repeat up to 3x if no signs of Pulmonary Edema.
CRUSHING TRAUMA

If patient has been trapped/pinned for longer than 20 - 30 minutes, and/or exhibits signs and symptoms or relevant mechanism of injury to suspect crushing injury.

Prior to extrication:

- Coordinate time of release with rescue personnel.
- Establish at least, 1 large bore IV of 0.9% Normal Saline.
- Administer 1 liter of 0.9% Normal Saline just prior to extrication, then maintain 0.9% Normal Saline @ 500 ml/hr
- Apply cardiac monitor.
  - Obtain monitor tracing prior to and sequentially during further treatment.
  - Contact receiving ED of the patient’s “Crushing Injury”.
  - Anticipate Crushing Syndrome and possible cardiac arrest upon extrication of patient.
- Continue aggressive fluid resuscitation with 0.9% Normal Saline.
- Monitor EKG Closely:
  - Widen QRS complexes – 0.12 seconds or greater.
  - PVC’s.
  - V-Tach/V-fib.
  - Idioventricular rhythms.

NOTE: If patient is in cardiac arrest, treat as TRAUMA ARREST.
DENTAL INJURIES

- Save all avulsed teeth in 0.9% Normal Saline moistened gauze or jar of saline.
EXTREMITY TRAUMA

FRACTURES

- Splint in the most comfortable position, fixation or traction, to maintain or restore pulses and pallor.
- Medicate for pain with as per Sedation Protocol (Prepare for apnea or hypotension).

AVULSIONS / AMPUTATIONS AND NEAR-AMPUTATIONS

- Wrap avulsed part in moistened gauze, and place in a plastic bag. Place that bag into another bag with ice or cold pack to keep the avulsed part cool. Protect the avulsed part to avoid freezing.
- Treat near amputations similarly - wrap near-amputated extremity in 0.9% Normal Saline moistened gauze - then apply cold pack to keep cool.
- Establish IV, 0.9% Normal Saline.
- Medicate for pain with Sedation Protocol
- Give Aspirin PO. (Total of 324 mg).

NOTE: Use Morphine Sulfate with caution when treating patients with possible multiple system trauma or multiple injuries.
HYPERTHERMIA

- Apply 100% Oxygen. Intubate as needed.
- Apply monitor
- Start large bore IV 0.9% Normal Saline at KVO rate
- Place ice packs at neck, axially, groin (6 total).
- Monitor rectal temperature if possible.
- Give fluid 0.9% Normal Saline to maintain a systolic BP > 100mmHg.
- Treat as Non-Traumatic Shock.
- If patient is shivering or in active seizure go to Seizure Protocol.
- Support other problems as necessary.
ENVIRONMENTAL HYPOTHERMIA

- Establish diagnosis of Environmental Hypothermia with rectal temperature, if possible.
- Handle victim gently and with extreme caution.
- **All hypothermia cardiac victims MUST be transported.**
- Warm **Oxygen**, cardiac monitor.
- Establish IV 0.9% **Normal Saline** (warmed if possible).
- **During cardiac arrest, limit defibrillation to 1 time only.**
- Transport while re-warming.
THORACIC TRAUMA
(Sucking Chest Wound, Tension Pneumo, Flail Chest, Pericardial Tamponade, Myocardial Contusion)

- Continually reassess ABC’s and keep reassessing and intervening as needed
- Initiate IV 0.9% Normal Saline, high flow oxygen, pulse oximetry, and monitor. Place advanced airway PRN.
- Control external bleeding.
- If systolic BP > 90 mmHg, consider pain control, with the exception of abdominal trauma per Sedation Protocol.
- Do not remove any impaled foreign objects. Stabilize them and transport.

Open (Sucking) Chest Wound:

- Cover wound with non-porous dressing. Reassess adequacy of ventilation. Monitor closely for development of Tension Pneumothorax

Tension Pneumothorax:

- Expose chest and quickly clean with alcohol or Betadine. Using a 14g or larger angiocath, insert needle on the affected side in the second intercostal space at the mid-clavicular line. Be sure to travel along the top of the 3rd rib to avoid the vasculature along the bottom of the 2nd rib. Push the angiocath into the hub. If the air is under tension, it will exit under pressure, giving the tell-tale “rush of air.” Leave the catheter in place if successful. If no air is obtained, remove it, and inform the receiving facility of the attempt.

Flail Chest:

- Apply hands to temporarily stabilize the flail segment. Apply a bulky dressing and tape it to the chest to brace the chest wall if possible. Reassess adequacy of ventilation.

Suspected Pericardial Tamponade or Myocardial Contusion:

- Anticipate hypotension and dysrhythmias.
- Treat accordingly.
- **Do not delay transport**
TRAUMA ARREST

Signs and symptoms:
- Absence of pulse and respirations resulting from trauma.

Management:
- Establish Airway, provide Oxygen.
- Establish at least 2 large bore IV’s.
- Decompression of the chest bilaterally.
- Fluid challenge with 0.9% Normal Saline.
- Consider treating as Pulseless Arrest Algorithm.
TRAUMATIC SHOCK

General Considerations:

1. Approximate systolic blood pressure (BP):
   a. Carotid = Systolic BP of 60
   b. Femoral = Systolic BP of 70
   c. Radial = Systolic BP of 80
2. Definition:
   a. Systolic BP < 90mmHg or pulse rate >140 BPM
   b. Tachypnea
   c. Tachycardia
   d. Decreased level of conscious
   e. Pallor

Management:

- Start at least 1 large bore IV.
- Give bolus of 0.9% Normal Saline, 20 ml/kg to maintain systolic BP > 90 mmHg, may repeat to maintain BP.
- If penetrating trauma give bolus to maintain systolic BP > 90 mmHg.
- If strong signs of Spinal Shock consider Dopamine (Intropin) Drip 5 – 20 mcg/kg/min to systolic BP > 90 mmHg.
NEONATAL FLOW ALGORITHM

BIRTH

- Term Gestation?
- Amniotic Fluid Clear?
- Breathing or Crying
- Good Muscle Tone?

Yes

Routine Care:
- Provide Warmth
- Clear Airway if Needed
- Dry
- Assess Color

No

Provide Warmth
- Position; Clear Airway (as necessary)*
- Dry, Stimulate, Reposition

Evaluate Respiration, Heart Rate and Color

Breathing, HR >100 & Pink

Observational Care

Breathing, HR >100 But Cyanotic

Provide Positive-Pressure Ventilation*

HR < 60
- Provide Positive-Pressure Ventilation*
- Administer Chest Compression

HR > 60

Effective Ventilation, HR > 100 & Pink

Postresuscitation Care

Persistent Cyanosis

Administer Epinephrine and/or Volume*

Apneic or HR < 100

30 sec

A

30 sec

B

30 sec

C

D

Approximate Time

30 sec

*Endotracheal intubation may be considered at several steps
# APGAR SCORING

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (color)</td>
<td>Blue, pale</td>
<td>cyanotic hands</td>
<td>completely pink and feet, pink body</td>
</tr>
<tr>
<td>Pulse Rate</td>
<td>Absent</td>
<td>&lt; 100 BPM</td>
<td>&gt; 100 BPM</td>
</tr>
<tr>
<td>Grimace (response to suctioning)</td>
<td>no response</td>
<td>grimace or minimal response</td>
<td>cry, cough or avoidance</td>
</tr>
<tr>
<td>Activity (muscle tone)</td>
<td>flaccid, limp</td>
<td>some flexion</td>
<td>well flexed, active</td>
</tr>
<tr>
<td>Respiratory Effort</td>
<td>absent, gasping</td>
<td>weak cry</td>
<td>strong, lusty cry</td>
</tr>
</tbody>
</table>
OB/GYN

- Abdominal Pain:
  - All women of childbearing age with severe lower abdominal pain are presumed to have an ectopic pregnancy that is possibly rupturing and should be transported. IV of 0.9% Normal Saline should be started and Oxygen administered.
  - Vaginal Bleeding - (Transport):
    - Any known pregnant woman (2nd - 3rd trimester) should be transported (possible abruption of placenta or placenta previa) as this is potentially life threatening to both mother and child.
    - Definitions:
      - Abruptio Placenta: continues painful contractions of the uterus that may have associated vaginal bleeding.
      - Placenta Previa: painless vaginal bleeding usually during third trimester.
    - If BP < 90 mmHg, treat for shock:
      - Elevated patient’s hips.
      - Oxygen 100% per NRB.
      - Give initial bolus of 1 - 2 liters 0.9% Normal Saline, repeat if signs of shock continue.
  - If patient is not obviously pregnant, and it is not her normal menses, this could still be life threatening. Patient should be transported with at least 1 large bore peripheral IV. (Possible ruptured ectopic or miscarriage).
  - Any elderly female patient should also be transported. Postmenopausal vaginal bleeding is a high risk for cancer or mistaken rectal bleeding.
- Impending Delivery:
  - If possible, child should be delivered in Emergency Department - or ideally in labor and delivery.
    - If head is crowning:
      - If 1st pregnancy and no scalp of baby is visible or small portion 2 – 3 cm of scalp is visible, mother could probably make it to hospital before delivery. Calm mother and coach her to "pant breath" and not push during contractions.
      - However, if large portion of scalp visible, especially if mom has had multiple children, delivery may be imminent.
OB/GYN (CONT.)

- If delivery progresses pre-hospital:
  - Support perineum with gloved hand and encourage mother to avoid pushing. This will slow delivery and help avoid perineal lacerations.
  - Deliver infant and clear airway with bulb syringe.
  - Warm, dry and stimulate infant **UNLESS** thick meconium is present in amniotic fluid.
  - Maintain body temperature and re-assess respiration and heart rate. If heart rate is less than 100, give supplemental **Oxygen** and bag if necessary.
  - If heart rate is less than 60 BPM or 60 – 80 BPM and not increasing, begin compressions, Intubate and proceed with resuscitation. Monitor mother for bleeding.
  - If thick meconium stained fluid, do not stimulate newborn to breath until Intubated and suctioned for meconium in airway. Leave ET tube during transport.

NOTE: Regardless of age, all known or suspected pregnancies **must** be transported to adult facilities, not Children’s Hospital.
ECLAMPSIA/TOXEMIA

Definition:

- Toxemia: is the presence of any combination of the following after the 20th week of pregnancy.
  - Hypertension: systolic BP > 140 mmHg, Diastolic BP > 90 mmHg or a change in diastolic blood pressure > 15 mmHg from pre-pregnancy pressure.
  - Generalized edema
  - Hyperreflexia
- Eclampsia: is the presence of toxemia plus seizures.

Treatment:

- Oxygen 100% per NRB, intubate if indicated.
- May use Lorazepam (Ativan) 0.5 – 1 mg IV slowly, every 5 minutes, maximum 5 mg.
- May consider Midazolam (Versed) 2–5 mg IV slowly, every 5 minutes, maximum 10 mg.
PRETERM LABOR

- Definition: any active labor less than 36 weeks of pregnancy.
- **Oxygen** 100% per NRB
- IV 0.9% Normal Saline with a rate of 200 – 500 ml/hr.
PEDIATRIC
PEDIATRIC INFORMATION:

1. During calculations of pediatric weight based medications, the maximum amount calculated shall not exceed the normal adult dosage for the selected medication.

2. Age definitions are:
   a. **Newborn**: ≤ 28 days old
   b. **Infant**: 29 days to 1 year old

3. If patient is < 10 years old, go to Pediatric Protocol
4. Regardless of age, special needs patients may fall within Pediatric Protocol
5. Keep in mind that pediatric treatment will be based on weight

### NORMAL PEDIATRIC VITAL SIGNS

<table>
<thead>
<tr>
<th>Age</th>
<th>Pulse</th>
<th>Respiration</th>
<th>Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>120-140</td>
<td>30-40</td>
<td>70-80 Systolic</td>
</tr>
<tr>
<td>1-5</td>
<td>100-120</td>
<td>20-30</td>
<td>Systolic = 80+2 x Age</td>
</tr>
<tr>
<td>6-10</td>
<td>80-100</td>
<td>12-20</td>
<td>Diastolic = 2/3 Systolic</td>
</tr>
<tr>
<td>&gt;10</td>
<td>As Adult Normal</td>
<td>As Adult Normal</td>
<td>As Adult Normal</td>
</tr>
</tbody>
</table>
PEDIATRIC
GENERAL
INFORMATION
CONSIDERATIONS FOR CHILDREN REQUIRING EVALUATION & TRANSPORT

The number of encounters dealing with children is much less than with adults.

With the rapidly growing population of special needs children and the variety of possible special treatments, you are encouraged to consult the Medical Control Physicians (MCP) at the receiving hospital to assist with treatment and management decisions. The Medical Control Physicians are always available by telephone or radio and are always glad to help should you have any questions about treatment interventions.

The following protocols address, differing skill levels, situations where field action(s) can directly affect a child's survival. The protocols are designed to guide the pre-hospital provider through the ABC's, highlighting key strategies for the pediatric patient. **At no point should a transport be delayed due to the inability to provide a specific intervention.**

**When possible, transport a parent or guardian with the pediatric patient.**
AIRWAY

Establish airway (with cervical spine immobilization if unconscious or any indication of a head, facial or cervical spine injury) and ventilation. When establishing an airway, remember the differences between the adult and pediatric airway. The young child has a disproportionately large tongue, which can easily occlude the airway. A small amount of blood or vomit can also obstruct the airway. Deciduous, or "baby teeth", are poorly anchored and easily dislodged.

a) An oral airway may be helpful for the unconscious child. It should never be used on a conscious child as it can precipitate vomiting. Extreme care must be taken when inserting an oral airway. It is recommended that an oral airway be inserted by the direct method with a tongue blade using it to assist in placement. "Rotating" the airway in place can traumatize mucous membranes, induce bleeding, and further obstruct the airway.

b) The following general considerations should be taken when performing advance airway support such as endotracheal intubation:

- The technique should be performed by the most experienced person and not exceed 15-20 seconds. Cardiac monitoring should be instituted.
- Oral intubation is preferred over nasal intubation.
- In children under 8 years of age an uncuffed tube is currently used; a cuffed tube may also be used. The cuff should not be inflated unless discussed with MCP. Studies suggest endotracheal tube size, is best determined by using a length-based resuscitation tape, for example, the Broselow Tape. (Research has shown that length-based tapes may not be as accurate in obese children and larger equipment may be needed than predicted by the tape)
- Endotracheal tube placement should be confirmed by: direct visualization of tube entering vocal cords, the presence of bilateral breath sounds, bilateral chest excursion, vapor in endotracheal tube, and use of an end-tidal carbon dioxide detection. Monitor end-tidal readings to assure endotracheal tube placement through care.
- Patients < 9 years old nasotracheal intubation is absolutely contraindicated.
- Patients < 12 years old nasotracheal intubation is relatively contraindicated.
Assess respiratory status. In children, respiratory distress is manifested by agitation, increased pulse rate and respiratory rate (remember age-dependent vital signs*), use of accessory muscles (retractions), nasal flaring, and possibly grunting. Late respiratory distress is manifested by a slow pulse and respiratory rate and cyanosis (the presence of cyanosis is dependent on the hemoglobin level).

a. If oxygen is indicated and the child has a patent airway and good respiratory effort, administer oxygen at the highest concentration possible - via a non-rebreather mask at 10-15 LPM. Do not hesitate to administer oxygen to the pediatric patient.

b. If the child requires ventilatory assistance, administer 100% oxygen via bag-valve-mask. It is strongly recommended that there are several sizes of clear pediatric masks available, and a pediatric and adult positive pressure ventilation bag. The neonatal size ventilation bag is not recommended equipment for field use.

c. When possible, monitor oxygen saturation with continuous pulse oximetry and document findings every 5-10 minutes.
CIRCULATION

Assess circulatory status.

**EARLY** signs and symptoms of shock in children include a rapid heart and respiratory rate (again, remember age-dependent vital signs), agitation, and poor peripheral perfusion (capillary refill > 2 seconds).

Hypotension is a **LATE** and ominous finding. Document vital signs, (including temperature and blood pressure, if appropriate) and peripheral perfusion.

At the advanced or paramedic level, an intravenous line may be indicated. Once initiated, the fluid volume should be carefully monitored, via an infusion pump, mini-drip, or in-line volume chamber if possible, to minimize inadvertent fluid overload. Children in shock, however, may require rapid administration of, preferably, warm 0.9% **Normal Saline**.

A pediatric bolus is **20 ml/kg** administered as rapidly as possible. The patient should be reassessed following the bolus and if there is still tachycardia and poor perfusion, a second bolus initiated. Medical control should be contacted if a second bolus is needed.
DEFICIT: NEUROLOGIC EVALUATION

General Considerations:

- Assess neurologic status
- When assessing neurological status, the fontanel should be assessed when age appropriate
- Carefully evaluate for the presence of increased intracranial pressure (ICP). In the infant, increased ICP may be manifested by a full or bulging anterior fontanel, a weak, shrill or irritable cry, and poor muscle tone.
- Pupillary responses, level of consciousness, recognition of parents, and **Glasgow Coma Score (GCS)** should also be documented.

**Pediatric Glasgow Coma Scoring**

<table>
<thead>
<tr>
<th></th>
<th>Glasgow</th>
<th>Infant</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Opening</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>Spontaneous</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>To Voice</td>
<td>To Voice</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>To Pain</td>
<td>To Pain</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Verbal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oriented</td>
<td>Coos, Babbles</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Confused</td>
<td>Irritable cry, Inconsolable</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate</td>
<td>Inappropriate</td>
<td>Cry/Screaming</td>
<td>3</td>
</tr>
<tr>
<td>Garble Speech</td>
<td>Moans to Pain</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Motor Response</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obeys Commands</td>
<td>Normal Movements</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Localizes Pain</td>
<td>Withdraws to Touch</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Withdraws to Pain</td>
<td>Withdraws to Pain</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Flexion</td>
<td>Flexion</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Extension</td>
<td>Extension</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
EXPOSURE & EVALUATION

All transported children should have repeat vital signs and neuro evaluation every 15 - 30 minutes if the child is stable or every 5 minutes if unstable.

Minimize heat loss. Infants are particularly vulnerable to "cold-stress". Always wrap the child up after the evaluation and use warm blankets and warm IV fluids when possible.

The following information may be helpful while obtaining the history:

   a. Immunization status
   b. Height
   c. Weight
   d. Birth weight if less than one year of age

Encourage the parent's participation in their child's care. Keep the parent and child together whenever possible.

Be honest with the patient and parents during your assessment and treatment.
## RESPIRATORY DISTRESS: LOWER AIRWAY CHART

<table>
<thead>
<tr>
<th>Site of obstruction:</th>
<th>Reactive Airway Disease</th>
<th>Bronchiolitis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bronchospasm or narrowing of the small airways</td>
<td>Inflammatory infection of the small airways</td>
</tr>
<tr>
<td>Etiology:</td>
<td>Varies</td>
<td>Viral infection (RSV), most often in winter and spring.</td>
</tr>
<tr>
<td>Age range:</td>
<td>Varies</td>
<td>Usually less than 2 years.</td>
</tr>
<tr>
<td>Clinical appearance:</td>
<td>EARLY</td>
<td>EARLY</td>
</tr>
<tr>
<td></td>
<td>Expiratory wheezing, uncontrolled cough, tachypnea, tachycardia, alert but anxious, pale, using accessory muscles (retractions, nasal flaring), (O_2) sat &lt; 90%</td>
<td>Same as reactive airway plus nasal congestion, history of recent respiratory infection</td>
</tr>
<tr>
<td></td>
<td>LATE</td>
<td>LATE</td>
</tr>
<tr>
<td></td>
<td>Minimal air movement, unable to cry or talk, ventilatory failure, obtunded, bradycardia, cyanotic, apnea spells, oxygen saturation &lt; 90%</td>
<td>Same as reactive airway disease</td>
</tr>
</tbody>
</table>
# RESPIRATORY DISTRESS: UPPER AIRWAY DISORDERS CHART

<table>
<thead>
<tr>
<th></th>
<th>Epiglottitis</th>
<th>Croup</th>
<th>Foreign Body</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site of Obstruction:</strong></td>
<td>Above vocal cords</td>
<td>Below vocal cords</td>
<td>Varies</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>Bacterial infection (very uncommon because of advances with immunizations)</td>
<td>Viral infection</td>
<td>Varies</td>
</tr>
<tr>
<td><strong>Age Range:</strong></td>
<td>Generally older child (&gt; 2yrs) but can occur younger and in adults</td>
<td>Younger Child (6 months-3 years)</td>
<td>Any (usually under 5 years)</td>
</tr>
<tr>
<td><strong>Onset:</strong></td>
<td>Sudden (6-24 hours), fever may be first sign</td>
<td>Usually mild URI symptoms and then the child develops a barky cough and stridor at night</td>
<td>Sudden if upper airway</td>
</tr>
<tr>
<td><strong>Toxicity:</strong></td>
<td>Child appears very ill; often has high fever</td>
<td>Mild to moderate, low-grade fever</td>
<td>Not ill appearing, no fever</td>
</tr>
<tr>
<td><strong>Drooling:</strong></td>
<td>Common</td>
<td>Infrequent</td>
<td>May be present</td>
</tr>
<tr>
<td><strong>Cough:</strong></td>
<td>Rare</td>
<td>Common, distinctive, &quot;barky&quot; or &quot;seal-like&quot;</td>
<td>Common, history choking, gagging</td>
</tr>
</tbody>
</table>
SEDATION

General Considerations:

1. Therapeutic purposes:
   a. Control the patient’s airway/ventilation
   b. Control Intracranial pressure
   c. Pain relief
   d. Control of heat production
   e. Decrease anxiety and minimized discomfort of procedures
   f. Control of combative patients

Pain Control:

- Relieve pain to a point of patient comfort, not to totally relieve or mask pain
- **Use pain control with caution** in patients with multiple trauma, head injury, abdominal injury or suspected spinal injury
- Monitor respiratory status and adequate perfusion
- **Morphine Sulfate** 0.1 mg/kg IV over 2 - 5 minutes, maximum dose 2 mg, may repeat x 5, every 5-10 minutes

Procedural:

- For cardioversion, chest decompression, joint and fracture reduction
- **Morphine Sulfate** 0.1 mg/kg IV over 2 - 5 minutes, maximum dose 2 mg, may repeat x 5, every 5-10 minutes
- **Midazolam (Versed)** 0.1 mg/kg IV over 2 - 5 minutes, maximum dose 1 mg, may repeat x 5, every 5 - 10 minutes, or intranasal via MAD (see MAD procedures)

Intubation – Airway Control

- **Midazolam (Versed)** 0.05 - 0.15mg/kg, given slow IV or IO, may repeat once in 5 minutes
- **Lidocaine (Xylocaine)** 1 mg/kg, give IV or IO, rapidly, if increased ICP is suspected
PEDIATRIC CARDIAC
PEDIATRIC CARDIAC ARREST

General Considerations:

1. Remember that pediatric arrests are generally due to respiratory issues or shock and do not usually result from a primary cardiac cause.
2. AED’s should not be used for infants (< 1 y/o).
3. AED’s programmed for pediatrics are for children 1 to 8 years of age (about 55 lbs).
4. Pediatric AED’s should not be used on children older than 8 years of age due to inappropriate energy levels being delivered.
5. Manual defibrillation should be 2 joules/kg for the initial shock, then 4 joules/kg for additional shocks (see appropriate algorithm).
6. The preferred method for medication administration during cardiac arrest is either IV or IO.
7. ET drug administration may be used if an IV or IO cannot be established. Ideal ET drug dosages are unknown. If utilizing the ET route, follow the ET drug administration with a 5 ml saline flush and 5 ventilations.
8. ** Lidocaine (Xylocaine), Epinephrine (Adrenalin), Atropin Sulfate, Naloxone (Narcan) (LEAN) ** may be given via the ET tube.
9. During calculations of pediatric weight based medications, the maximum amount calculated shall not exceed the normal adult dosage for the selected medication.
10. If an intubated patient deteriorates, consider the following possibilities (DOPE):
   a. Displacement of the tube from trachea
   b. Obstruction of the tube
   c. Pneumothorax
   d. Equipment failure

- Immobilize cervical spine if indicated
- Assist ventilation with bag-valve-mask while administering 100% oxygen.
  - Intubate when time permits
- Initiate an IV of 0.9% Normal Saline, if possible
  - If IV access unsuccessful, establish intraosseous infusion
- Obtain glucose
  - If glucose < 60mg/dl,
    - If > 8 yrs old, follow adult protocol
    - If 1 and < 8 yrs old, administer 4 ml/kg of 10% Dextrose
    - If < 1 yrs old, administer 2 ml/kg of 10% Dextrose
- Place on cardiac monitor
- Guidelines for rhythm management as per following algorithms:

**DO NOT delay transport for intubation and/or IV attempts**
Mixing D10:

Add ½ Amp of Dextrose (12.5 grams) to 100 ml 0.9% Normal Saline.
PEDIATRIC BASIC LIFE SUPPORT

No movement or response
Send someone to Phone 911

Lone Rescuer: For SUDDEN COLLAPSE,
PHONE 911, Get AED

Open AIRWAY, check BREATHING

If not breathing, give 2 BREATHS that make chest rise

If no response, check pulse:
Do you DEFINITELY feel pulse within 10 seconds?

Definite Pulse

Give 1 breath every 3 seconds
Recheck pulse every 2 minutes

One Rescuer: Give cycles of 30 COMPRESSIONS and 2 BREATHS
Push hard and fast (100/min) and release completely
Minimize interruptions in compressions

Two Rescuer: Give cycles of 15 COMPRESSIONS and 2 BREATHS

If not already done, PHONE 911 for child get AED/defibrillator

Infant (<1 year): Continue CPR until ALS responders take over or victim starts to move
Child (>1 year): Continue CPR; use AED/defibrillator after 5 cycles of CPR
(Use AED as soon as it is available for sudden, witness collapse)

Child >1 year:
Check rhythm
Shockable rhythm?

Shockable

Give 1 Shock
Resume CPR immediately
for 5 cycles

Not Shockable

Resume CPR Immediately
For 5 cycles
Check rhythm every 5 cycles; continue until ALS
providers take over or victim starts to move
PEDIATRIC BRADYCARDIA ALGORITHM

BRADYCARDIA - With a Pulse
Causing cardiopulmonary compromise

- Support ABCs as needed
- Give Oxygen
- Attach monitor/defibrillator blood pressure, oximetry
- Establish IV Access, IO as needed

Bradycardia, causing cardiorespiratory compromise?

- Support ABCs; give oxygen
- Observe
- Consider expert consultation

Perform CPR if despite oxygenation and ventilation HR < 60/min with poor perfusion

- Give Epinephrine (Adrenalin)
  1. IV/IO: 0.01 mg/kg (1:10 000: 0.1 ml/kg)
  2. Endotracheal tube: 0.1 mg/kg (1:1000: 0.1 mL/kg)
  Repeat every 3 to 5 minutes
- If increased vagal tone or primary AV block:
  Give Atropine Sulfate, first dose 0.02 mg/kg, may repeat. (Minimum dose: 0.1 mg; maximum total dose for child: 1 mg.)
- Consider cardiac pacing

Persistent symptomatic bradycardia

- Give Epinephrine (Adrenalin)
  1. IV/IO: 0.01 mg/kg (1:10 000: 0.1 ml/kg)
  2. Endotracheal tube: 0.1 mg/kg (1:1000: 0.1 mL/kg)
  Repeat every 3 to 5 minutes
- If increased vagal tone or primary AV block:
  Give Atropine Sulfate, first dose 0.02 mg/kg, may repeat. (Minimum dose: 0.1 mg; maximum total dose for child: 1 mg.)
- Consider cardiac pacing

If pulseless arrest develops, go to Pulseless Arrest Algorithm

Reminders

- During CPR, push hard and fast (100/min)
- Ensure full chest recoil.
- Minimize interruptions in chest compressions.
- Search for and treat possible contributing factors:
  - Hypovolemia
  - Hypoxia
  - Hydrogen ion (acidosis)
  - Hypo-/Hyperkalemia
  - Hypoglycemia
  - Toxins
  - Tamponade, cardiac
  - Tension pneumothorax
  - Thrombosis (coronary or pulmonary)
  - Trauma
PEDIATRIC PULSELESS ARREST ALGORITHM

1. PULSELESS ARREST
   - BLS Algorithm, give CPR (2-4 minutes)
   - Give oxygen when available, intubate
   - Attach monitor/defibrillator when available

2. Check rhythm
   - Shockable rhythm?
     - Give 1 Shock
       - Manual: 2 J/kg
       - AED: >1 year of age
         Use pediatric system if available for 1 to 8 years of age
       - Resume CPR immediately

3. Shockable
   - Give 5 cycles of CPR*

4. VF/VT
   - Check rhythm
     - Shockable rhythm?
       - Give 5 cycles of CPR*

5. Not Shockable
   - Give 1 Shock
     - Manual: 4 J/kg
     - AED: >1 year of age
   - Resume CPR immediately

6. Continue CPR while defibrillator is charging
   - Give 1 Shock
     - Manual: 4 J/kg
     - AED: >1 year of age
   - Resume CPR immediately after shock

7. Check rhythm
   - Shockable rhythm?
     - Check rhythm
       - If Asystole, go to Box 10
       - If Electrical activity, check pulse. If no pulse go to Box 10
       - If pulse present, begin post-resuscitation care
     - Give 5 cycles of CPR*

8. Continue CPR while defibrillator is charging
   - Give 1 Shock
     - Manual: 4 J/kg
     - AED: >1 year of age
   - Resume CPR immediately after shock
     - Consider antiarrhythmics: give during CPR (before or after shock)
       - Lidocaine (Xylocaine) 1 mg/kg IV/IO push, every 3 to 5 minutes to a maximum 3 mg/kg
   - After 5 cycles of CPR*, go to Box 5 above

9. Asystole/PEA
   - Resume CPR immediately
     - Give Epinephrine (Adrenalin)
       - IV/IO: 0.01 mg/kg (1:10 000: 0.1 ml/kg)
       - Endotracheal tube: 0.1 mg/kg (1:1000: 0.1 mL/kg)
       - Repeat every 3 to 5 minutes

10. Give 5 cycles of CPR*

11. Check rhythm
    - Shockable rhythm?
      - Give 5 cycles of CPR*

12. If Asystole, go to Box 10
    - If Electrical activity, check pulse. If no pulse go to Box 10
    - If pulse present, begin post-resuscitation care

13. Go to Box 4

During CPR
- Push hard and fast (100/min)
- Ensure full chest recoil
- Minimize interruptions in chest compressions
- One cycle of CPR: 15 compressions then 2 breaths; 5 cycles = 1 to 2 min
- Avoid hyperventilation
- Secure airway and confirm placement
- *After an advanced airway is place rescuers no longer deliver “cycles” of CPR continuous chest compressions without pauses for breaths. Give 8 to 10 breaths/minute. Check rhythm every 2 minutes.
- Rotate compressor every 2 minutes with rhythm checks
- Search for and treat possible contributing factors:
  - Hypovolemia
  - Hypoxia
  - Hydrogen ion (acidosis)
  - Hypo-/Hyperkalemia
  - Hypoglycemia
  - Toxins
  - Tamponade, cardiac
  - Tension pneumothorax
  - Thrombosis (coronary or pulmonary)
  - Trauma
TACHYCARDIA WITH PULSE AND POOR PERFUSION

**TACHYCARDIA With Pulses and Poor Perfusion**
- Assess and support ABCs as needed
- Give Oxygen
- Attach monitor/defibrillator

**System Persist**

- Evaluate rhythm with 12-lead ECG or monitor
- Evaluate QRS duration
- Possible Ventricular Tachycardia
  - Narrow QRS (≤0.08 sec)
  - Probable Sinus Tachycardia
    - Compatible history consistent with known cause
    - P waves present/normal
    - Variable RR; Constant RR
    - Infants: rate usually < 200 bpm
    - Children: rate usually < 180 bpm
  - Wide (≥ 0.12 sec)
    - Probable Supraventricular Tachycardia
      - Compatible history (vague, nonspecific)
      - P waves absent/abnormal
      - HR not variable
      - History of abrupt rate changes
      - Infants: rate usually ≥ 200 bpm
      - Children: rate usually ≥ 180 bpm

- Consider vagal maneuvers (No delays)
- Search for and treat cause
- If IV access readily available:
  - May attempt Adenosine (Adenocard) 0.1 mg/kg (maximum first dose 6 mg), may double first dose and give once (maximum of 12 mg) by rapid bolus, if it does not delay electrical cardioversion
  - Synchronized cardioversion: 0.5 to 1 J/kg; if not effective, increase to 2 J/kg. Sedate if possible but don’t delay cardioversion
  - May attempt Adenosine (Adenocard) 0.1 mg/kg (maximum first dose 6 mg), may double first dose and give once (maximum of 12 mg) by rapid bolus, if it does not delay electrical cardioversion

**Probable Sinus Tachycardia**
- Compatible history consistent with known cause
- P waves present/normal
- Variable RR; Constant RR
- Infants: rate usually < 200 bpm
- Children: rate usually < 180 bpm

**Probable Supraventricular Tachycardia**
- Compatible history (vague, nonspecific)
- P waves absent/abnormal
- HR not variable
- History of abrupt rate changes
- Infants: rate usually ≥ 200 bpm
- Children: rate usually ≥ 180 bpm

- Expert consultation advised

**During Evaluation**
- Secure, verify airway and vascular access when possible
- Consider expert consultation
- Prepare for cardioversion

**Treat possible contributing factors:**
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/Hyperkalemia
- Hypoglycemia
- Toxins
- Tamponade, cardiac
- Tension pneumothorax
- Thrombosis (coronary or pulmonary)
- Trauma
PEDIATRIC MEDICAL
ALTERED LEVEL OF CONSCIOUSNESS

(Coma, Syncope, Unconsciousness)

- **Airway, Breathing, Circulation** per Protocol. Establish C-spine control as per [Multiple Trauma Protocol](#) if cause of unconsciousness is unknown.
- Place on cardiac monitor.
- Consider all possible causes of unconsciousness in infants and children.
  - Hypoxia, anoxia
  - Meningitis
  - Head Trauma
  - Subdural hematoma
  - Poisoning or Overdose
  - Hypovolemia
  - Seizure Activity
  - Carbon monoxide poisoning
  - Hypo/Hyperglycemia
- If coma score < 8, assist respiration with bag-valve-mask and 100% oxygen.
  - Ventilate at rate normal for age.
  - Establish airway with oral endotracheal intubation if indicated.
- Establish IV of **0.9% Normal Saline** to run at keep-open rate.
- If signs or symptoms of [hypovolemic shock](#), Administer Bolus 20 ml/kg and reassess.
- Consider administration of [Naloxone (Narcan)](#) at 0.1 mg/kg IV, IO or ET to a maximum dose of 2 mg
- Treat hypoglycemia
  - If glucose < 60mg/dl,
    - If > 8 yrs old, follow adult protocol
    - If 1 and < 8 yrs old, administer 4 ml/kg of **10% Dextrose**
    - If < 1 yrs old, administer 2 ml/kg of **10% Dextrose**

**Mixing D10:**

Add ½ Amp of Dextrose (12.5 grams) to 100 ml 0.9% Normal Saline.
ALLERGIC REACTIONS/ANAPHYLAXIS

(Insect, Drugs, Food)

- Observe for respiratory distress.
- Maintain airway, assist respiration as needed.
- Administer Oxygen, IV(s) access.
- Monitor pulse oximetry every 5 - 10 minutes, consider capnography.
- Observe for edema of the face, edema remote from the injury site, severe itching and hives.
- If none of the above present, treat symptomatically.
- If any of the above present:
  - administer Epinephrine (Adrenalin) (1:1000) IM, 0.01 mg/kg to a maximum of 0.3 mg IM
  - Basic EMT’s – Epinephrine (Adrenalin) via auto-injector, mid-thigh, held firmly against leg for at least ten seconds as per Ohio Division of EMS Scope of Practice
  - If reaction is associated with dyspnea and wheezing, you may use Albuterol (Ventolin) Nebulizer treatment 2.5 mg, may be repeated as needed.
  - Administer Diphenhydramine (Benadryl), 1 mg/kg up to 25 mg IV or IM, may be repeated in 10 minutes.

Anaphylaxis:

If patient is hypotensive

- <70 mm Hg in children aged 1-12 months
- <70 mm Hg + (2X age in years) in children aged 1-10 years
- <90 mm Hg in children ≥10 years of age

Fluid bolus 20 ml/kg 0.9% Normal Saline, reassess and if still tachycardic, poor perfusion or BP low for age repeat fluid bolus of 20 ml/kg.

- Epinephrine (Adrenalin) (1:1000) 0.01 mg/kg to a maximum of 0.3 mg IM may be given every 20 minutes up to three doses
- If BP remains < 70 mmHg systolic, treat as non-traumatic shock.
- Diphenhydramine (Benadryl) 1 mg/kg to a maximum 25 mg IV, IO.
FEVER, TEMPERATURE INSTABILITY

Airway, Breathing, Circulation.

- If signs or symptoms of hypovolemic shock or respiratory failure are present, administer 100% oxygen via non-rebreather mask and support respirations with bag-valve-mask if needed.
- If indicated, establish airway with oral endotracheal intubation.

Obtain history:

- Feeding
- Past Medical History (Sickle cell disease, chemotherapy or splenectomy make the child more likely to have a serious infection)
- Degree of temperature
- Medications or therapies administered
- Immunizations.
- If possible, obtain a rectal temperature on children < 6 months of age.
  - Contraindications to a rectal temperature include rectal bleeding, abdominal distention, an uncooperative child, history of bleeding disorders or any medical problem that places the child at risk for serious infection, i.e. cancer or chemotherapy.
- If > 6 months of age, axillary temperature acceptable. Specify which route in documentation.
- If febrile, remove excess clothing, but take great care to avoid shivering. Consider environment temperature of vehicle.
  - DO NOT sponge child in field.
  - If temperature is >100°F give Acetaminophen (Tylenol) 10 – 15 mg/kg/dose, PO, max 2.6 grams/24 hr
- If signs/symptoms of hypovolemic shock are present, establish an IV of 0.9%Normal Saline and initiate 20 ml/kg fluid bolus.
  - DO NOT delay transport to establish venous access.
  - Check for hypoglycemia
- Transport all infants < 6 months of age with a rectal temperature > 100.4 degrees F. or if < 96 degrees F.
- If patient is immunocompromised (i.e. sickle cell, asplenia, cancer, etc.), a special needs patient, or on any immunosuppressant therapy, patient must be transported with any fever.
HYPOGLYCEMIA

General Considerations

1. Consider “treat-and-refuse” of diabetic patients with a well-documented medical history who have received the treatment outlined below and meet ALL of the following criteria:
   a. Blood glucose is now > 80 mg/dl confirmed via glucometer.
   b. Guardian agrees to have the patient eat a meal, and is able to do so.
   c. Patient will be in the company of a guardian who will stay with him/her for at least 12 hours or can ensure that somebody else does.
   d. Guardian agrees to contact the patient’s primary health care provider within 24 hours.
   e. Guardian has the capability of measuring the patient’s blood sugar and adjusting their medications (i.e. insulin) accordingly.
   f. There are no other acute medical issues involved (i.e. suspected stroke, MI, trauma, drugs, alcohol, serious infection etc.).
   g. A SIGNED “REFUSAL” FORM MUST STILL BE OBTAINED
   h. Thoroughly document all of the above criteria on your Patient Care Report (PCR).

Management:

- Airway, Breathing, Circulation
- Oxygen
- IV at keep-open rate
- Monitor and pulse oximetry.
- Obtain glucose level
- Initiate an IV of 0.9% Normal Saline, if possible.
  - If IV access unsuccessful, consider establishing intraosseous infusion.
  - If glucose < 60 mg/dl
    - When confronted with a patient utilizing an Insulin Pump, assist the patient or caretaker d/c insulin pump. Discontinuing an insulin pump should only be performed by the patient, family member or guardian who is familiar with the patient and the insulin pump. Inform receiving hospital that pump has been discontinued.
    - If > 8 yrs of age, treat as per the adult protocol.
    - If between 1 and < 8 yrs old, administer 4 ml/kg of 10% Dextrose.
    - If < 1 yrs old, administer 2 ml/kg of 10% Dextrose.

Mixing D10:

Add ½ Amp of Dextrose (12.5 grams) to 100 ml 0.9% Normal Saline.

- If glucose > 100 mg/dl and patient having seizure, go to Seizure Protocol.
HYPOVOLEMIC SHOCK: BLOOD LOSS OR DEHYDRATION

General Considerations:

1. Dehydration can be classified as follows:
   a. **Mild (5%)** - tachycardia, decreased tears, dry mucous membranes, decreased urine output
   b. **Moderate (10%)** - all of the above plus poor skin tone, sunken fontanel, sunken eyes, ashen
   c. **Severe (15%)** - all of the above plus hypotension and marked decreased level of consciousness

2. Early signs of hypovolemia in children include the following:
   a. Tachycardia
   b. Tachypnea
   c. Agitation, restlessness
   d. Poor peripheral perfusion (capillary refill > 2 seconds, mottled cool skin)

3. Hypotension is a late and ominous sign
   - Obtain history. If vomiting, diarrhea, or fever present, assess for hypovolemic shock secondary to dehydration.

Management:

- **Airway, Breathing, Circulation.** Establish and maintain cervical spine control if indicated as per Multiple Trauma Protocol.
  - If signs/symptoms of hypovolemic shock present, administer oxygen via a non-rebreather mask.
  - If child has markedly decreased level of consciousness, establish airway via oral endotracheal intubation and ventilate.
  - If signs/symptoms of hypovolemic shock are present, establish venous access of **0.9% Normal Saline.**
  - Administer 20 ml/kg fluid bolus as quickly as possible
  - **DO NOT** delay transport to establish venous access.
  - Obtain glucose level or accucheck, if possible.
  - If blood glucose < 60:
    - If > 8 yrs of age, treat as per the adult protocol.
    - If 1 and < 8 yrs old, administer 4 ml/kg of **10% Dextrose.**
    - If < 1 yrs old, administer 2 ml/kg of **10% Dextrose.**
  - Reassess pulse rate and peripheral perfusion (capillary refill time).
  - If patient remains symptomatic (tachycardic, poor perfusion, etc.) repeat fluid bolus and contact receiving hospital

Mixing D10:

Add ½ Amp of Dextrose (12.5 grams) to 100 ml 0.9% Normal Saline.
OVERDOSE/POISONING

General Considerations:

1. In an event where there is a possible toxic exposure / hazmat, report to incident command and stage until patients are decontaminated.

   Contact Poison Control via one of the following:
   a. Call the National Call Center at 800-222-1222.
   b. Call the Children’s Hospital ECC at 614-228-1323.

2. Note level of consciousness; gag reflex, any unusual odors present.

3. Obtain history:
   c. Medications, or other substance abuse - type, dose, route of administration, time of administration.
   d. Take bottles and/or samples, if appropriate, to the ER.

4. **All patients who have attempted suicide shall be transported.**

Management:

1. General
   - Administer **Oxygen**.
   - IV(s) access, support BP, transport.
   - Monitor, BP and pulse oximeter every 5 - 10 minutes.
   - If patient is unconscious, exhibits respiratory depression (or is known narcotic overdose), administer **Naloxone (Narcan)**, at 0.1 mg/kg IV, IO or ET to a maximum dose of 2 mg (IM, or Intranasal, if unable to establish IV)
   - Check glucose in any child as instructed by Poison Center or any child with agitation or an altered mental status
   - Intubate if necessary.
   - May repeat **Naloxone (Narcan)** administration every 5 minutes as necessary to maintain respiratory effort.
   - Treat seizures as per **Seizures Protocol**
OVERDOSE/POISONING (CONT.)

Organophosphate:

Patient with bradycardia, severe cramping, profuse bronchial secretion, bronchospasm, coma and/or seizures.

- Give Atropine Sulfate 0.05 mg/kg IV or IM for kids with a minimum dose of 0.1 mg to prevent reflex bradycardia. Atropine Sulfate may be redosed every 5-10 minutes. Severe poisonings often require hundreds of milligrams of Atropine Sulfate.
- Intubate for any signs of respiratory failure.

Tricyclic:

Is suspected with widen QRS (>100msec), dysrhythmias or seizure.

- consider Sodium Bicarbonate 4.2 %, 1 mEq/kg, contact MCP if no response

Cocaine or Crystal Meth:

If suspected treat dysrhythmias with appropriate ECC algorithm

Cyanide Poisoning:

See Smoke and Cyanide Inhalation protocol below.

Smoke and Cyanide Inhalation:

- Establish an airway via oral endotracheal intubation as indicated.
- Contact Poison Control Center about other possible therapies.
- Phone number 614-228-1323 or 800-222-1222.
OVERDOSE/POISONING (CONT. 2)

Skin exposure:

Rinse with large amount of **sterile water** or **0.9% Normal Saline**.
- If **Alkali or unknown dry powder**, brush away any dry product. With all powder and metal chips removed, the skin may be flushed with copious amount of fluid.
- Be cautious Alkali will react to water and air.

Respiratory exposure:

Should be placed 100% oxygen, and/or intubated if ventilations are compromised.

Gastrointestinal exposure:

Is a true emergency
- Protect airway as needed.
RESPIRATORY DISTRESS: LOWER AIRWAY (WHEEZING)

General Considerations:

- Carefully obtain history and non-invasive respiratory assessment.
  - Wheezing indicates bronchial constriction and may be present with:
    - reactive airway disease (for example, asthma)
    - foreign body obstructions
    - anaphylaxis
    - viral infections
    - Congestive heart failure.

Management:

- Place child in position of comfort, encourage parent to hold child upright, keep child and parent CALM.
- Administer 100% supplemental oxygen via non-rebreather mask in least threatening manner.
- If respiratory effort insufficient or markedly decreased level of consciousness, support respirations with bag-valve-mask ventilation as needed taking care to avoid gastric distention.
- Administer Albuterol (Ventolin) (2.5 mg) aerosol with supplemental oxygen over 10 - 15 minutes.
- If patient was given an Albuterol (Ventolin) treatment within previous 30 minutes, prior to arrival, begin with Albuterol/Atrovent mix as below:
  - Administer Ipratropium Bromide (Atrovent) 0.5 mg (2.5 ml) mixed with Albuterol (Ventolin) 2.5 mg Nebulized, May repeat as needed.
  - Observe and document child's response. If no improvement, notify receiving hospital’s Medical Control Physician prior to aerosol
  - DO NOT attempt invasive airway unless child has respiratory arrest.
  - DO NOT attempt to establish IV access unless patient shows evidence of respiratory failure, anaphylaxis, asthma or child in arrest.
RESPIRATORY DISTRESS: UPPER AIRWAY DISORDERS (STRIDOR)

General Considerations:

- Carefully obtain history and non-invasive respiratory assessment.  
  - The presence of stridor indicates an upper airway obstruction. 
  - Allow the child to assume a position of comfort.  
  - The child may assume the tripod position.

Management:

- Encourage parent to hold the child upright.  
- Keep child and parent CALM. DO NOT agitate child.  
- Have parent assist with the administration of supplemental oxygen.  
- Use the highest percentage possible.  
- If the child’s respiratory effort is insufficient or there is a decreased level of consciousness, support ventilation with BVM as needed taking care to avoid gastric distention.  
  - DO NOT attempt invasive airway unless child has respiratory arrest.  
- DO NOT attempt to establish IV, unless child is in arrest.  
- If the cause of upper airway obstruction is unknown a normal saline aerosol may be administered.  
- Always transport patients after treatment.
SEIZURES

General Considerations:

1. Consider all possible causes of seizure activity in infants and children
   a. **Metabolic:**
      i. Hypoxia
      ii. Hyponatremia
      iii. **Hypoglycemia**
      iv. Poisoning or overdose
   b. **Infectious:**
      i. Meningitis
      ii. Encephalitis
   c. **Structural:**
      i. Subdural hematoma
      ii. Hydrocephalus
      iii. Shunt dysfunction
   d. **Febrile:**
      i. Sudden increase in body temp

2. **TRANSPORT ALL FIRST TIME SEIZURES AND ANY ATYPICAL, PROLONGED OR INCREASING FREQUENCY OF SEIZURES IN KNOWN SEIZURE PATIENTS (DON’T TRANSPORT ONLY PATIENTS THAT REFUSE TRANSPORT).**

Management:

- **Airway, Breathing, Circulation.** Establish C-spine control as per **Multiple Trauma Protocol** if cause of seizure activity is unknown.
- Support airway as appropriate
  - Assist ventilation as indicated (the majority of seizures stop within 5 minutes and intubation is usually NOT needed)
  - Establish airway via oral endotracheal intubation if indicated
- Place on cardiac monitor
- Place child in left lateral recumbent position and protect from further injury.
- Establish IV of **0.9% Normal Saline** to run at keep-open rate.
- Draw blood glucose and obtain accucheck
- If accucheck is < 60 administer
  - If > 8 yrs of age, treat as per the adult protocol.
  - If between 1 and < 8 yrs old, administer 4 ml/kg of **10% Dextrose**.
  - If < 1yrs old, administer 2 ml/kg of **10% Dextrose**
- Consider administration of **Naloxone (Narcan)** at 0.1 mg/kg IV, IO or ET to a maximum dose of 2 mg.
- Consider administration of **Lorazepam (Ativan)** 0.05 mg/kg IV, IO or deep IM slowly, Diluted 1:1 with **0.9% Normal Saline**, every 5 minutes, maximum 2.5 mg.
- **Midazolam (Versed)** 0.1 mg/kg IV over 2 - 5 minutes, maximum dose 1 mg, may repeat x 5, every 5 - 10 minutes, or intranasal via **MAD** (see MAD procedures)
- Anticipate respiratory depression.

Mixing D10: Add ½ Amp of Dextrose (12.5 grams) to 100 ml 0.9% Normal Saline.
PEDIATRIC TRAUMA
### Pediatric Coma Scoring

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### Normal Pediatric Vital Signs

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<th>Age</th>
<th>Pulse</th>
<th>Respiration</th>
<th>Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>120-140</td>
<td>30-40</td>
<td>70-80 Systolic</td>
</tr>
<tr>
<td>1-5</td>
<td>100-120</td>
<td>20-30</td>
<td>Systolic = 80+2 x Age</td>
</tr>
<tr>
<td>6-10</td>
<td>80-100</td>
<td>12-20</td>
<td>Diastolic = 2/3 Systolic</td>
</tr>
<tr>
<td>&gt;10</td>
<td>As Adult Normal</td>
<td>As Adult Normal</td>
<td>As Adult Normal</td>
</tr>
</tbody>
</table>
ABDOMINAL TRAUMA

- **Airway, Breathing, Circulation** per Protocol. If evidence of a head injury, establish and maintain cervical spine control as per [Multiple Trauma Protocol](#).
- Administer oxygen via non-rebreather mask.
  - Consider oral endotracheal intubation, if any signs of respiratory compromise.
- If signs/symptoms of hypovolemic shock are present initiate an IV of **0.9% Normal Saline** and administer 20 ml/kg fluid bolus as per [Multiple Trauma Protocol](#).
- Do not remove any impaled foreign object.
  - Stabilize object for transport.
- For evisceration:
  - Cover exposed viscera with sterile saline dressing.
  - Do not attempt to replace exposed viscera.
- Assess and manage possible pelvic fracture.
AVULSION OR AMPUTATION

- **Airway, Breathing, Circulation** per Protocol. If evidence of a head injury, establish and maintain cervical spine control as per **Multiple Trauma Protocol**.
- Assess injured extremity for:
  - Color
  - Pulses
  - Sensation
  - Movement
  - Temperature
  - Bleeding
- To control bleeding:
  - Apply pressure with moist gauze pads and elevate extremity (the vast majority of bleeding will stop with direct pressure).
    - If bleeding does not stop with pressure
      - Apply pressure to arterial pressure points.
      - Place a blood pressure cuff on the proximal portion of the extremity and initiate to just above the systolic pressure.
  - If signs/symptoms of hypovolemic shock are present or need for pain control initiate an IV of **0.9% Normal Saline**.
    - For shock, administer 20 ml/kg **fluid bolus** as per **Multiple Trauma Protocol**.
    - For Pain Control, consider **Morphine Sulfate** 0.1 mg/kg to max dose 2 mg may repeat times 5, every 5 - 10 minutes.

If complete amputation:

- Remove gross contamination and wrap amputated part in wet sterile dressing, moistened with **Normal Saline**.
- Place the wrapped, amputated tissue in a plastic bag and place the bag on ice, taking care to avoid direct contact between the ice and the tissue.

Partial amputation:

- Cover with a wet sterile dressing, moistened with **0.9% Normal Saline** solution, and immobilized in alignment with the extremity.
BURNS

- **Airway, Breathing, Circulation** per Protocol I. Establish and maintain cervical spine control if indicated as per **Multiple Trauma Protocol**.
  - If the child has a deceased level of consciousness, signs of respiratory distress or airway compromise, establish an airway via oral endotracheal intubation.
- Stop the burning process:
- Remove burned clothing and jewelry unless adherent to skin.
- Carefully observe for other injuries.
- Estimate the percentage of body surface area (BSA) burned.
  - The child’s palm size equals approximately 1% BSA for irregular or splash pattern burns.
  - If burn > than 10% BSA, cover with sterile **DRY** dressing or sheet. Keep warm.
- If signs/symptoms of shock present or burn area > 20%, initiate IV of **Normal Saline** and administer fluid bolus as per **Multiple Trauma Protocol**.
- If child unstable and venous access not successful, consider initiating an intraosseous infusion as per the **Intraosseous Protocol**
  - If closed-space fire and child unconscious, consider **Smoke Inhalation Protocol**.
  - For pain control, consider **Morphine Sulfate** 0.1 mg/kg to max dose 2 mg may repeat times 5, every 5 - 10 minutes.
- The following are considered **MAJOR** Burns.
  - These children should be transported directly to a Pediatric Burn Center when possible:
    - Burns complicated by other injuries
    - Electrical burns
    - Burns involving face, airway, hands, feet or perineum
    - Inhalation injuries
    - Burns > than 10% full thickness or 20% partial thickness
Rule of 9's
CHEST TRAUMA

- **Airway, Breathing, Circulation** per Protocol. If evidence of a head injury, establish and maintain cervical spine control as per [Multiple Trauma Protocol](#).
  - Administer oxygen via non-rebreather mask.
  - Consider oral endotracheal intubation, if any signs of respiratory compromise.
  - If signs/symptoms of hypovolemic shock are present, initiate IV of 0.9% Normal Saline and administer fluid bolus as per [Multiple Trauma Protocol](#).
- **Do not** remove any implanted or foreign object, stabilize object for transport.
- **Carefully assess for and treat a life-threatening thoracic injury:**
  - Tension pneumothorax:
  - Severe respiratory distress, hypotension, tachycardia, decreased level of consciousness (LOC), cyanosis, absent breath sounds on affected side, distended external jugular veins.

**Tension Pneumothorax:**

- Decompress chest on the involved side with a 16 - 18 gauge over-the-needle catheter. Needle decompression should be at the second intercostal space (over the top of the third rib) at the mid-clavicular line.

**Massive Hemothorax:**

- Profound hypovolemic shock decreased LOC, pallor, flat external jugular veins, respiratory distress.

**Flail Segment:**

- Severe respiratory distress, unequal chest movement, cyanosis, decreased LOC.

**Open Pneumothorax:**

- Respiratory distress, “sucking sound” open wound.
- Consider Asherman Chest Seal
EXTREMITY FRACTURES, DISLOCATIONS

- **Airway, Breathing, Circulation** per Protocol. If evidence of a head injury, establish and maintain cervical spine control as per **Multiple Trauma Protocol**.
- If signs/symptoms of hypovolemic shock are present or need for pain control initiate an IV of **0.9% Normal Saline**.
- For shock, administer 20 ml/kg **fluid bolus** as per **Multiple Trauma Protocol**.
- Control bleeding by direct pressure.
  - For open fractures control bleeding with direct pressure and cover with dry sterile dressing
- Assess extremity distal to the injury for color, pulses, sensation and movement.
- Apply appropriate splint or immobilization device. The following are suggestions:
  - Long bone fracture:
    - Board splint, vacuum splint, air splint.
  - Femur fracture:
    - Traction splint (Hare, Sager), long board splint
  - Pelvic fracture:
    - Stabilize with Back Board or similar device.
  - Shoulder, humerus, clavicle:
    - Sling and swathe
  - Supracondylar humeral fracture:
    - Carefully immobilize as found
- Re-assess color, pulses, sensation and movement after splinting and during transport.
  - For Pain Control, consider **Morphine Sulfate** 0.1 mg/kg to max dose 2 mg may repeat times 5, every 5 - 10 minutes.

HEAD TRAUMA

- Establish and maintain cervical spine control with infant/pediatric collar and immobilization device.
- Immobilize entire spine.
- Consider possibility of head and cervical spine trauma for **ALL** unconscious infants and children.
  - If coma score < 8 or decreases by more than 2 points:
    - Assist ventilation with bag-valve-mask and 100% oxygen.
    - Ventilate at rate normal for age.
    - Consider oral intubation.
    - Consider **Sedation** protocol.
    - Establish at least one IV line of **0.9% Normal Saline**.
- Assess for and treat other life-threating injuries as per the **Multiple Trauma Protocol**.
- If signs/symptoms of hypovolemia are present, administer **20 ml/kg bolus of 0.9% Normal Saline IV** as per **Multiple Trauma Protocol**.
MULTIPLE TRAUMA

- **Airway, Breathing, Circulation** per Protocol, and consider sedation.
- Establish cervical spine immobilization with infant or pediatric collar and immobilization device.
- If coma score < 8 assist ventilation with bag-valve-mask (BVM) with 100% oxygen and ventilate at normal rate for age.
  - Consider oral intubation if coma score < 8 or otherwise indicated.
- Assess for life-threatening thoracic injury and treat as per **Chest Trauma Protocol**. If absent breath sounds, severe respiratory distress, cyanosis, and/or severely altered vital signs at present, assist ventilation via BVM with 100% oxygen.
- Assess for **hypovolemic shock**. If signs/symptoms of shock present, consider:
  - Controlling external bleeding with direct pressure, especially scalp lacerations.
  - Establish an IV of **0.9% Normal Saline**. Administer 20 ml/kg **fluid bolus** as quickly as possible. Re-assess pulse rate and peripheral perfusion (capillary refill). If improvement noted, maintain IV at a keep-open rate (10 - 15 ml/hour).
  - Consider establishing intraosseous infusion if child is unstable and IV access is not obtainable.
  - If no improvement after fluid bolus, repeat bolus and notify receiving hospital.
- Place on cardiac monitor.
- Assess for extremity injuries. If a fracture is present, immobilize limb and treat as per **Extremity Fracture Protocol**.
- Obtain history. Document mechanism of injury and time of injury. Ideally, transport child to Level I Pediatric Trauma facility if possible.

**Remember, signs of hypovolemic shock are subtle and include the following:**

- tachycardia
- tachypnea
- restlessness
- poor peripheral perfusion
- hypotension is a **LATE** and ominous sign.
SUSPECTED CHILD ABUSE

- **Airway, Breathing, Circulation** per Protocol. Establish and maintain cervical spine control if indicated as per [Multiple Trauma protocol](#).
  - If indicated, establish airway via oral endotracheal intubation.
  - If signs/symptoms of hypovolemic shock present, initiate IV of 0.9% **Normal Saline** and administer **fluid bolus** as per [Multiple Trauma Protocol](#).
- Carefully identify and treat any injured areas (abdominal trauma, chest trauma, extremity trauma; see appropriate protocol)
- Special Considerations and Precautions:
  - Extricate child from scene as soon as possible. Avoid pressing for detailed history of the event.
  - **Law enforcement** should be summoned (if not already present) to the scene if parents (or other caregiver) refuse transport after EMT deems it necessary.
  - Report and carefully document **ALL** suspected cases of child abuse. Documentation should include history as given, size, shape, color, degree of healing, and location of each injury.
  - Identify individual county resources for child protective service. Transport the child directly to Nationwide Children's Hospital when possible.

**Child abuse should be suspected when any of the following exist:**

- History is inconsistent with the extent of injury or developmental age.
- The injury reflects an outline of an object or mode of infliction.
- There is a delay in seeking medical attention.
- There are other unexplained injuries in various stages of healing.
- The explanation seems vague or confused.
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CRICOTHYROIDOTOMY

Indication for use:

- Unsuccessful endotracheal intubation.
- Severe facial trauma, particularly unstable mandibular fracture.
- Severe laryngeal trauma.
- Obstructing tumors.
- Burns of the face, and upper airway, precluding intubation.
- Pharyngeal hematomas - usually secondary to cervical spine injury.
- Impacted foreign bodies.
- Strongly suspected cervical fractures.

Technique:

- Consider sedation.
- Palpate the hyoid, thyroid notch, cricothyroid interval and sternal notch.
- If time permits, prep area with Betadine.
- Stabilize the thyroid cartilage make transverse or vertical incision through the skin approx. 2.5cm (1in) over the lower half of the cricothyroid membrane.
- Carefully incise through the membrane.
- Insert scalpel handle or Hemostat into the incision to open the airway.
- Insert the endotracheal tube (#5 to 7) through the opening approximately 6-10mm in a caudal direction.
- Inflate the cuff, and ventilate.
- End-tidal detection system should be used.

Contraindication:

- Children 10 years old and under, **Needle Cricothyroidotomy** should be performed.
DEFIBRILLATOR AND ELECTRICAL SAFETY

- To avoid harm to the patient, electrical energy should be prescribed with full knowledge of the reliability of the equipment and the amount of electrical energy being applied.
- There is a wide variation among defibrillator between the energy stored as indicated on the dial and that, which is delivered. It is preferable to use a defibrillator, which indicates both stored and delivered energy.
- All units should be tested regularly through a 50-ohm resistance to determine the actual energy delivered, and the test should be prominently displayed on the machine.
- Defibrillator to be used in the care of infants and children should be tested at low as well as usual energy levels.
- All defibrillator should be checked periodically using the standards as published by the Inter-Society Commission for Heart Disease Resources.
- This check should specifically address itself to the integrity of all cables, the appropriate grounding of the equipment and the accuracy of the stored versus delivered energy.
- The electrodes should not be charged until just prior to their actual use.
- When a patient is to be defibrillated, all other electrical monitors, unless specified safe for use in defibrillation, must be disconnected, and for the safety of the operators, no contact should be made with the patient or the bed.
EXTERNAL PACER INDICATIONS
(See Bradycardia Algorithms)

- Symptomatic Brady arrhythmia’s not responsive to 3 mg Atropine Sulfate.
- HR < 60 in patients with hypotension (BP < 80mmHg systolic).
- HR < 60 and decreased level of consciousness.
- HR < 60 and patient is experiencing severe chest pain in setting of acute MI.

PROCEDURE:

- Place Pads
  - Anterior - Posterior preferred, as per Pacer Patches directions.
  - Posterior - under left scapula.
- Amperage
  - Non-arrested (but compromised) Bradycardia gradually increase from 40 mA until capture is obtained.
- Rate – 80 - 100 BPM
  - Check for pulse
  - If no pulse, keep pacer function and follow PEA algorithm.
**EZ-IO**

**INDICATIONS:**

EZ-IO (45mm needle, 25 mm needle, 15 mm needle)

1. Intravenous fluids or medications are needed and a peripheral IV cannot be established in 2 attempts or 90 seconds **AND** the patient exhibits one or more of the following:
   a. An altered mental status (GCS of 8 or less)
   b. Respiratory compromise (SpO2 80% after appropriate oxygen therapy, respiratory rate < 10 or > 40 min)
   c. Hemodynamic instability (Systolic BP of < 90).

2. EZ-IO may be considered PRIOR to peripheral IV attempts in the following situations:
   a. Cardiac arrest (medical or traumatic)
   b. Profound hypovolemia with alteration of mental status
   c. Patient in extremis with immediate need for delivery of medications and or fluids.

**CONTRAINDICATIONS:**

1. Fracture of the bone selected for IO infusion (consider alternate site)
2. Excessive tissue at insertion site with the absence of anatomical landmarks (consider alternate site)
3. Previous significant orthopedic procedures (IO within 24 hours, prosthesis - consider alternate tibia)
4. Infection at the site selected for insertion (consider alternate site)
CONSIDERATIONS:

1. Flow rate: Due to the anatomy of the IO space, you will note flow rates to be slower than those achieved with IV catheters.
2. Ensure the administration of an appropriate rapid syringe bolus (flush) prior to infusion NO FLUSH = NO FLOW
   a. Rapid syringe bolus (flush) the EZ-IO (Adult) with 10 ml of 0.9% Normal Saline
   b. Rapid syringe bolus (flush) the EZ-IO (Pediatric) with 5 ml of 0.9% Normal Saline
   c. Repeat syringe bolus (flush) as needed
3. To improve continuous infusion flow rates always use a syringe, pressure bag or infusion pump
4. Pain: Insertion of the EZ-IO in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a large bore IV). However, IO Infusion for conscious patients has been noted to cause severe discomfort
5. Prior to IO syringe bolus (flush) or continuous infusion in alert patients, SLOWLY administer Lidocaine (Xylocaine) 2% (Preservative Free) through the EZ-IO hub.
   a. EZ-IO (Adults) Slowly administer 20 – 40 mg Lidocaine (Xylocaine) 2% (Preservative Free)
   b. EZ-IO (Pediatrics) Slowly administer 0.5 mg/kg Lidocaine (Xylocaine) 2%, max dose of 20 mg. (Preservative Free)
6. Site Selection: The following sites may be considered for the insertion of EZ-IO needles, per the manufacturer
   a. Proximal Humerus
   b. Proximal Tibia

EQUIPMENT:

- EZ-IO® Driver
- EZ-IO Needle Set
- Alcohol or Betadine Swab
- EZ-Connect® or Standard Extension Set
- 10 ml Syringe
- 0.9% Normal Saline (or suitable sterile fluid)
- Pressure Bag or Infusion Pump
- 2 % Lidocaine (Xylocaine) (preservative free)
- EZ-IO® Yellow wristband
PROCEDURE:

If the patient is conscious, advise of **EMERGENT NEED** for this procedure and obtain informed consent. (For pediatric patients contact medical control physician)

- Wear approved Body Substance Isolation Equipment (BSI)
- Determine EZ-IO Indications
- Rule out Contraindications
- Locate appropriate insertion site
- Prepare insertion site using aseptic technique
- Prepare the EZ-IO® driver and appropriate needle set
- Stabilize site and insert appropriate needle set
- Remove EZ-IO® driver from needle set while stabilizing catheter hub
- Remove stylet from catheter, place stylet in shuttle or approved sharps container
- Confirm placement
- Connect primed EZ-Connect®
- Slowly administer appropriate dose of **Lidocaine (Xylocaine) 2%** (Preservative Free) IO to conscious patients
- Syringe bolus (flush) the EZ-IO® catheter with the appropriate amount of normal saline.
- Utilize pressure (pressure bag or infusion pump) for continuous infusions where applicable
- Begin infusion
- Dress site, secure tubing and apply wristband as directed
- Monitor EZ-IO® site and patient condition
MOVING HEAVY PATIENTS

The Ferno-Washington cot used at Nationwide Arena has a weight limit of 400 lbs.

This 400 lbs. limit includes the total weight of the patient, equipment and accessories.

Patients weighing equal to or more than or estimated to weigh equal to more than 400 lbs (including the total weight of the patient, equipment and accessories) shall be transported as follows:

1. Use as many personnel as deemed necessary to insure the safety of the crew and the patient. Ten carrying handles are available on the heavy patient mover.
2. A backboard slot has been built into the mover to provide additional support when moving patients WITHOUT suspected cervical injuries. Any patient WITH suspected cervical injuries must be fully immobilized onto a backboard, independent of the mover.
3. The patient should be loaded onto the mover, carried low to the ground (<6”) and placed onto our cot that is in the down position. The cot shall remain in the down position at all times.
4. The cot may be rolled in the down position while moving the patient over smooth surfaces such as sidewalks and parking lots.
   a. Again, the cot shall remain in the down position at all times.
5. The patient will be secured to the cot using the three-strap system provided with the cot and if necessary with the strap extenders found in each heavy patient mover kit.
6. The cot shall be loaded into the medic while in the down position. This will require four or more personnel to lift the cot.
7. The hospital should be called early in the run so that a hospital type bed suitable to support the actual or estimated weight may be brought to the ER entrance.
8. The patient shall be loaded directly from the truck onto the hospital bed without removing the cot from the truck.
9. Every attempt to retrieve the heavy patient mover and the strap extenders shall be made before leaving the hospital.
10. **MAXIMUM LOAD LIMIT FOR THE HEAVY PATIENT MOVER IS 1000 LBS.**
    a. Alternatives to the mover must be developed should a patient present weighing more than 1000 lbs.
KING LT-D INSERTION

- Using the information provided, choose the correct KING LT-D size, based on patient height.
- Test cuff inflation system by injecting the maximum recommended volume of air into the cuffs (size 3 - 60ml; size 4 - 80ml; size 5 - 90ml). Remove all air from both cuffs prior to insertion.
- Apply a water-based lubricant to the beveled distal tip and posterior aspect of the tube, taking care to avoid introduction of lubricant in or near the ventilatory openings.
- Have a spare KING LT-D ready and prepared for immediate use.
- Pre-oxygenate.
- Achieve the appropriate depth of anesthesia. (An adequate level of anesthesia is required before attempting insertion of the KING LT-D. Standard monitoring techniques should be followed when inducing anesthesia. In general, the depth of anesthesia needed is a little more than that required for the insertion of a Guedel-type airway. It is recommended that the less experienced user choose a slightly deeper level of anesthesia.)
- Position the head. The ideal head position for insertion of the KING LT-D is the “sniffing position”. However, the angle and shortness of the tube also allows it to be inserted with the head in a neutral position.
- Hold the KING LT-D at the connector with dominant hand. With non-dominant hand, hold mouth open and apply chin lift.
- With the KING LT-D rotated laterally 45-90 such that the blue orientation line is touching the corner of the mouth, introduce tip into mouth and advance behind base of tongue.
- As tube tip passes under tongue, rotate tube back to midline (blue orientation line faces chin).
- Without exerting excessive force, advance KING LT-D until base of connector is aligned with teeth or gums.
- Holding the KLT 900 Cuff Pressure Gauge in non-dominant hand, inflate cuffs of the KING LT-D to 60 cm H2O. If a cuff pressure gauge is not available and a syringe is being used to inflate the KING LT-D, inflate cuffs with the minimum volume necessary to seal the airway at the peak ventilatory pressure employed (just seal volume).
  - Typical inflation volumes are as follows:
    - Size 3 at 45-60ml
    - Size 4 at 60-80ml
    - Size 5 at 70-90ml
KING LT-D INSERTION (CONT.)

- Attach the breathing circuit to the 15 mm connector of the KING LT-D. While gently bagging the patient to assess ventilation, simultaneously withdraw the airway until ventilation is easy and free flowing (large tidal volume with minimal airway pressure).
- Depth markings are provided at the proximal end of the KING LT-D which refers to the distance from the distal ventilatory opening. When properly placed with the distal tip and cuff in the upper esophagus and the ventilatory openings aligned with the opening to the larynx, the depth markings give an indication of the distance, in cm, from the vocal cords to the upper teeth.
- Confirm proper position by auscultation, chest movement and verification of CO2 by capnography.
- Readjust cuff inflation to 60 cm H2O (or to just seal volume).
- Secure KING LT-D to patient using tape or other accepted means. A bite block can also be used, if desired.
ENDOTRACHEAL TUBE INTRODUCER (ETI)
(“Bougie”, “Flexiguide”)

The tracheal tube introducer is used to facilitate difficult intubation. It should not be confused with the more rigid stylet, which is inserted into the ET tube and used to alter its shape prior to intubation.

Unlike the stylet, a bougie is inserted independently of the ET tube and is used as a guide. Since the ETI is considerably softer, more malleable, and blunter than a stylet, this technique is considered to be a relatively atraumatic procedure. It is used where a difficult intubation is anticipated, or a poor view of the glottic opening has been confirmed on laryngoscopy.

Listed below is a general guide to the procedure. It may be modified as needed due to patient’s position, anatomical features, or other conditions as needed.

- Prepare the endotracheal tube introducer for use: Curve the ETI and ensure the distal tip is formed into a J (coudé) shape;
- Perform a laryngoscopy, obtaining the best possible view of the glottic opening. You should always be able to view the tip of the epiglottis and, ideally, the arytenoid cartilages;
- Advance the bougie, continually observing its distal tip, with the concavity facing anteriorly;
- Visualize the tip of the bougie passing posteriorly to the epiglottis and (where possible) anterior to the arytenoid cartilages;
- Once the tip of the bougie has passed the epiglottis, continue to advance it in the mid-line so that it passes behind the epiglottis but in an anterior direction;
- As the tip of the bougie enters the glottic opening you may feel ‘clicks’ as it passes over the tracheal rings or the tip may stop against the wall of the airways. This suggests correct insertion, although cannot be relied upon to indicate correct positioning with 100% accuracy. If hold-up is felt, the bougie may then be withdrawn up to 5cm to avoid the ET tube impacting against the carina.
- Hold the bougie firmly in place and pass the endotracheal tube over the proximal end of the bougie.
- As the proximal tip of the bougie is re-exposed, carefully grasp it, assuming control of the bougie.
- The ET tube should then be carefully advanced along the bougie and hence through the glottic opening, taking care to avoid movement of the bougie.

**SUCCESSFUL INTUBATION MAY BE CONSIDERABLY ENHANCED BY ROTATING THE ET TUBE 90° COUNTER CLOCKWISE, SO THAT THE BEVEL FACES POSTERIORLY.** In so doing the bougie may also rotate along the same plane but should not be allowed to move up or down the trachea.
- Once the ET tube is fully in place hold it securely as you slowly withdraw the bougie.
- Inflate the cuff.
- Follow normal confirmation procedures.
- Secure the tube.
FOOTBALL HELMET REMOVAL

Therefore, a football player who is injured on the field with no signs of airway compromise should be transported in full vertical spine precautions WITH THE HELMET LEFT ON. A rigid cervical collar should be applied and the patient placed on a full backboard with the helmet taped down to the backboard. Straps should secure the body to the backboard and appropriated head restraint system should be utilized. The shoulder pads should be left on.

If the airway needs to accessed, then the facemask on the helmet may be removed by cutting the clips that secure the mask to the helmet. If the airway needs to be secured by endotracheal intubation, attempts should be made to intubate the trachea with the helmet on while maintaining cervical spine immobilization. If the airway cannot be secured in this manner, then the helmet can be removed using the two-person technique under cervical spine control and another attempt made at intubating the airway. If the helmet is removed the shoulder pads should also be cut away and removed. Cricothyroidotomy, if needed, can also be done leaving the helmet on.
NEEDLE CRICOTHYROIDOTOMY

Indication for use:

- Unsuccessful endotracheal intubation.
- Severe facial trauma, particularly unstable mandibular fracture.
- Severe laryngeal trauma.
- Obstructing tumors.
- Burns of the face, and upper airway, precluding intubation.
- Pharyngeal hematomas - usually secondary to cervical spine injury.
- Impacted foreign bodies.
- Strongly suspected cervical fractures.

Technique:

- Consider Sedation
- Palpate the hyoid, thyroid notch, cricothyroid interval and sternal notch.
- If time permits, prep area with Betadine.
- Stabilize the thyroid cartilage make transverse or vertical incision through the skin approx. 2.5cm (1in) over the lower half of the cricothyroid membrane.
- Use a 14ga angiocath with syringe and puncture skin midline directly over the cricothyroid membrane. (18ga or 16ga angiocath may be needed for pediatric patient)
- Direct the angiocath 45 degrees in a caudally.
- Insert the through the lower half of the membrane while aspirating the needle, when air enters syringe, entry into the trachea is obtain.
- Use 3.5mm endotracheal tube adapter and secure.
- Ventilate at a rate of 1 second on and 4 seconds off.
NEEDLE CHEST DECOMPRESSION

- Insert 14 gauge 2½ inch or larger angiocath into the second or third intercostal space over top of the rib, in the midclavicular line.
- Remove the needle.
- Attach 30-50cc syringe and relieve pressure as needed.
- Leave the syringe open to air with a flutter valve attached.
- Intubation is highly recommended after decompression.
- Monitor EKG and respiratory status.
PHYSICAL RESTRAINT PROTOCOL

A restraint refers to the process of physical hindering of a violent or combative patient from harming him/her self or others when non-physical means have failed.

PURPOSE/INTENT:

- To ensure protection of both rescuer and patient
- Restraint is to be only as a last resort
- To be performed in a non-antagonistic manner

AUTHORIZED FORMS OF RESTRAINT:

- Commercially manufactured soft restraints
- Backboard straps
- Reeves Sleeve
- Sheets

UNAUTHORIZED FORMS OF RESTRAINT:

- Choke holds
- Plastic ties
- Sandwich backboard techniques
- Handcuffs are only to be applied by law enforcement personnel. The patient must be cuffed in the front and officer must accompany the patient at all times. Ensure officer is placed in the back of the transport vehicle and is not within the immediate reach of the patient.

PATIENT POSITIONING:

- The patient shall not be placed in the prone position at any time while restrained.
- The patient’s head shall not be restrained at any time unless c-spine control is needed.
- Nothing shall be placed in the oral cavity. A facemask may be used on the patient who exhibits biting or spitting behavior. The mask shall be removed immediately if the patient exhibits impending emesis or signs of respiratory compromise.
PROCEDURE FOR APPLICATION OF RESTRAINT:

- Ensure safety of the crew.
- Ensure necessary manpower.
- Removal of family if necessary.
- All 4 limbs and waist shall be properly restrained.
- All restraints applied shall be in full view at all times.
- Restrained extremities shall be monitored for color, nerve, motor function, and pulse at 10-minute intervals.
- Anytime patient is restrained EMS personnel shall remain with patient.
- Include arena Security and in house Columbus Police officer/officers
- Should the patient break restraint and escape EMS/fire personnel shall take no action to subdue the patient. If necessary you should defend yourself. Law enforcement shall be notified.

RERAINT DOCUMENTATION:

- Reasons and method(s) used for restraint.
- Agency responsible for restraint application (i.e. EMS, police).
- Documentation of cardio-respiratory status and peripheral neurovascular status.
EMS REPORTING PARAMETERS WHEN ENCOUNTERING SINGLE/MULTIPLE POTENTIAL PATIENTS REFUSING TREATMENT AND/OR TRANSPORT

Purpose:

To establish departmental guidelines for documentation of incidents involving a single potential patient or multiple potential patients who refuse treatment and/or transport.

Perspective:

OhioHealth EMS personnel often arrive at the scene of an incident and makes contact with multiple parties who neither request nor require medical assistance. Regardless of the outcome, a medical record of the event must be maintained.

Parameters:

1. Single potential patient who declines assistance:
   An EMS Incident Report with:
   - A brief description of the incident
   - Patient name
   - Address
   - Age
   - Contact phone number
   - Refusal of service signature

   This report must include a brief statement describing why the EMS provider and the patient opted against treatment and/or transport.

2. Single potential patient who accepts treatment but refuses transport:
   An EMS Incident Report with:
   - A thorough assessment
   - A description of the incident
   - Patient name
   - Address
   - Age
   - Contact phone number
   - Documentation of offer to transport
   - Refusal of service signature

3. Multiple potential patients who declines assistance:
   A single EMS Incident Report with a list of:
   - Names
   - Addresses
   - Ages
   - Contact phone numbers
   - Refusal of service signature
POLICY AT THE SCENE OF ACCIDENTAL DEATH, MURDER OR SUICIDE

It is essential that, at the scene of an accidental death, murder, suicide, or death as a result of any suspicious or unusual manner, that the medic make every effort to preserve the evidence for the coroner and the police.

At the scene of a death that is as a result of murder, suicide, criminal or other violent means, the body shall not be moved. The coroner has sole jurisdiction in such cases.

If, in the opinion of the medic, life is present, then immediate resuscitative measures should be instituted. Then person may be moved to a hospital at the discretion of the person or persons in charge of the emergency medical service. The scene should be preserved in case the individual subsequently expires.

It is the medic’s duty to determine whether the individual is alive and needs emergency medical attention and removal to a hospital or whether the individual has expired and should not be moved.

While the medic may have the ultimate authority to move a body, they must answer to the coroner if bodies or persons who have expired at the scene are moved and explain the clinical medical indications that led to their decision.
MUCOSAL ATOMIZATION DEVICE (MAD)

INDICATION:
IN THE CASE, IN WHICH IV ACCESS CANNOT BE ESTABLISHED OR WHEN MEDICATION NEEDS TO BE ADMINISTERED QUICKLY.

BENEFIT:
THE INTRANASAL ROUTE CAN REDUCE THE RISK OF MULTIPLE NEEDLE STICKS WHILE DELIVERING EFFECTIVE MEDICATION LEVELS. THE VASCULATURE OF THE NASAL CAVITY PROVIDES A DIRECT ROUTE INTO THE BLOODSTREAM FOR MEDICATIONS THAT EASILY CROSS THE MUCOUS
MEMBRANES. THE DIRECT ABSORPTION INTO THE BLOODSTREAM IS RELATIVELY COMPARABLE TO THAT OF MEDICATION GIVEN VIA AN IV.

CONTRAINDICATIONS:
- EPISTAXIS (NOSEBLEED)
- NASAL TRAUMA
- NASAL SEPTAL ABNORMALITIES
- NASAL CONGESTION / DISCHARGE

MEDICATION THAT MAY BE USED INTRANASAL:
- NALOXONE (NARCAN)
- MIDAZOLAM (VERSED)

PROCEDURE:
- DRAW UP MEDICATION INTO A SYRINGE USING APPROPRIATE TRANSFER NEEDLE
- INTRANASAL DOSE IS THE SAME AS IV / IM DOSE AS OUTLINED IN APPROPRIATE STANDARD MEDICAL ORDERS.
  - DO NOT EXCEED 1 ML PER NOSTRIL
  - REMOVE AIR FROM SYRINGE
- REMOVE NEEDLE AND PLACE MAD NASAL TIP ONTO SYRINGE
  - PLACE MAD TIP INTO NOSTRIL
- TIMING THE RESPIRATIONS, DEPRESS THE PLUNGER RAPIDLY WHEN PATIENT FULLY EXHALES AND BEFORE INHALATION
- EVALUATE THE EFFECTIVENESS OF THE MEDICATION, IF DESIRED EFFECT HAS NOT BEEN ACHIEVED, CONSIDER REPEATING AND/OR CHANGING ROUTE OF ADMINISTRATION

NOTE: INDICATION, CONTRAINDICATIONS, ACTIONS AND SIDE EFFECTS ARE THE SAME WHEN GIVEN INTRANASAL AS THEY WOULD BE IF THE MEDICATION WERE GIVEN IV, IM OR IO.
CONCEALED WEAPON

House Bill 12, the Ohio Concealed Carry Law, also known as the CCW Law (Carrying Concealed Weapon) took effect on April 8, 2004. A distinct probability now exists for our department to encounter an increasing number of patients legally carrying concealed weapons. Police departments are unlikely to assume responsibility for a weapon that is in the possession of a legally permitted, competent individual who has not given them a reason to confiscate it.

SCOPE:

The guidelines contained herein describe best practice methods for promoting the safety of the public and for the personnel assigned to their care

LICENSES:

Two types of CCW Licensure are available.

A license may be issued to those citizens issued a certification of completion for a 10 hour (with an additional 2 hours of experience shooting a handgun) firearms safety course meeting minimum educational requirements, including:

- The ability to name, explain and demonstrate the rules for safe handling of a handgun and proper storage practices for handguns and ammunition;
- The ability to demonstrate and explain how to handle ammunition in a safe manner;
- The ability to demonstrate the knowledge, skills and attitude necessary to shoot a handgun in a safe manner;
- Gun-handling training.

The second type of license, a Temporary Emergency License lasting only 90 days may be issued, provided extraordinary circumstances exist.

Additional requirements pertaining to residency, criminal records checks, mental competency, and protection orders must also be met prior to receiving a license to carry a concealed weapon.

Once all conditions are met to the satisfaction of the sheriff of the applicant’s residential county, a concealed handgun license must be issued within 45 days of receiving a properly completed application.

Carrying a concealed weapon is a privilege, not a right. Citizens successfully demonstrating the competency and ability to safely manage the responsibility of carrying a concealed weapon are within their legal rights to do so.
POLICY:

OhioHealth EMS personnel will NOT attempt to determine the validity of a license. Under no circumstances will personnel, once having assumed custody of a weapon, return a weapon to a patient. Should a patient decide to refuse aid and/or transport AFTER personnel have assumed custody of a weapon, the weapon will only be transferred to the custody of the police, not to the patient. CPD will be called to assist with these patients. The police will then determine the validity of the license.

With respect to citizen rights under HB 12 and also to the department’s obligation to ensure the safety of its members and the citizens we protect, contingent upon meeting strict criteria, secure handguns for:

- Conscious patients unable to leave the weapon in a secured area such as a gun safe AND willing to relinquish custody to the crew prior to transport;
- Patients with Altered Levels of Consciousness, IF crew members are able to safely secure the weapon prior to transport

Conscious patients UNWILLING to leave the weapon in a secured area such as a gun safe OR unwilling to relinquish custody to the crew prior to transport will NOT be loaded into the medic and will NOT be transported with the weapon.

Law Enforcement Officers are exempt from complying with the provisions of this policy PROVIDED that the patient is restrained by four extremities AND three cot straps. Law enforcement officers being transported as a patient SHALL comply with these provisions by either relinquishing custody of their weapon(s) to the crew prior to transport or preferably to another officer prior to transport.

Family members, friends, or coworkers, etc. whether requested by the crew OR requesting to accompany our patient to the hospital are NOT exempt from complying with the provisions of this policy.

The primary goal when encountering a patient with a weapon is to have the patient transfer custody of the weapon prior to transport. In the event that transfer to a secured area such as a gun safe is not possible, the following guidelines are suggested:

REMEMBER: If you are ever in doubt about scene safety, your safety or your crew’s safety, leave the scene immediately and have the police secure the area before returning to the patient. Always use sound judgment and caution when dealing with weapons of any kind.
PROCEDURES:

Four types of weapons contact are possible:

CONSCIOUS PATIENTS WILLING TO RELINQUISH WEAPON:

- Prior to loading the patient;
- Patient signs handheld to verify custody transfer;
- Crew conducts a thorough physical exam using Complete Search technique;
- If no other weapons found, transport;

CONSCIOUS PATIENTS UNWILLING TO RELINQUISH WEAPON:

- Communicate sound medical reasoning for transport;
- Explain procedures for safe handling and security of weapons while attempting to encourage patient to relinquish custody;
- If patient continues to refuse to relinquish custody, REFUSE TO TRANSPORT;
  1. Evacuate the scene

PATIENTS WITH ALTERED LEVELS OF CONSCIOUSNESS:

- If a patient with an altered level of consciousness carrying a firearm is encountered AND we can safely remove the holster from the person, then do so with the weapon still in the holster, if not remove the weapon from the holster;
- Alternative: Transfer custody to law enforcement at the scene.

FAMILY MEMBERS OR BYSTANDERS:

- Upon relinquishing custody of their weapon(s) as outlined in the procedures above, family members or bystanders are allowed to accompany the patient to the hospital.

SPECIAL NOTES:

**DO NOT EVER ATTEMPT THE PATIENT TO CLEAR A WEAPON.** Regardless of a person’s familiarity with firearms, there is no way to know if any modifications have been made or if the weapon is in good working order.

If the patient is unconscious, disoriented or incapacitated in any way, there is no way to verify that they are a legitimate permit holder and law enforcement should be notified. Assume control of the weapon and if possible, turn it over to law enforcement officers at the scene.

If patient is carrying a weapon in a “Forbidden Carry Zone”, even though they are a legitimate permit holder, law enforcement should be called.

Remember that having a weapon while intoxicated is a criminal offense. The police should be notified any time this situation is encountered.

When in doubt **CALL THE POLICE.**
Attached is a brief, graphic representation in algorithm form to use for reference. This algorithm is not comprehensive, however does contain necessary references of use in making an informed decision.

ALWAYS ASSUME ALL WEAPONS ARE LOADED!!!!
EVALUATION AND ASSESSMENT OF PATIENTS IN POLICE CUSTODY

Purpose:

To establish, departmental guidelines for evaluation and assessment of patients in police custody.

Perspective:

OhioHealth EMS may be required to treat patients in police custody. Use of less than lethal weapons is occasionally deemed necessary by law enforcement personnel to subdue a person. Use of these types of weapons, i.e.: pepper spray or Taser, to subdue a violent person implies that he/she is/was a risk to him/herself or to others.

Responsibility:

Persons in police custody are the responsibility of the arresting officer. Every attempt should be made on our part to thoroughly evaluate the person’s condition and make recommendations to the officer. The decision to treat and/or transport to a tertiary care facility, or not, remains with EMS, however, it is important for event medical services personnel to provide guidance that ultimately protects all parties involved.

Parameters:

The possibility exists that event medical services personnel may be called to evaluate persons in custody of police agencies other than Columbus Police. Again, the decision to treat and/or transport to a tertiary care facility, or not, remains with EMS. Remember that it is critical for event medical services personnel to provide guidance that ultimately protects all parties involved. Decisions to transport or not to transport should be based solely on medical evidence gathered during a thorough medical/trauma assessment as outlined in the OhioHealth EMS Protocol. It is recommended however, that tased persons receive a thorough medical screening by a physician.

Occasionally a person in police custody will not allow an appropriate examination to be conducted (uncooperative, violent, etc.). In the event your safety, your crew’s, the officers involved or the patient’s safety might be compromised by attempting to conduct an assessment, every effort must be made to determine the circumstances surrounding the event prior to your arrival.
Under no circumstances are you expected to place yourself, your crew, the officers involved or the patient in jeopardy by attempting to conduct an assessment. Let judgment and common sense prevail. Any patient in need of immediate medical care should be appropriately restrained and outlined in the OhioHealth EMS Protocol and cared for during transport to a tertiary care facility.

**Pepper Spray:**

Persons sprayed with pepper spray should be evaluated for allergic reactions to the product and for respiratory compromise. Due to wind drift and permeation of fumes from sprayed persons, pepper spray may affect police and care providers as well.

Persons experiencing symptoms of “burning” of the eyes and face or other areas contacted by the spray shall be treated using pepper spray wipes such as Sudecon, saline flush or both.

If transporting a person that has been sprayed, remember to field decontaminate the person prior to loading in the transport vehicle. Removal of contaminated clothing and an initial wipe-down with a Sudecon is sufficient to remove the majority of the contaminant. Remember that fumes permeate from the patient and providers are less likely to suffer the effects if the patient is decontaminated prior to placement in the confined patient care compartment of a medic.

**Taser:**

Whenever called to assess a person who has been subdued by a Taser, a thorough medical and trauma assessment must be completed unless such exam might jeopardize personal and/or crew safety. A thorough exam is necessary to determine the circumstances that lead to the person being tased. Many Taser related deaths have been linked to subjects who had illegal drugs in their systems. Providers must work to rule out a medically-related problem that led to the person being tased.

Studies demonstrate that injuries resulting from Tasers are primarily related to falling during the application of current. Treat any injuries or symptoms following OhioHealth EMS Protocols.

Probes may be removed from the person UNLESS embedded in the face (including eyes), neck, groin or spinal column or the chest of a female. If probes are found in the face (including eyes), neck, groin, spinal column or chest of a female, the wires may be cut and the barbs stabilized for removal by a physician in the Emergency Department.
If probes are to be removed:

- Take Universal Precautions and use BSI
- Place one hand on the patient in the area where the probe is embedded to stabilize the skin surrounding the puncture site.
- Wrap the Barb shaft with a sterile dressing and firmly grasp the probe with the other hand and in a fluid motion pull the probe straight out from the puncture site.
- Repeat the procedure with the second probe
- Handle all probes as SHARPS and secure appropriately UNLESS the PD requires the probes for evidence. If PD requires the probes for evidence, place the probes in an evidence collection container of their choice.
- Cleanse the puncture sites with alcohol wipes and bandage as appropriate.
- If the patient has not received a tetanus shot within the past five years, they should be advised to do so.

Police officers may sign a medical refusal on behalf of the patient UNLESS they meet transport criteria as defined in the OhioHealth EMS Protocols.

The key to evaluating patients in police custody is common sense. Make good medical decisions based on a thorough medical assessment.

Medical Research Reports
HYDROFLUORIC ACID PROTOCOLS

A. GENERAL CARE

- Safety of the rescuer and the medical personnel should be kept as a high priority.
- BSI precautions should be taken whenever you contact the victim or their clothing.
- All victims of HF burns should be carefully examined to insure there are no other burned areas which may have been overlooked.
- Signs and symptoms of Hypocalcemia (confusion, larynx spasms, and seizures) should be observed for in HF exposure victims.
- Extra attention should be taken when the respiratory system is involved or areas of skin larger than 25 square inches are involved.

B. INHALATION INJURIES

- Personnel with proper protective equipment should remove the patient from hazardous area.
- Start the Basic Life Support if needed, using a pocket mask or microshield for protection if burns are noted around the mouth and face.
- Start Patient on Oxygen by NRB, monitor pulse ox, EKG, and vitals signs.
- In severe inhalation intubation or Cricothyroidotomy may be needed to provide airway.
- Start IV of 0.9% Normal Saline, restrict if signs of pulmonary edema.
- Nebulizer treatment using 2.5% Calcium Gluconate solution.
  - Using a 10cc syringe, draw up 6cc of Sterile Water and 3cc of Calcium Gluconate solution.
  - Treat other burns or injuries as per HF protocol.

C. INGESTION INJURIES

- If HF is ingested, severe burns to the mouth, esophagus, and stomach may occur.
- Systemic effects may also.
- Consider the possibility of inhalation injury and treatment.
- If HF is ingested, have patient drink several glasses of water to dilute. (Milk or Milk of Magnesia is preferred over water if available).
  - DO NOT INDUCE VOMITING.
  - Monitor patient vitals signs, airway, pulse ox, as in Inhalation Injuries.

D. SKIN INJURIES

- Immediately flush exposed areas with large amounts of water for 15 minutes.
  - If Calcium Gluconate is available the time required for flushing can be reduced to 5 minutes.
  - Use BSI precautions as soon as possible for your personal protection.
• Remove all contaminated clothing while flushing with water.
• **Calcium Gluconate** gel should be used for the burned areas.
  • To make **Calcium Gluconate** gel:
    • Take the 10cc vial of **10% Calcium Gluconate** solution and 2oz tube of KY Jelly (taped together in HF kit) and mix them together in a cup.
    • Apply the gel to the affected area liberally and continue to massage in.
    • Pain relief should be achieved in about 45 minutes.
    • Transport to Hospital for possible injections if not relieved.
• For large burn areas, begin soaking these affected areas in a **13% Zephiran**.
  • To mix **Zephiran**:
    • Take 1 ounce of stock **Zephiran** and add to 1 gallon of water.
    • If immersion is not practical, towels should be soaked with the diluted **Zephiran** solution and used as compresses over the burn areas. Change the compresses every two minutes and continue this for at least 2 hours.
    • Ice cubes should be added to the **Zephiran** solution as soon as possible.
  • **HOSPITAL USE ONLY**:  
    • There should be pain relief with the above treatment. If not, then an alternate treatment should be used, such as **Calcium Gluconate** subcutaneous injections.
    • If treatment was delayed or if **Zephiran** and **Calcium Gluconate** gel does not relieve the pain, **Calcium Gluconate** can be injected. If burn area covers greater than 25 square inches, injections are indicated. If **10% Calcium Gluconate** injections are used, the amount injected to start with should not exceed more than 0.5ml per square centimeter, and not distort the appearance.

E. EYE INJURIES

• Flush eyes with large amounts of water for 15 minutes.
• Mix 500cc of **0.9% Normal Saline** with **Calcium Gluconate** 10% to equal a 1% solution.
  • Put 5 ampules of the **Calcium Gluconate** into the 500cc bag of **0.9% Normal Saline**.
  • Connect bag, tubing and Morgan lenses together and flush the tubing.
• The **0.9% Normal Saline, Calcium Gluconate**, tubing and the Morgan lenses can be found in the HF Kit.
• Prior to inserting the lenses, instill 2 drops of **Prontocaine** or other aqueous, topical ophthalmic anesthetic solution in the affected eye/eyes.
• Insert the Morgan lenses into the injured eyes and run the **1% Calcium Gluconate** solution at the proper rate for the injury.
  • For **MILD HF** exposure, irrigate 10-15 minutes at a rate of 250gtts/min.
  • For **SEVERE HF** exposure, irrigate 1-2 hours at a rate of 60 - 100gtts/min.
ACTIONS AT MAJOR MEDICAL INCIDENT

In the event of a major medical event, members of the OhioHealth EMS may be asked to administer medications that are not listed on their drug license or not addressed in their protocol.

Exception to the medical protocol and standing orders shall be permitted contingent upon all the following:

- An “Emergency” shall have been declared by the Health Commissioner having jurisdiction
- Our agency shall be directed to function under the authority of the Commissioner
- Prior to administration EMS members shall be provided with written information related to the medication such as indications, contraindications, precautions, side effects, dosage, route, etc.
- The OhioHealth EMS Medical Director shall be notified as soon as possible of any deviations from the protocol.
- These guidelines shall remain effective from the time of “Emergency” declaration until the commissioner having jurisdiction officially terminates the “Emergency”
PATIENT TRANSPORT POLICY

It is the recommendation of the medical director that once having followed the OhioHealth EMS Protocol and treatment objectives set forth by the State of Ohio, that:

Manageable patients should be transported to their local hospital emergency department of choice.

Unmanageable patients should be transported to the closest appropriate hospital emergency department.

On all stable victims, who in the judgment of the medic personnel, do not need immediate emergency care, alternate transportation shall be recommended such as private autos or taxies. If any EMS personnel decide it to be in the best interest to transport the patient, then the patient shall be transported to the most appropriate hospital emergency department.

The following in this section shall be used to help with determining transport decisions:

1. Transport all patients who attempt suicide or threaten to attempt suicide to the most appropriate medical facility
2. Transport significant trauma to Level I or Level II trauma center using the following Adult and Pediatric Trauma guidelines (Trauma Transport Criteria – Adult, Trauma Transport – Pediatric Criteria):

   Central Ohio Hospitals that are currently verified as Level I by the American College of Surgeons

   - Children’s Hospital (Pediatric Level I)
   - Grant Medical Center (Adult Level I)
   - Ohio State University Wexner Medical Center (Adult Level I)
   - Riverside Methodist Hospital (Adult Level II)
   - Mount Carmel West (Adult Level II)
These criteria are based on Ohio’s legislated Prehospital Trauma Triage Criteria. Subtle differences reflected here demonstrate Central Ohio’s regional capabilities to care for trauma victims. The State of Ohio definition of trauma is that *trauma victims and trauma injuries have an indication of severe damage to or destruction of tissue in which there is significant risk of loss of life, loss of limb, permanent disfigurement, AND/OR permanent disability.* Pediatric patients are defined as less than age 16. Geriatric patients are defined as those adults 70 years of age and older.

**ADULT patients** with any of the following signs or symptoms subsequent to a traumatic injury should be transported directly to an Adult Trauma Center per Agency SOPs. Adult trauma Centers in Franklin County, Ohio include:

**Grant Medical Center, Mount Carmel West,**
**The Ohio State University Medical Center & Riverside Methodist Hospital**

<table>
<thead>
<tr>
<th>MULTISYSTEM TRAUMA</th>
<th>ADULT (16 years and older)</th>
<th>GERIATRIC (70 years and older): Differences from the General Adult Population are Underlined</th>
</tr>
</thead>
</table>
| Injury with any one of the following physiologic A-B-C-D criteria: | ✤ Airway/Breathing: RR<10 OR >29; OR requiring endotracheal intubation; OR relief of tension pneumothorax  
✤ Circulation: HR>120 OR SBP<90 with suspicion of hemorrhagic shock, OR absent radial pulse with carotid pulse present  
✤ Disability: GCS <13; OR GCS Motor Score<5; OR LOC > 5 minutes | ✤ Airway/Breathing: Same criteria as Adult  
✤ Circulation: Same criteria EXCEPT SBP<100  
✤ Disability: Same criteria EXCEPT GCS <15 with suspected head injury  
✤ Multiple body regions injured |
| Head, Neck, or Torso injuries with any one of the following criteria: | ✤ Head, Neck, Torso: Any penetrating OR visible crush injury  
✤ Skull: Open or suspected skull fracture  
✤ Chest: Flail chest  
✤ Pelvis: Unstable pelvis OR suspected pelvic fracture  
✤ Abdomen: Tenderness, distension; OR “seat belt sign”  
✤ Paralysis or other signs of spinal cord injury | All with Same Criteria as Adults |
| Extremity Orthopedic Injury with any one of the following criteria: | ✤ Fracture of 2 or more long bones (humerus/femur) OR significant open fracture  
✤ Visible crush injury  
✤ Amputation proximal to wrist or ankle  
✤ Neurovascular compromise | All with Same Criteria as Adults EXCEPT also Fracture of any one long bone sustained in a motor vehicle crash |
| Extremes of Temperature: | ✤ Second (partial thickness) OR Third (full thickness) Degree Burns > 10% TBSA  
✤ Significant burns involving face, airway, hands, feet, OR genitalia  
✤ Suspicion of profound hypothermia secondary to environmental exposure | All with Same Criteria as Adults |

**NOTE:** *Transport trauma burn patients to The OSU Medical Center*

<table>
<thead>
<tr>
<th>Eye Injury:</th>
<th>✤ Globe injury</th>
<th>All with Same Criteria as Adults</th>
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</thead>
</table>

**NOTE:** *Transport isolated globe injuries to Grant Medical Center, Mount Carmel West or The Ohio State University Medical Center*
**PEDiATRIC patients** with any of the following signs or symptoms subsequent to a traumatic injury should be transported directly to a Pediatric Trauma Center per Agency SOPs. The Pediatric trauma Center in Central Ohio is:

**Nationwide Children’s Hospital**

**EXCEPTION:** Trauma patients <16 years of age who appear **pregnant** or give a history of pregnancy should be transported to an **ADULT** trauma center.

<table>
<thead>
<tr>
<th>MULTI-SYSTEM TRAUMA</th>
<th>PEDIATRIC (less than 16 years of age)</th>
</tr>
</thead>
</table>
| Injury with any ONE of the following physiologic A-B-C-D criteria: | ✤ Airway/Breathing: Evidence of respiratory failure or distress including tachypnea, bradypnea, stridor, grunting, retractions, cyanosis, hoarseness, and/or difficulty speaking  
 ✤ Circulation: Evidence of poor perfusion including tachycardia, bradycardia, weak/absent peripheral pulses, pallor, cyanosis, and/or delayed capillary refill distal  
 ✤ Disability: GCS <13 OR Motor Score< 5; OR LOC > 5 minutes |
| Head, Neck, or Torso injuries with any ONE of the following criteria: | ✤ Head, Neck, Torso: Any penetrating OR visible crush injury to head, neck, or torso  
 ✤ Skull: Open or suspected skull fracture  
 ✤ Chest: Flail chest  
 ✤ Pelvis: Unstable pelvis OR suspected pelvic fracture  
 ✤ Abdomen: Tenderness, distension; OR “seat belt sign”  
 ✤ Paralysis or other signs of spinal cord injury |
| Extremity Orthopedic Injury with any ONE of the following criteria: | ✤ Fracture of 2 or more long bones (humerus/femur) OR significant open fracture  
 ✤ Visible crush injury  
 ✤ Amputation proximal to wrist or ankle  
 ✤ Neurovascular compromise |
| Extremes of Temperature: | ✤ Second (partial thickness) OR Third (full thickness) Degree Burns > 10% TBSA  
 ✤ Significant burns involving face, airway, hands, feet, OR genitalia  
 ✤ Suspicion of profound hypothermia secondary to environmental exposure |
| Eye Injury: | ✤ Globe injuries |

**ALSO TRANSPORT TO A TRAUMA CENTER FOR ANY THE FOLLOWING EVEN IF NO OTHER SYMPTOMS ARE PRESENT:**

<table>
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<th>MECHANISM OF INJURY (MOI)</th>
<th>PRE-EXISTING CONDITIONS / “COMORBIDS”</th>
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</thead>
</table>

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OhioHealth Emergency Medical Services Protocols

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Revised 2013-11
**REGARDING FALLS:**
- Adults: > 20 feet
- Geriatrics: From any distance (even same the same level) with evidence of head injury
- Pediatrics: > 10 feet or 2-3 times child’s height

**REGARDING MOTORIZED VEHICLES:**
- Fatality in same vehicle
- Ejected from vehicle
- Seat belt restraint use & high impact collision
- Intrusion > 12 inches in passenger compartment &/or > 18 inches any site
- Rollover
- Auto-pedestrian impact > 20 mph OR thrown > 15 ft.: For Geriatric patients, any struck by a motor vehicle
- Motorcycle, ATV, or bicycle crash >20 mph
- EMS Provider’s Judgment is such that MOI warrants it

- Anticoagulant use, i.e. Coumadin (warfarin), Lovenox (enoxaparin sodium), Plavix (clopidogrel), Pradaxa (dabigatran etexilate)
- Hemophilia patients should go to The OSU Medical Center OR Nationwide Children’s Hospital
- Cardiac OR Respiratory Disease
- Cirrhosis
- Dialysis if > 70 years of age
- Immunosuppression
- Insulin-dependent diabetes
- Morbid Obesity
- Pregnancy (transport to an adult Trauma Center)
EMERGENCY MEDICAL SERVICES AND PHYSICIAN AT THE SCENE

The following statement of policy is provided in order to clarify the role of the physician at the scene of an emergency.

In the case of a physician at the scene, the medic/squad shall perform its duties in the usual manner under the direction of accepted protocols. Any participation by a physician shall be courteously declined, unless first approved by the in-charge medic.

When a paramedic is operating by written standing orders prepared by a medical advisor or advisory board, a physician at the scene can assume control of the patient and may supersede the written orders of the paramedic and require the cooperation and assistance of the medic/squad.

An EMS Provider is protected by civil immunity when following the direction of a physician unless the actions of the EMS Provider can be characterized as of willful and wanton misconduct.

A fully licensed physician who wishes to assume control of the emergency medical care of the patient must agree to the following:

- Provide the EMS Provider with satisfactory proof that he/she is a physician. The State Medical Board License card is preferred.
- Recognize the Following:
  - EMS Provider can function only within the scope of his/her training and statutory authority.
  - Any orders given beyond the training and/or authority of the EMS Provider or authority requires the physician to be responsible for assuring adequate supervision of the medical care provided during treatment and transport until supervision/control is transferred to receiving hospital personnel.
- The physician agrees to sign a written copy of any order given to the EMS Provider.
- The physician will assume responsibility at the scene, in transit, and until relieved by another physician in the emergency department to which the patient is relieved unless it is a multiple casualty incident or disaster situation and he/she deem it necessary to stay at the scene.
DO NOT RESUSCITATE COMFORT CARE PROTOCOL

After the State of Ohio DNR Protocol has been activated for a specific DNR Comfort Care patient, the Protocol specifies that emergency medical services and other health care workers are to do the following:

**WILL:**

- Suction the airway
- Administer oxygen
- Position for comfort
- Splint or immobilize
- Control bleeding
- Provide pain medication
- Provide emotional support
- Contact other appropriate health care providers such as hospice, home health, attending physician/CNS/CNP

**WILL NOT:**

- Administer chest compressions
- Insert artificial airway
- Administer resuscitative drugs
- Defibrillate or cardiovert
- Provide respiratory assistance (other than that listed above)
- Initiate resuscitative IV
- Initiate cardiac monitoring

If you have responded to an emergency situation by initiating any of the **WILL NOT** actions prior to confirming that the DNR Comfort Care Protocol should be activated, discontinue them when you activate the Protocol. You may continue respiratory assistance, IV medications, etc. that have been part of the patient’s ongoing course of treatment for an underlying disease.

Identification:

Patients can be either DNR Comfort Care patients or DNR Comfort Care - Arrest patients. The difference is that for a DNR Comfort Care patient, the State of Ohio DNR Protocol is activated immediately when a DNR order is issued or when a living will requesting no CPR becomes effective, but for a DNR Comfort Care - Arrest patient, the protocol is activated only when the patient experiences a cardiac arrest or a respiratory arrest. Be careful to check the patient’s DNR order or DNR identification to determine which applies.
A DNR Comfort Care or DNR Comfort Care - Arrest patient’s status is confirmed when the patient has one of the following:

1. A DNR Comfort Care card or form completed for the patient.
2. A completed State of Ohio living will (declaration) form that states that the patient does not want CPR (in the case of a patient who has been determined by two doctors to be in a terminal or permanently unconscious state).
3. A DNR Comfort Care necklace or bracelet bearing the DNR Comfort Care official logo.
4. A DNR order signed by the patient’s attending physician or, when authorized by section 2133.211 of the Ohio Revised Code, a certified nurse practitioner (CNP) or clinical nurse specialist (CNS).
5. A verbal DNR order is issued by the patient’s attending physician, CNP, or CNS.
   - Copies of these items are sufficient.
   - EMS workers are not required to search a person to see if they have DNR Identification.

If an EMS or other health care worker discovers one of these items in the possession of a patient, the worker must make a reasonable effort to identify DNR patients in appropriate circumstances. Examples of ways to verify identity are:

- The patient or a family member, caregiver, or friend gives the patient’s name.
- The health care worker knows the patient personally.
- Institution identification band.
- Driver’s license, passport, or other picture ID.

If you cannot verify the identity of a patient with DNR Identification after reasonable efforts, you still should follow this protocol.

Verification of identity is not required for patients or residents of health care facilities when a DNR order is present on the person’s chart.

EMS personnel who receive a verbal DNR order from a doctor or CNP/CNS must verify the identity of the person issuing the order. Some examples of verification are:

- Personal knowledge of the doctor/CNP/CNS.
- List of practitioners with other identifying information such as addresses.
- A return telephone call to verify information provided.
Activation:

When this protocol is activated for a given DNR Comfort Care patient depends on whether the patient is a DNR Comfort Care patient or a DNR Comfort Care - Arrest patient. For a DNR Comfort Care patient, this protocol is activated when the DNR order is issued or the living will specifying no CPR becomes effective. For a DNR Comfort Care - Arrest patient, the protocol is activated when the patient experiences a cardiac arrest or a respiratory arrest.

“Cardiac arrest” means absence of a palpable pulse. “Respiratory arrest” means absence of spontaneous respiration or presence of agonal breathing.

Actions:

For patients for whom the DNR Comfort Care protocol is activated, you:

Will:

- Suction the airway
- Administer oxygen
- Position for comfort
- Splint or immobilize
- Control bleeding
- Provide pain medication
- Provide emotional support
- Contact other appropriate health care providers such as hospice, home health, attending Physician/CNP/CNS

Will Not:

- Administer chest compressions
- Insert artificial airway
- Administer resuscitative drugs
- Defibrillate or cardiovert
- Provide respiratory assistance (other than that listed above)
- Initiate resuscitative IV
- Initiate cardiac monitoring

If you have responded to an emergency situation by initiating any of the “will not” actions prior to confirming that the DNR Comfort Care Protocol must be activated, discontinue them when you activate the protocol. You may continue respiratory assistance, IV medications, etc. that have been part of the patient’s ongoing course of treatment for an underlying disease.
Interaction with the Patient, Family, and Bystanders.

The patient always may request resuscitation even if he or she is a DNR Comfort Care patient and this protocol has been activated. The request for resuscitation amounts to a revocation of DNR Comfort Care status.

If family or bystanders request or demand resuscitation for a person for whom the DNR Comfort Care Protocol has been activated, do not proceed with resuscitation. Provide comfort measures as outlined above and try to help the family understand the dying process and the patient’s choice not to be resuscitated.

Documentation:

EMS or other health care personnel who implement the DNR Protocol for a DNR Comfort Care patient should document in their records, in accordance with the policy of their agency or facility:

- The item that identified the person as DNR Comfort Care (as listed in the Identification portion of this protocol).
- The method of verifying the person’s identity, if any was found through reasonable efforts.
- Whether the person was a DNR Comfort Care or DNR Comfort Care - Arrest patient.
- The actions taken to implement the DNR Protocol.

When a DNR Order is Current:

A DNR order for a patient of a health care facility shall be considered current in accordance with the facility’s policy. A DNR order for a patient outside a health care facility shall be considered current unless discontinued by the patient’s attending physician/CNP/CNS, or revoked by the patient. EMS personnel are not required to research whether a DNR order that appears to be current has been discontinued.
MEDICATION REFERENCE
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ACETAMINOPHEN  
(Tylenol)

CLASS:  
Analgesics (pain relievers) and antipyretics (fever reducers).

INDICATIONS:  
Acetaminophen is used for the relief of fever as well as aches and pains associated with many conditions.

CONTRAINDICATIONS:  
Known allergy and liver disease.

SIDE EFFECTS:  
When used appropriately, side effects with acetaminophen are rare. The most serious side effect is liver damage due to large doses, chronic use or concomitant use with alcohol or other drugs that also damage the liver. Chronic alcohol use may also increase the risk of stomach bleeding.

ROUTE:  
By Mouth (PO)

DOSAGE:  
The oral dose for adults is 325 to 650 mg every 4 to 6 hours. The maximum daily dose is 4 grams. The oral dose for a child is based on the child’s age, and the range is 40-650 mg (10-15mg/kg) every 4 hours.

SUPPLIED:  
Liquid suspension, chewable tablets, coated caplets, gelcaps, geltabs, and suppositories. Common dosages are 325, 500 and 650 mg.
ADENOSINE
(Adenocard)

CLASS:
Antiarrhythmic

INDICATIONS:
Paroxysmal Symptomatic Supraventricular Tachycardia (PSVT), Wolff-Parkinson-White Syndrome

NOTE: When clinically advisable, appropriate vagal maneuvers should be attempted prior to Adenosine administration

CONTRAINDICATIONS:
2nd or 3rd Degree Heart Block, Sick Sinus Syndrome, Known hypersensitivity to Adenosine

SIDE EFFECTS:
Transient Dysrhythmias, Facial Flushing, Dyspnea, Chest Pressure/Pain, Hypotension, Headache, Nausea, Bronchospasm

ROUTE:
Rapid IV or IO

DOSAGE:
Adult:
6mg, immediately followed by a 10ml Saline Flush.
12mg, immediately followed by a 10ml Saline Flush May be repeated if no response within 1-2 minutes.

Pediatric:
0.1 mg/kg & repeat every 2 minutes to a maximum dose of 12 mg

SUPPLIED:
2ml Vial @ 3mg/ml
ALBUTEROL 0.5%  
(Ventolin)

CLASS:  
Bronchodilator

INDICATIONS:  
Bronchospasm secondary to COPD or Asthma

CONTRAINDICATIONS:  
Tachydysrhythmias, Known hypersensitivity to Albuterol

SIDE EFFECTS:  
Tachydysrhythmias, Anxiety, Nausea, Ectopy, Vasodilation, Hypertension, Angina, Vomiting, Vertigo

ROUTE:  
Nebulized Aerosol

DOSAGE:  
Adult:  
2.5 mg in 3 ml Saline via nebulizer @ 6 liters/minute over 10 minutes  
Pediatric:  
1.5 mg in 3 ml Saline via nebulizer @ 6 liters/minute over 10 minutes

SUPPLIED:  
2.5mg/3ml Normal Saline Preload
ASPIRIN
Chewable Aspirin

CLASS:
Antiplatelet, Salicylate

INDICATIONS:
Chest Pain/Acute Myocardial Infarction, Angina, Avulsion, Amputation

CONTRAINDICATIONS:
Do not administer to patients with altered LOC, Known history of aspirin allergy or peptic ulcer disease, Known hypersensitivity to Aspirin

SIDE EFFECTS:
GI Bleed, Anaphylaxis, Thrombocytopenia, Reye’s Syndrome, Angioedema, Leukopenia, Hepatitis

ROUTE:
By Mouth (PO) Chewable

DOSAGE:
Adult:
AMI, Angina, Avulsion, Amputation @ 324 mg
Pediatric:
Avulsion, Amputation @ 81 mg

SUPPLIED:
81 mg tablets
**ATROPINE**  
*(Atropine Sulfate)*

**CLASS:**  
Vagolytic

**INDICATIONS:**  
Asystole, Symptomatic Bradycardia, Bradyarythmias (Junctional or escape rhythm), Organophosphate Poisoning Antidote

**CONTRAINDICATIONS:**  
Atrial Fibrillation, Atrial Flutter, Glaucoma, MI (use with caution in presence of MI), Known hypersensitivity to Atropine

**SIDE EFFECTS:**  
Blurred vision, Headache, Flushing, Dry Mouth, Tachydysrhythmias, V-Tach, V-Fib

**ROUTE:**  
IV, IO or ET

**DOSAGE:**  
**Adult:**  
Symptomatic Bradycardia - 0.5-1 mg  
Organophosphate Antidote - 2 mg every 15 minutes  

**Pediatric:**  
Symptomatic Bradycardia- 0.02 mg/kg/dose (minimum dose 0.1 mg)  
Organophosphate Antidote- 0.05 mg/kg

**SUPPLIED:**  
1mg/10ml Preload
CALCUM GLUCONATE 10%

CLASS:
   Electrolyte Solution

INDICATIONS:
   Hyperkalemia

CONTRAINDICATIONS:
   Ventricular fibrillation, Digitalis Toxicity, Hypercalcemia

SIDE EFFECTS:
   Soft tissue necrosis, Hypotension, Bradycardia (if given too rapidly).

ROUTE:
   IV

DOSAGE:
   Adult:
      10ml of Calcium Gluconate 10% (1000mg)

SUPPLIED:
   10ml of 10% solution Ampule
DEXTROSE  
(D-50)

CLASS:  
Nutrient

INDICATIONS:  
Hypoglycemia, Unresponsive with unknown etiology, Status Epilepticus

CONTRAINDICATIONS:  
CVA, Head Trauma

SIDE EFFECTS:  
Extravasations causes tissue necrosis

ROUTE:  
IV or IO

DOSAGE:  
Adult:  
25 grams (50 ml), repeat dose of 12.5 grams (25 ml)
Child:  
4 ml/kg of 10% Dextrose
Infant:  
2 ml/kg of 10% Dextrose
Neonate:  
2 ml/kg of 10% Dextrose

Mixing D10:  
Add ½ Amp of Dextrose (12.5 grams) to 100 ml 0.9% Normal Saline.

SUPPLIED:  
D-50: 50 ml Pre-load (25 GM)  
D-25 50 ml Pre-Load
DIPHENHYDRAMINE
(Benadryl)

CLASS:
Antihistamine

INDICATIONS:
Prevention or treatment of Allergic Reaction

CONTRAINDICATIONS:
Asthmatic Attack, Pregnancy, Lactating Females, Known hypersensitivity to Benadryl

SIDE EFFECTS:
CVS - Hypotension, Tachycardia, Palpitations
CNS - Drowsiness, Dizziness, Confusion, Headache, Excitement (especially Pediatrics), Seizure
OTHER - Dry Mouth, Nose and Bronchi, Blurred Vision, Nausea / Vomiting

ROUTE:
IV, IO or Deep IM Over 3 Minutes

DOSAGE:
Following Epinephrine 1:1,000 in respiratory emergencies administer:
Adult:
25 mg IV, IO or 50 mg IM slowly, may repeat in 10 minutes.
Pediatric:
1 mg/kg up to 25 mg IV or IO or IM slowly, may be repeated in 10 minutes.

SUPPLIED:
50 mg/1ml Ampule
25 mg capsule/tablet
DOPAMINE
(Intropin)

CLASS:
Inotrope: with increase heart rate effect and increase vasoconstriction.

INDICATIONS:
Cardiogenic Shock, Spinal Shock due to injury, Bradycardia

CONTRAINDICATIONS:
Tachyarrhythmias, V-Fib

**NOTE:** Do not use as the first line therapy in patients with Hypotension caused by Hypovolemia. Volume replacement must precede the use of vasopressors.

SIDE EFFECTS:
Ectopic Beats, Palpitations, Tachycardia, Nausea/Vomiting, Dyspnea, Angina, Headache, Hypertension

**NOTE:** Extravasation causes tissue necrosis

ROUTE:
Secondary IV Drip

DOSAGE:
5-20mcg/kg/min
DOPAMINE (CONT.)

SUPPLIED:
400mg/250ml D5W, (1600 mcg/ml).

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EPINEPHRINE
(Adrenalin)

CLASS:
Sympathomimetic

INDICATIONS:
Cardiac Arrest, Anaphylaxis, Asthma, Bradycardia

CONTRAINDICATIONS:
None in Cardiac Arrest of Anaphylaxis

Note: Use with caution in patients with Angina, Hypertension or Hyperthyroidism

SIDE EFFECTS:
Tachydysrhythmias, Angina, Hypertension, V-Fib, V-Tach

ROUTE:
IV or IO or ET

DOSAGE:
Adult:
Cardiac Arrest:
1st dose - 1 mg IV or IO, 1:10,000 (ET dose is 2 - 2.5 X IV dose, use 1:1000 diluted to 5 ml)
Anaphylaxis:
0.3 - 0.5 mg 1:1,000 IM, may repeat in 20 minutes

NOTE: In cases of full circulatory collapse, give 0.2 - 0.3 mg 1:10,000 IV or IO SLOWLY instead of IM

Asthma:
0.3 - 0.5 mg 1:1,000 IM

Bradycardia and Non-Traumatic Shock:
Drip at 2–10 mcg/minute
EPINEPHRINE (CONT.)

Pediatrics:

Cardiac Arrest:
0.01 mg/kg IV or IO (1:10,000: 0.1 ml/kg)
0.1 mg/kg - ET (1:1000: 0.1 ml/kg)

Anaphylaxis:
0.1 mg/kg to maximum of 0.3mg

Bradycardia:
Drip 0.1 - 1.0 mcg/kg/minute

SUPPLIED:
1:1,000 1mg/ml amp and 30mg/ml multi dose vial
1:10,000 1mg/10ml preload syringe

Mixing a Standard Drip:

1mg in 250 ml of 0.9% Normal Saline (every 2 mcg/min in 30 ml/hr)

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ETOMIDATE  
(Amidate)

CLASS:
Induction/Maintenance

INDICATIONS:
Anesthesia, Induction

CONTRAINDICATIONS:
Hypersensitivity, Caution in Elderly Patients

SIDE EFFECTS:
Transient Myoclonic, Tonic and Averting movements, Injection Site Pain, Nausea, Vomiting, Apnea

ROUTE:
IV or IO

DOSAGE:
Adult:
0.2 – 0.3 mg/kg, over 2 minutes, repeat x1 if needed

Pediatric:
0.2 – 0.3 mg/kg, over 2 minutes, repeat x1 if needed (Must get MCP order)

SUPPLIED:
1mg/ml Vial
FUROSEMIDE
(Lasix)

CLASS:
Diuretic

INDICATIONS:
Congestive Heart Failure (CHF) with Pulmonary Edema

CONTRAINDICATIONS:
Hypotension, Hypokalemia, Pregnancy

SIDE EFFECTS:
Nausea / Vomiting, Hypotension, Cardiac Dysrhythmias (2° to Potassium Depletion)

ROUTE:
IV (IV or IO in Pediatrics)

DOSAGE:
Adult:
40 mg IV (0.5 - 1 mg/kg IV)

Note: Administer no faster than 10 mg/min

Pediatric:
1 mg/kg IV or IO

SUPPLIED:
40 mg/4 ml, 10mg/10 ml
GLUCAGON
(GlucaGen)

CLASS:
Other Endocrine/Metabolic

INDICATIONS:
Hypoglycemia, severe

CONTRAINDICATIONS:
Hypersensitivity, Caution if Insulinoma or Pheochromocytoma

SIDE EFFECTS:
Hypotension, Nausea, Vomiting, Urticaria, Respiratory Distress, Hyperglycemia

ROUTE:
IM

DOSAGE:
Adult
1 mg
Pediatric
Not used per protocol, call Children's MCP for consideration of usage or dose.

SUPPLIED:
1mg/ml Vial
GLUTOSE
(Oral Glucose Gel)

CLASS:
Other Endocrine/Metabolic

INDICATIONS:
Hypoglycemia before unconsciousness

CONTRAINDICATIONS:
Hypersensitivity, Unconscious Patients, Patients unable to swallow

SIDE EFFECTS:
Nausea, Vomiting, Urticaria, Hyperglycemia

ROUTE:
Oral

DOSAGE:
Adult:
15 grams (entire contents of 37.5 gram tube)

SUPPLIED:
15 grams/squeeze tube
IPRATROPIUM BROMIDE
(Atrovent)

CLASS:
Anticholinergic Bronchodilator

INDICATIONS:
Asthma; after one (1) Nebulized Albuterol, Acute COPD Exacerbation; after one (1) Nebulized Albuterol

CONTRAINDICATIONS:
Caution in pregnancy, Known hypersensitivity to Atrovent or Atropine or its derivatives

SIDE EFFECTS:
Worsening of Narrow-angle Glaucoma (may increase eye pain), Tachycardia, Dyspnea, Palpitations, Allergic Reactions

ROUTE:
Nebulized Inhalation

DOSAGE:
Adult:
After 1st Albuterol dose: Mix 2.5 ml Atrovent with 2.5 ml Albuterol Nebulized

Pediatric:
After 1st Albuterol dose: Mix 2.5 ml Atrovent with 2.5 ml Albuterol Nebulized

SUPPLIED:
1.6 ml Vial
LIDOCAINE
(Xylocaine)

CLASS:
Antiarrhythmic (Class IB)

INDICATIONS:
Symptomatic PVC’s (Unifocal @ > 6 / minute, Multifocal, R on T, Salvos), V-Tach, Wide Complex Tachycardia, PSVT, Cardiac Arrest, suspect increase ICP

CONTRAINDICATIONS:
Bradycardia with or without PVC’s, 2nd or 3rd Degree AV Block, Idioventricular Rhythm, Known Allergy to Lidocaine, Known Allergy to Local Anesthetics

SIDE EFFECTS:
Fall in Cardiac Output, Numbness, Drowsiness, Confusion, Seizures

ROUTE:
IV, IO or ET (ET dose is 2 – 2.5 times the IV Dose).

DOSAGE:
Adult:
Cardiac Arrest: 1 - 1.5 mg/kg, repeat at 0.5-0.75 mg/kg every 3 - 5 minutes to a maximum of 3 mg/kg.
PVC’s: 1 - 1.5 mg/kg, repeat at 0.5-0.75 mg/kg every 5 - 10 minutes until ectopy abated or to a maximum of 3 mg/kg
Suspect increased ICP when intubating: One time dose of 100mg IV
Drip: Following Bolus of Lidocaine with dysrhythmia conversion start drip by using pre-mixed Lidocaine (2 g / 500 ml).

After:
1 mg / kg Bolus - 2 mg/minute
1 - 2 mg / kg Bolus - 3 mg/minute
2 - 3 mg / kg Bolus - 4 mg/minute

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LIDOCAINE (CONT.)

Pediatric:

**Cardiac Arrest:** 1 mg / kg IV, IO or ET, Every 3 - 5 minutes to a maximum of 3 mg/ kg

**Drip:** Following IV or ET Bolus of Lidocaine with dysrhythmia conversion start drip by following Rule-of-6's:

- **Step 1** - The patient's weight in Kg X 6 = Z
- **Step 2** - Add that amount (Z in mg) to 0.9% Normal Saline to equal 100ml
- **Step 3** - Infuse at 2 - 5 ml / hour to provide:
  
  20 - 50 mcg / kg / minute (20 - 50 gtts/minute)

**SUPPLIED:**

- IV = 100mg/5ml preload syringe
- DRIP = 2g/500ml D5W Premix Solution
LORAZEPAM
(Ativan)

CLASS:
Benzodiazepine

INDICATIONS:
Status Epilepticus, Pre-Cardioversion Sedation

CONTRAINDICATIONS:
Known hypersensitivity to Benzodiazepines, Acute Narrow-Angle Glaucoma, Sleep Apnea Syndrome, Specific Overdose (cocaine, crystal meth, bath salts)

SIDE EFFECTS:
Respiratory Depression, Paradoxical Reactions, i.e.: Irritability, Restlessness, Agitation, Aggression, Hostility, Rage

ROUTE:
Slow IV, IO or Deep IM

DOSAGE:
Adult:
Seizure: 1 - 2 mg, Diluted 1:1 with 0.9% Normal Saline, every 10 – 15 Minutes to a maximum dose of 10 mg.
Sedation: 1 mg, Diluted 1:1 with 0.9% Normal Saline, every 5 minutes to a maximum dose of 5 mg.

Pediatric:
0.05 mg/kg, Diluted 1:1 with 0.9% Normal Saline, every 10 – 15 minutes to a maximum dose of 2.5 mg.

SUPPLIED:
2 mg/ml, 1ml Vial

NOTE: IV OR IO DOSE MUST BE AT LEAST DILUTED 1:1 WITH 0.9% Normal Saline
MIDAZOLAM
(Versed)

CLASS:
Sedative

INDICATIONS:
Sedation for medical patients prior to: Intubation, Cardioversion, TCP (Pacing), Shivering following induced hypothermia post-arrest, Specific Overdose (cocaine, crystal meth, bath salts)

CONTRAINDICATIONS:
Pregnancy, Nursing Mothers, Narrow Angle Glaucoma

PRECAUTIONS:
Reduce dose by 50% in elderly and titrate to effect

SIDE EFFECTS:
Respiratory Depression, Hypoxia, Apnea, Decreased Tidal Volume, Fluctuations in Vital Signs, Hypotension, Dysrhythmias

NOTE: May give in 0.5 mg increments titrated to effect
- Effects should be seen in 1 - 2 minutes
- High incidence of partial or complete amnesia
- May be diluted in 0.9% Normal Saline

ROUTE:
Slow IV or IO,

DOSAGE:
Adult:
2 - 5 mg IV SLOWLY over 1 - 2 minutes OR via MAD (1 ml per nare) to a maximum of 10 mg, may repeat every 5 minutes

Pediatrics:
0.1 mg / kg IV or IO SLOWLY over 1-2 minutes to a maximum of 0.2 mg / Kg

SUPPLIED:
2mg/2ml Ampule
MORPHINE SULFATE

CLASS:
Opiate Agonist

INDICATIONS:
Severe Pain: Isolated Extremity Trauma, Burns, AMI, Acute Pulmonary Edema, Anxiety

CONTRAINDICATIONS:
Significant Hypotension, Multisystem Trauma, Known Allergic Reaction

SIDE EFFECTS:
Hypotension, Bradycardia, Nausea / Vomiting, Respiratory Depression

ROUTE:
IV, IM

DOSAGE:
Adult:
- **Pain control**: 2-5 mg IV, repeat every 5 minutes if systolic BP is above 90, max of 20 mg.
- **Aortic Aneurysm, CHF, Acute Pulmonary Edema**: 2 mg every 5 minutes to a maximum of 20 mg

Pediatric:
- 0.1 mg/kg over 2 - 5 minutes, maximum dose 2 mg, may repeat x 5, every 5-10 minutes

**NOTE**: Antidote is 2 mg Naloxone (Narcan)

SUPPLIED:
10mg /1ml
NALOXONE
(Narcan)

CLASS:
Narcotic Antagonist

INDICATIONS:
Known or Suspected Narcotic Overdose, Unresponsive for unknown reason

CONTRAINDICATIONS:
None

SIDE EFFECTS:
Projectile Vomiting, Dysrhythmias, Seizures (Possible Opiate Addiction Withdrawal Symptom)

ROUTE:
Slow IV, IO or IM, may be given IN (MAD)

DOSAGE:
Adult:
0.4 - 2 mg SLOWLY repeat in 5 minutes if partial response noted

Pediatric:
0.1 mg / kg SLOWLY to a maximum of 0.8 mg

SUPPLIED:
4mg/10ml multi dose vial, 2mg/ml dose ample, 0.4mg/ml dose ample
NITROGLYCERINE

CLASS:
Vasodilator

INDICATIONS:
Acute Angina Pectoris, CHF (Congestive Heart Failure), Chest Pain

CONTRAINDICATIONS:
Use with Caution in MI, ICP (Increased Intracranial Pressure), Glaucoma, Hypotension (BP<90mm/Hg Systolic)

Any patient that has used erectile dysfunction medication in the last 72 hours Nitroglycerine should be avoided or used with extreme caution.

SIDE EFFECTS:
Transient Throbbing Headaches, Hypotension, Dizziness, Weakness

ROUTE:
Sublingual

DOSAGE:
0.4 mg repeat every 2-5 minutes if Systolic BP remains > 90 mm/Hg

SUPPLIED:
Multi-dose bottle (0.4mg per tablet)
Multi-dose aerosol spray bottle (0.4mg per spray)
ONDANSETRON  
(Zofran)

CLASS:  
Blocking agent of serotonin (antagonist), Antiemetic

INDICATIONS:  
Severe Nausea and Vomiting

CONTRAINDICATIONS:  
No severe contraindication

SIDE EFFECTS:  
Dizziness, Musculoskeletal pain, Drowsiness/sedation, Shivers 38, Malaise/fatigue, Chest pain (unspecified), Anxiety/agitation, Hypotension, Fever, Cold sensation, Paresthesia, sites of pain included abdomen, stomach, joints, rib cage, shoulder.

ROUTE:  
IV, IO or IM may be given as Sublingual Tab

DOSAGE:  
Adult:  
4 mg, Repeat in 10-15 minutes if needed to a maximum dose of 8 mg  
Pediatric:  
Children 2 -12 years - 0.1mg/kg to max of 4 mg, repeat 15-30 minutes

SUPPLIED:  
4 mg vial  
4 mg tablet
OXYGEN

CLASS:
   Medical Gas

INDICATIONS:
   Shortness of breath, trauma, medical emergencies

CONTRAINDICATIONS:
   Watch COPD patients for Respiratory compromise with amounts of oxygen above 6 LPM

SIDE EFFECTS:
   Respiratory depression with COPD Patients

ROUTE:
   Inhaled

DOSAGE:
   2 - 6 LPM via Nasal Cannula
   10 - 15 LPM via Non-Rebreather
   15 LPM or greater via Bag Valve Mask
   6 LPM via nebulizer
   15 LPM for CPAP mask

SUPPLIED:
   C, D, E, M or H tanks
**SODIUM BICARBONATE**

**CLASS:**
Alkalinizing agent, antacid, electrolyte

**INDICATIONS:**
Acute mild to moderate metabolic acidosis due to shock, Severe dehydration, Anoxia, cardiac arrest, Severe primary lactic acidosis, tricyclic antidepressants overdose, Hyperkalemia in Renal patients

**CONTRAINDICATIONS:**
Hypertension, convulsions, CHF, and other situations where administration of sodium can be dangerous

**SIDE EFFECTS:**
None in the Emergency Setting

**ROUTE:**
IV or IO

**DOSAGE:**

**Adult:**
1 mEq/kg IV, Repeat @ 0.5 mEq/kg IV Q 10 minutes in Cardiac Arrest

**Pediatric:**
1 mEq/kg (4.2% ) IV, Repeat @ 0.5 mEq/kg IV Q 10 minutes in Cardiac Arrest

**SUPPLIED:**
Adult - 8.4% (50meq in 50ml)
Pediatric - 4.2% (5meq in 10ml)
Pediatric Medications
### PEDIATRIC PREHOSPITAL MEDICATIONS

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenosine</td>
<td>0.1 mg/kg</td>
<td>IV, IO</td>
<td>Indicated for SVT, May double second; Max 6mg (1&lt;sup&gt;st&lt;/sup&gt;) or 12 mg (2&lt;sup&gt;nd&lt;/sup&gt;) dose.</td>
</tr>
<tr>
<td>Albuterol</td>
<td>2.5 mg/3ml</td>
<td>Aerosol</td>
<td>Indicated for wheezing as per protocol.</td>
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<tr>
<td></td>
<td>Neb</td>
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<tr>
<td>Aspirin</td>
<td>81 mg</td>
<td>PO</td>
<td>Avulsion/Amputations</td>
</tr>
<tr>
<td>Ativan</td>
<td>0.05 - 0.1 mg/kg</td>
<td>IV, IO</td>
<td>Indicated for uncontrolled seizure activity, anticipate respiratory depression. Max. dose 4 mg.</td>
</tr>
<tr>
<td>Atropine</td>
<td>0.02 mg/kg</td>
<td>IV, IO, ET</td>
<td>Minimum dose 0.1 mg; max dose for child 0.5 mg; max dose for adolescent 1 mg; may repeat x 1.</td>
</tr>
<tr>
<td>Atrovent</td>
<td>0.5 mg/2.5 ml</td>
<td>Aerosol</td>
<td>After 1&lt;sup&gt;st&lt;/sup&gt; Albuterol; Mix 0.5 mg (2.5 ml) Atrovent with 2.5 mg (3 ml) Albuterol</td>
</tr>
<tr>
<td>Benadryl (diphenydramine)</td>
<td>1 – 2 mg/kg</td>
<td>IV, IM</td>
<td>Maximum dose of 50mg.</td>
</tr>
<tr>
<td>Bicarbonate 4.2%</td>
<td>1 mEq/kg</td>
<td>IV, IO</td>
<td>Treatment of acidosis due to cardiac arrest.</td>
</tr>
<tr>
<td>Dextrose 10%</td>
<td>2 - 4 ml/kg</td>
<td>IV, IO</td>
<td>Try to obtain bedside glucose level before administering - administer if blood glucose &lt; 60 mg/dL.</td>
</tr>
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<tr>
<td>Epinephrine (1:10,000)</td>
<td>0.01 mg/kg</td>
<td>IV, IO</td>
<td>Commonly used in cardiac arrest (1:10,000) (0.1 ml/kg) rhythms as first dose. May repeat every 3-5 min.</td>
</tr>
<tr>
<td>Epinephrine (1:1000)</td>
<td>0.1 mg/kg (0.1 ml/kg)</td>
<td>ET</td>
<td>Commonly used in cardiac arrest rhythms. The ET route has limited absorption, thus, the ET dose (first and subsequent) is 10 X greater than the IV or IO route. May repeat every 3-5 min.</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>1 mg/kg</td>
<td>IV, IO, ET</td>
<td>Max dose 100 mg. If successful start continuous infusion at 20-50 mcg/kg/min. Repeat bolus if infusion not started within 15 min.</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>2-3 mg/kg</td>
<td>ET</td>
<td>Flush with 5 ml of 0.9% Normal Saline and follow with 5 assisted manual ventilations</td>
</tr>
<tr>
<td>Midazolam (Versed)</td>
<td>0.05 - 0.15 mg/kg</td>
<td>IV, IO</td>
<td>May repeat in 5 minutes. Max total dose = 10 mg. Anticipate respiratory depression.</td>
</tr>
<tr>
<td>Morphine</td>
<td>0.1 mg/kg</td>
<td>IV, IO</td>
<td>Max dose of 2 mg. May repeat X 5 every 5 – 10 minutes. Anticipate respiratory depression.</td>
</tr>
<tr>
<td>Narcan (naloxone)</td>
<td>0.1 mg/kg</td>
<td>IV, IO, ET</td>
<td>Maximum dose 2 mg. Use lower doses (0.001-0.015 mg/kg) to reverse respiratory depression associated with chronic opioid use.</td>
</tr>
<tr>
<td>Ondansetron (Zofran)</td>
<td>0.15 mg/kg</td>
<td>IV, IO</td>
<td>Used in children 2 - 12 years may repeat in 15 - 30 minutes with maximum dose 4 mg. Children older than 12, use adult dosage.</td>
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</tbody>
</table>