WeShare Paramedic Protocols

This protocol has been adopted by the WeShare Committee and approved by the following medical control physicians:

______________________	______________________	______________________
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Effective May 1, 2007

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All patients with possible acute coronary syndrome should be treated calmly and evaluated carefully for possible myocardial infarction. It is important to make the patient comfortable, provide reassurance, and help relieve pain. Try to determine the onset of symptoms and ask the patient to locate and describe the pain. Mid-sternal chest pain that radiates to the neck, jaw, shoulder and/or arm or any combination should raise suspicion. Pain that is described as squeezing, tightness, fullness, or pressure may be indicative of an MI. Remember that females may not have the same symptoms as males; symptoms may be more vague, less severe, or non-existent. Diabetics and the elderly may also present without chest pain.

Treatment

1. Manage the airway and begin administering O_2 4-6 lpm via nasal cannula. Increase via NRB if needed.
2. Apply pulse oximeter and obtain baseline vitals
3. Apply cardiac monitor, obtain 12 lead EKG and transmit via telemetry or give to physician or nurse upon arrival. DO NOT SIGNIFICANTLY DELAY TRANSPORT TO OBTAIN
4. Start IV NS TKO
5. Administer 2 baby aspirin by mouth if no history of aspirin allergy, active peptic ulcer, GI bleeding, or renal failure
6. If patient is conscious and alert, administer 0.4 mg nitroglycerin SL or spray. May repeat in 5 minutes up to 3 doses if pain does not subside and systolic BP is above 90.
7. Re-evaluate patient. If pain remains severe, patient is alert and systolic BP >90, administer morphine sulfate 2-4mg slow IV push q5 minutes as needed to a maximum of 10mg. Document vitals every 5 minutes
8. If patient is hypotensive with signs and symptoms of shock (BP <90 with poor perfusion) give 250cc bolus NS unless pulmonary congestion
9. Correct arrhythmias- see appropriate protocols
10. Transport

Use nitro with caution in patients with COPD or volume depletion. Contraindicated if any erectile dysfunction meds have been taken in the last 36 hours

1. Manage airway and administer 100% O_2 via NRB. Apply pulse oximeter and treat accordingly. Be prepared to assist ventilations and intubate as needed.
2. Make patient comfortable and provide reassurance
3. Evaluate patient's general appearance and obtain history:
    a. OPQRST-I
    b. SAMPLE
4. Apply cardiac monitor and interpret rhythm (sinus bradycardia, 2nd degree Mobitz I or Mobitz II, or 3rd degree block[1])
5. Start IV NS TKO or saline lock
6. Transport if patient is asymptomatic and stable
7. If patient is symptomatic[2], administer Atropine 0.5mg IVP. If rate increases significantly but remains <60, administer additional doses @0.5mg IV push every 5 minutes to a maximum of 3mg (or 0.4mg/kg) or until heart rate is >60 and patient's SBP >90.
8. If no significant improvement after 1-2 doses, apply external pacemaker and begin pacing at 80 beats per minute and 60 milliamps. Increase in 20 milliamp increments until capture is achieved.
9. Contact Med Control and transport

Bradycardia- rate less than 60 beats per minute

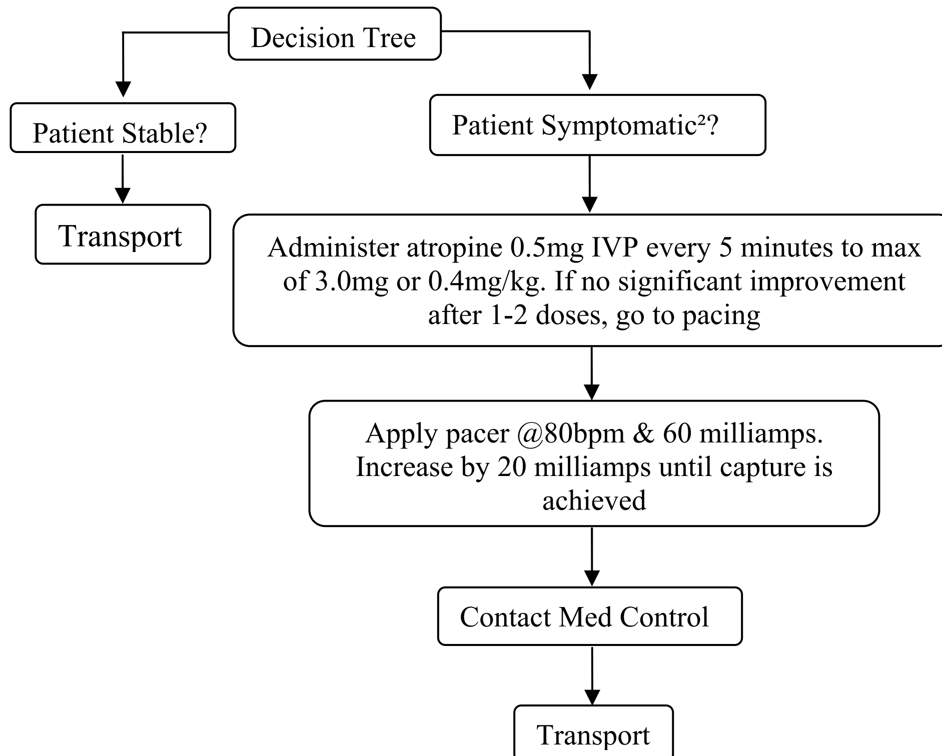
Consider having pacer pads ready if condition deteriorates

[1]Atropine may be harmful in complete heart block. Begin pacing immediately

[2]Change in mental status, hypotension, CP, and/or SOB

Be prepared to apply pacer pads during Atropine administration

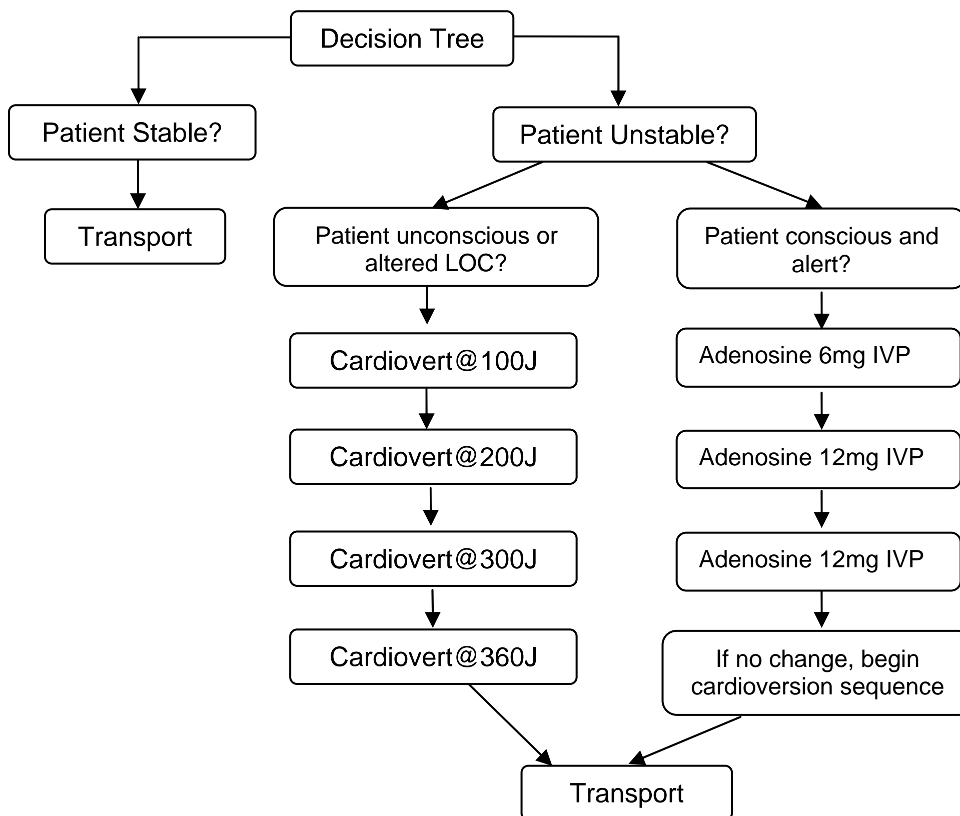
Contact Med Control for orders for IV Valium or Morphine if patient is not tolerating pacing due to external pain. Use caution if hypotensive



Atropine may be harmful in complete heart block. Begin pacing immediately

Supraventricular Tachycardias

1. Manage airway and administer 100% O_2 via NRB. Apply pulse oximeter and treat accordingly. Be prepared to assist ventilations and intubate as needed.
2. Make patient comfortable and provide reassurance
3. Evaluate patient's general appearance and obtain history:
   a. OPQRST-I
   b. SAMPLE
4. Apply cardiac monitor and interpret rhythm
5. Start IV NS TKO or saline lock
6. Transport if patient is asymptomatic and stable
7. If the patient is unstable, unconscious, or has an altered level of consciousness with poor perfusion, begin immediate synchronous cardioversion:
   a. Cardiovert @100 joules
   b. Cardiovert @200 joules
   c. Cardiovert @300 joules
   d. Cardiovert @360 joules
8. If patient is alert and oriented but otherwise unstable:
   a. Attempt vagal maneuvers (valsalva, cough)
   b. Administer Adenosine 6mg rapid IV push (<2 sec.) followed by 20cc rapid saline bolus
   c. If no conversion, administer Adenosine 12mg rapid IV push (as above)
   d. If no conversion, administer another 12 mg rapid IV push (as above)
   e. If still no response, begin cardioversion sequence as above
9. Transport- contact Med Control for further orders



Narrow complex SVT rate is 150-250

Unstable- hypotensive/chest pain/short of breath/altered LOC

Consider sedation- Valium 5mg slow IV push (contact Med Control)

Check rhythm between shocks

Frequent PVC's

1. Manage airway and administer 100% O_2 via NRB. Apply pulse oximeter and treat accordingly. Be prepared to assist ventilations and intubate as needed.
2. Evaluate patient's general appearance and obtain history.
3. Apply cardiac monitor and interpret rhythm
4. Start IV NS TKO or saline lock
5. Determine if any of the following malignant conditions are present:
    a. Associated chest pain
    b. Multi-focal PVC's
    c. More than 6 PVC's per minute
    d. R on T phenomenon
    e. Couplets or runs of ventricular tachycardia
6. If the patient does not have any malignant symptoms mentioned above, begin transport.
7. If any malignant symptoms are present, treat underlying causes such as hypoxia, hypoperfusion, etc.
8. Contact Med Control to request Lidocaine bolus @1.0-1.5mg/kg IVP (75-100mg).
9. Initiate transport after first dose of Lidocaine.
10. If no response, repeat Lidocaine bolus @0.5-0.75mg/kg every 5-10 minutes to a maximum of 3 mg/kg maximum.
11. If patient converts during treatment, repeat Lidocaine @50mg every 20 minutes.

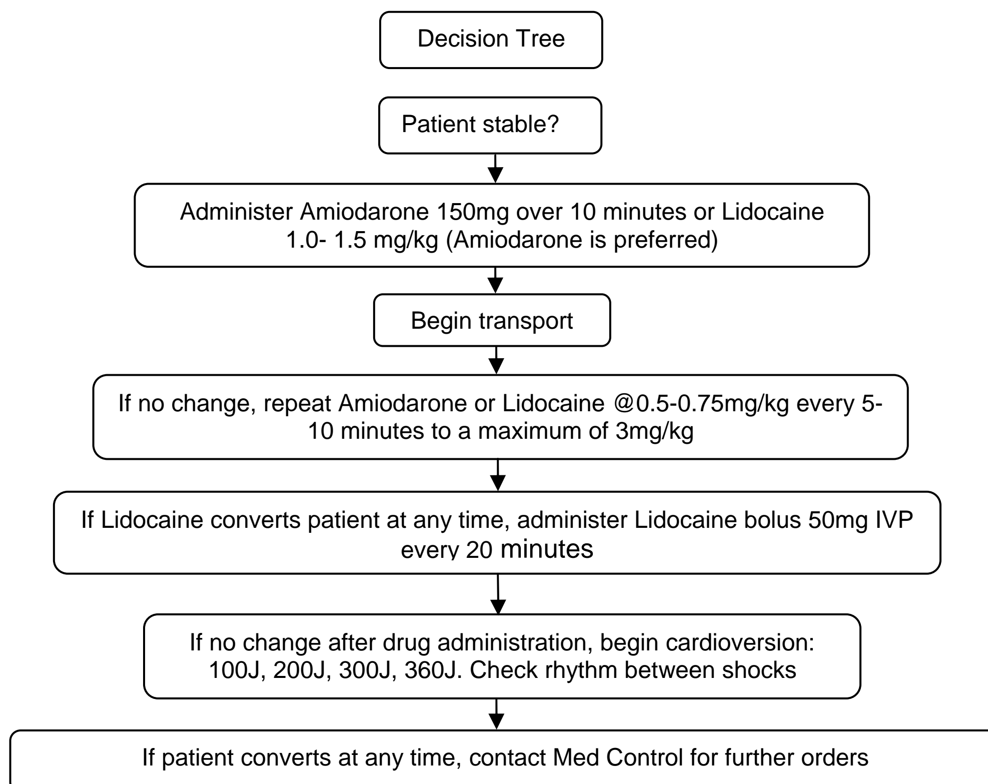
If ordered by Med Control ONLY

Treatment

1. Manage airway and administer O_2 as needed. Apply pulse oximeter and treat accordingly.
2. Evaluate patient's general condition and obtain history.
3. Apply cardiac monitor and interpret rhythm.
4. If rhythm is sinus tachycardia (rate 100-150, regular with P waves, normal P-R interval and QRS), treat underlying cause(s) such as:
   - Hypoxia
   - Hypovolemia
   - Dehydration
   - Fever
   - Anxiety
5. Transport

Ventricular Tachycardia- Stable

1. Manage airway and administer 100% O_2 via NRB. Apply pulse oximeter and treat accordingly. Be prepared to assist ventilations and intubate as needed.
2. Make patient comfortable and provide reassurance.
3. Evaluate patient's general appearance and obtain history:
   a. OPQRST-I
   b. SAMPLE
4. Apply cardiac monitor and interpret rhythm.
5. Start IV NS TKO or saline lock.
6. If patient is stable, administer Amiodarone 150 mg over 10 minutes (150 mg in 100cc NS @ 90 gtts./ min) or Lidocaine bolus @1.0-1.5 mg/kg (75-100 mg) IV
7. Initiate transport after first dose of Amiodarone or Lidocaine
8. If no improvement, repeat Amiodarone as above or Lidocaine bolus @0.5-0.75mg/kg every 5-10 minutes to a maximum of 3 mg/kg.
9. If Lidocaine has been given and the patient converts at any time during treatment, give Lidocaine bolus @50mg every 20 minutes.
10. If no change after Amiodarone or Lidocaine administration and patient remains stable, contact Med Control for ***possible*** cardioversion:
    a. Cardiovert @100 joules
    b. Cardiovert @200 joules
    c. Cardiovert @300 joules
    d. Cardiovert @360 joules
11. If patient converts at any time during cardioversion, contact Med Control for further orders
12. Continue rapid transport



If patient becomes unstable, go to unstable ventricular tachycardia algorithm. If patient becomes pulseless, go to VF/pulseless V Tachycardia algorithm

Amiodarone is preferred.

Stay with the same drug

Contact Med Control

Consider sedation with Valium 5mg IV bolus

Check rhythm between shocks

Stay with the same drug

Ventricular Tachycardia- Unstable

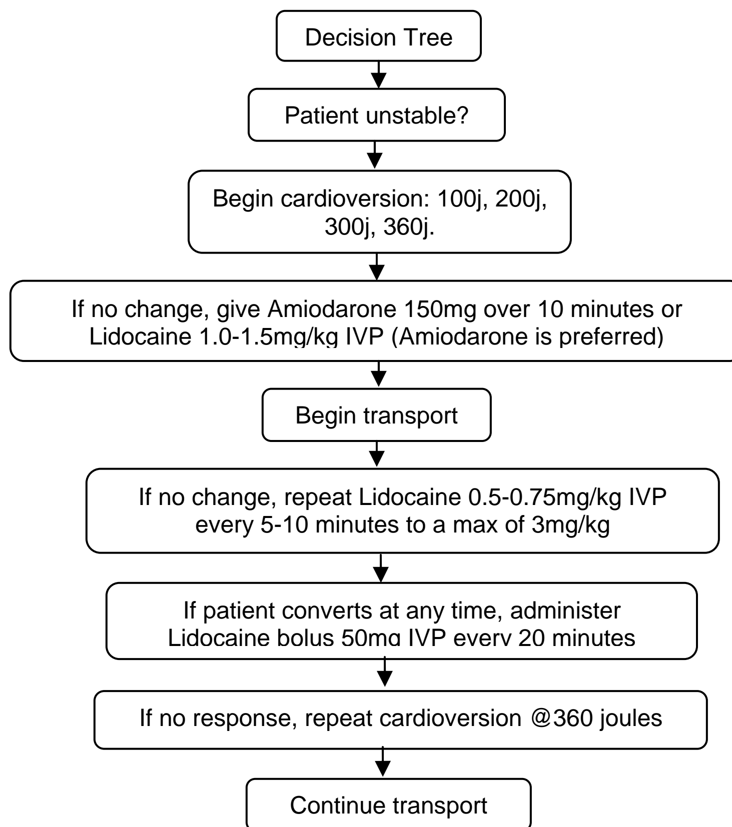
1. Manage airway and administer 100% O_2 via NRB. Apply pulse oximeter and treat accordingly. Be prepared to assist ventilations and intubate as needed.
2. Make patient comfortable and provide reassurance.
3. Evaluate patient's general appearance and obtain history.
4. Apply cardiac monitor and interpret rhythm.
5. Start IV NS TKO.
6. If patient is unstable, begin synchronous cardioversion:
   a. Cardiovert @100 joules
   b. Cardiovert @200 joules
   c. Cardiovert @300 joules
   d. Cardiovert @360 joules
7. If no change, administer Amiodarone 150mg IV over 10 minutes (150 mg in 100cc NS @ 90 gtts./ min) or Lidocaine 1.0-1.5mg/kg IV push (75-100mg)
8. Begin transport after initiating Amiodarone or first dose of Lidocaine
9. If no response, repeat Lidocaine 0.5-0.75mg/kg IV push every 5-10 minutes to a maximum of 3mg/kg.
10. If the patient converts at any time during treatment, administer Lidocaine bolus 50mg IV push every 20 minutes.
11. If no response, repeat synchronous cardioversion:
    a. Cardiovert @360 joules
12. Continue rapid transport

Unstable- hypotensive, chest pain, short of breath, and/or altered LOC

Consider sedation with Valium 5mg slow IV bolus (contact Med Control)

Amiodarone is preferred

If patient becomes unconscious w/o pulse, treat as ventricular fibrillation



General Guidelines

- CPR should not be interrupted for more than 15 seconds during cardiac arrest until a spontaneous pulse returns.
- If an IV cannot be established, all ACLS drugs may be administered IO or through the endotracheal tube.
- On arrival, if a patient is in ventricular fibrillation, down time exceeds 4-5 minutes and no CPR has been performed, provide 2 minutes of quality CPR before attempting defibrillation.
- Attempts at defibrillation should follow the sequence- shock, 2 minutes CPR, shock.
- Begin BVM ventilation if there is no normal breathing (i.e., agonal respirations).
- Compression to ventilation ratio is 30:2 for adults and 15:2 for infants and children. Once an airway is secured, perform continuous compressions and ventilate 6-8 times per minute
- Check for DNR-CC/Arrest orders, if readily available, while instituting resuscitative measures.

IO is preferred over ETT

Ventricular Fibrillation

1. Assess ABC's. Begin quality CPR until defibrillator is available.
2. If monitor indicates ventricular fibrillation or pulseless ventricular tachycardia, defibrillate @ 360 joules monophasic or 150-200 joules biphasic.
3. Check pulse. If patient is unresponsive, intubate, start IV NS, and continue CPR.
4. If no change, administer 1 mg epinephrine 1:10,000 IV push every 3-5 minutes during arrest
5. Continue CPR to circulate drugs.
6. If no change, defibrillate @ 360 joules monophasic or 150-200 joules biphasic (or manufacturer's recommendation for biphasic).
7. Reassess. If no pulse, administer Amiodarone (Cordarone) 300mg IV push. If unable to use Amiodarone, give Lidocaine 1.5mg/kg IV push. Lidocaine may be repeated in 5 minutes to a maximum of 3mg/kg.
8. Continue CPR to circulate drugs
9. If no change, repeat defibrillation as above in step 6
10. Reassess. If no pulse, administer Amiodarone 150mg IV push. May repeat in 3-5 minutes after initial dose. Contact Med Control for additional dosing
11. Continue CPR to circulate drugs
12. If no change, repeat defibrillation as above in step 6
13. Consider sodium bicarbonate @1mEq/kg IV push.
14. Transport. Continue 2 minutes of quality CPR between defibrillation attempts.

Note: If pulse returns, contact receiving hospital for further orders. Refer to other arrhythmia protocols if indicated.

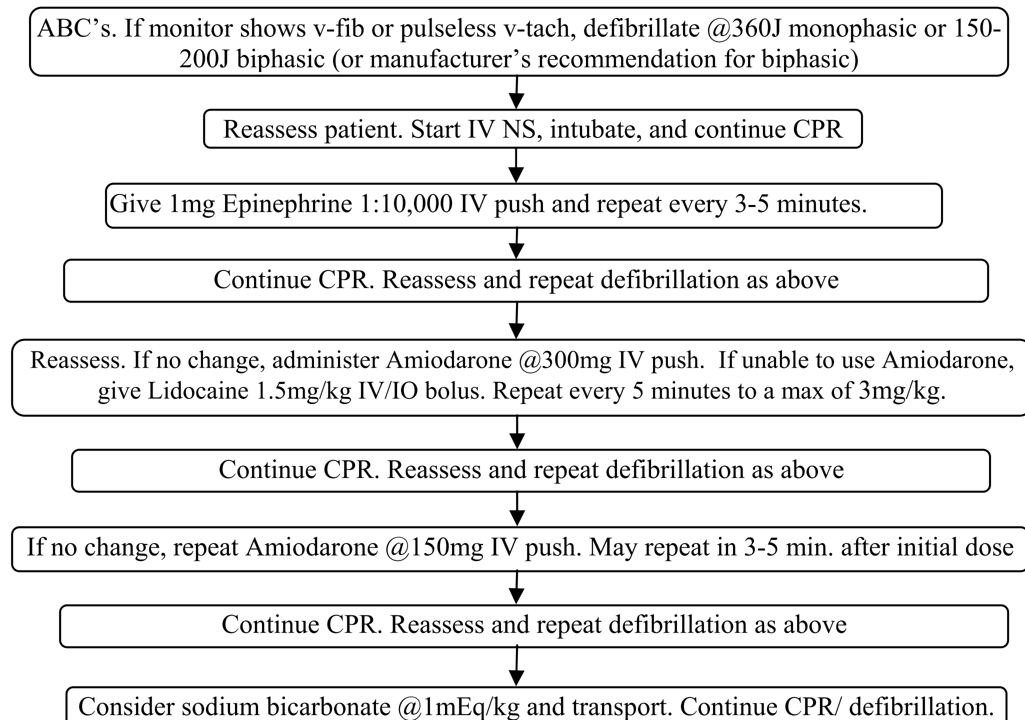
If down time exceeds 4-5 minutes and no CPR has been performed, provide 2 minutes of quality CPR before defibrillation attempts

Amiodarone is the <u>first choice</u> drug

NOTE: If unable to start an IV, all ACLS drugs can also be given IO

Sodium bicarb is questionable in cardiac arrest. See drug sheet

If patient converted with Lidocaine, give Lidocaine 50mg bolus every 20 minutes (3mg/kg max)



NOTE: If unable to start an IV, all ACLS drugs can also be given IO

Contact Med Control for additional dosing

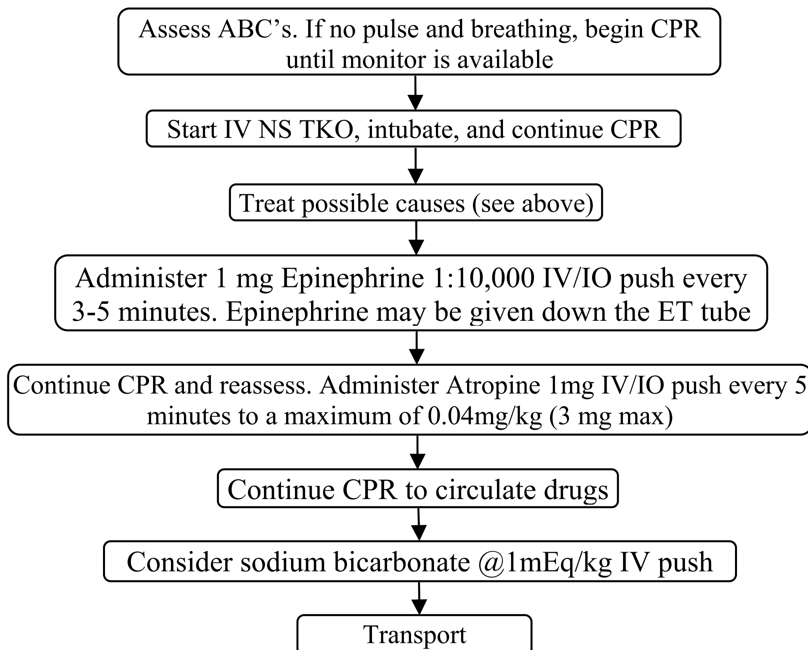
Asystole

1. Assess ABC's. If no pulse and breathing, begin CPR until monitor is available.
2. Start IV NS TKO, intubate, and continue CPR.
3. If monitor indicates asystole, treat possible causes of asystole including:

H's	T's
Hypovolemia	Toxins
Hypoxia	Tamponade (cardiac)
Hydrogen Ion (acidosis)	Tension Pneumothorax
Hyper/ hypokalemia	Thrombosis (coronary or pulmonary)
Hypoglycemia	Trauma
Hypothermia	

4. Administer 1 mg Epinephrine 1:10,000 IV or IO push every 3-5 minutes.
5. Continue CPR to circulate drugs.
6. Reassess. Administer 1 mg Atropine IV/IO push every 5 minutes to a maximum of 0.04mg/kg (3mg max).
7. Continue CPR to circulate drugs.
8. Consider sodium bicarbonate @1mEq/kg IV push.
9. Transport

Sodium bicarb is questionable in cardiac arrest. See drug sheet



NOTE: If unable to start an IV, all ACLS drugs can also be given IO

Pulseless Electrical Activity (PEA)

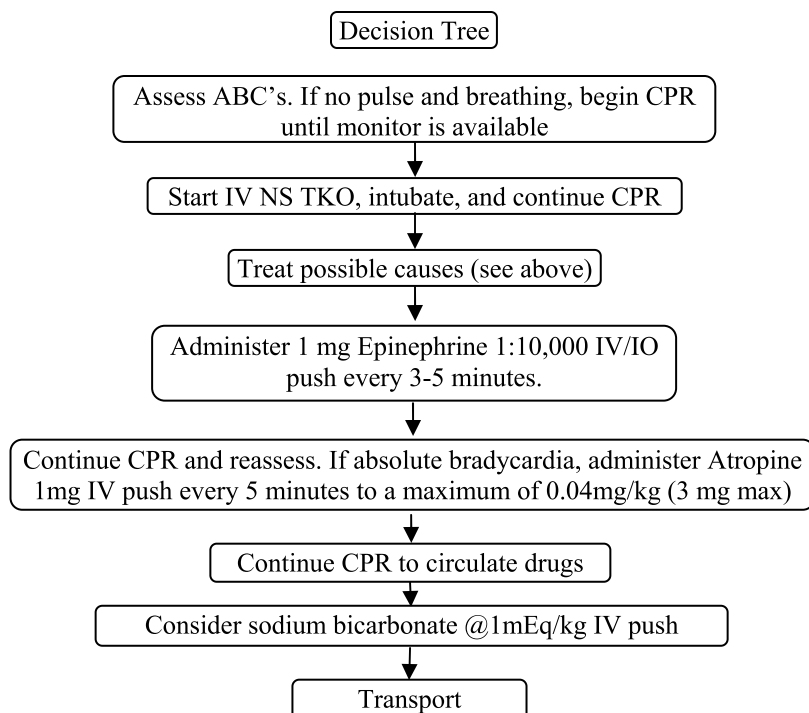
1. Assess ABC's. If no pulse and breathing, begin CPR until monitor is available.
2. Start IV NS TKO, intubate, and continue CPR.
3. If monitor indicates PEA, treat possible causes of PEA including:

H's	T's
Hypovolemia	Toxins
Hypoxia	Tamponade (cardiac)
Hydrogen Ion (acidosis)	Tension Pneumothorax
Hyper/ hypokalemia	Thrombosis (coronary or pulmonary)
Hypoglycemia	Trauma
Hypothermia	

+Drug overdoses such as tricyclics, digitalis, beta blockers, calcium channel blockers

4. Administer 1 mg Epinephrine 1:10,000 IV or IO push every 3-5 minutes.
5. Continue CPR to circulate drugs.
6. Reassess. If absolute bradycardia (rate <60), administer 1 mg Atropine IV push every 5 minutes to a maximum of 0.04mg/kg (3mg max).
7. Continue CPR to circulate drugs.
8. Consider sodium bicarbonate @1mEq/kg IV push.
9. Transport

Sodium bicarb is questionable in cardiac arrest. See drug sheet



NOTE: If unable to start an IV, all ACLS drugs can also be given IO

General Considerations:

It is important to remember that burn injuries can compromise the skin, the body's protective envelope, affecting other body systems and causing massive fluid shifts and infection. When assessing the severity of the burn, determine the extent of the body surface area affected by using the rule of nines and give special consideration to any respiratory, joint, hand, foot or circumferential regions. Additional consideration should be given to pediatric and geriatric patients, and those who are ill or have other traumatic injuries. Determine whether the burn is superficial, partial thickness, or full thickness (1st degree, 2nd degree, or 3rd degree). If the patient's condition warrants, institute aggressive care. Secure the airway ASAP by appropriate means and initiate IV therapy and fluid replacement.

General Treatment Guidelines:

- The first priority is to assure scene safety and removal of the patient from heat, flame, electrical, radiation, and chemical exposure.
- Airway, breathing, and circulation must be stabilized before burn treatment begins.
- Patients with extensive burns must be monitored for hypothermia.
- For extensive burns, stop the burning process by the appropriate means and cover the burn area with dry, sterile dressings to avoid hypothermia.
- Remember to:
  - Stop the burning process
  - Reduce the pain
  - Prevent contamination
  - Monitor for signs and symptoms of smoke inhalation
- When dealing with contaminated environments, contact Westshore Hazmat immediately.
- For critical burns, contact Med Control ASAP to advise of the patient's condition.

Treatment:

1. Secure the airway and provide 100% O_2 via NRB or BVM and intubate as necessary. Use a pulse oximeter but consider that the patient may have been in high CO environment.
2. Determine the type of burn and treat as follows:
   a. Thermal Burns (dry and moist)
      i. Stop the burning process, i.e., remove the patient from the heat source, cool the skin, and remove clothing
      ii. If the patient begins to shiver or skin is cool, stop the cooling process
      iii. Estimate the extent and depth of the burn
      iv. Cover the burn areas with DRY, STERILE dressings
      v. Contact Med Control to advise and transport accordingly

b. Radiation Burns
   i. Treat as thermal burns except when burn is contaminated with a radioactive source. If a radioactive source is present, treat as a chemical burn
   ii. Wear appropriate protective clothing when dealing with contamination
   iii. Contact the Westshore Hazmat Team

c. Chemical Burns
   i. Contact the Westshore Hazmat Team for assistance
   ii. Wear appropriate protective clothing
   iii. Remove the patient from the contaminated area to a decontamination site- ***not the squad***.
   iv. Try to determine the chemicals involved and contact the appropriate agency for chemical information
   v. Remove the patient's clothing and place in a bag (if possible) to protect from further contamination. Brush off any dry particles first and then begin copious irrigation
   vi. Leave the contaminated clothes on the scene. Cover the patient over and under before loading into squad
   vii. The patient should be transported by personnel not involved in the decontamination process
   viii. Determine the severity of the burn and contact Med Control

d. Electrical Burns
   i. Shut off electrical at source- DO NOT attempt to move patient until it has been confirmed that the power is off
   ii. Assess patient for entrance and exit wounds and treat as thermal injuries
   iii. Assess patient for internal injuries, i.e., vascular damage, tissue damage, fractures and treat accordingly
   iv. Determine the severity of the burn and contact Med Control

e. Inhalation Burns
   i. Always suspect inhalation burns when the patient is found in a closed, smoky environment and/or exhibits any of the following:
      1. Burns to the face/neck
      2. Singed nasal hairs
      3. Cough and/or stridor
      4. Sooty sputum
   ii. Provide 100% O_2 via NRB, BVM, or intubation
   iii. Contact Med Control and transport

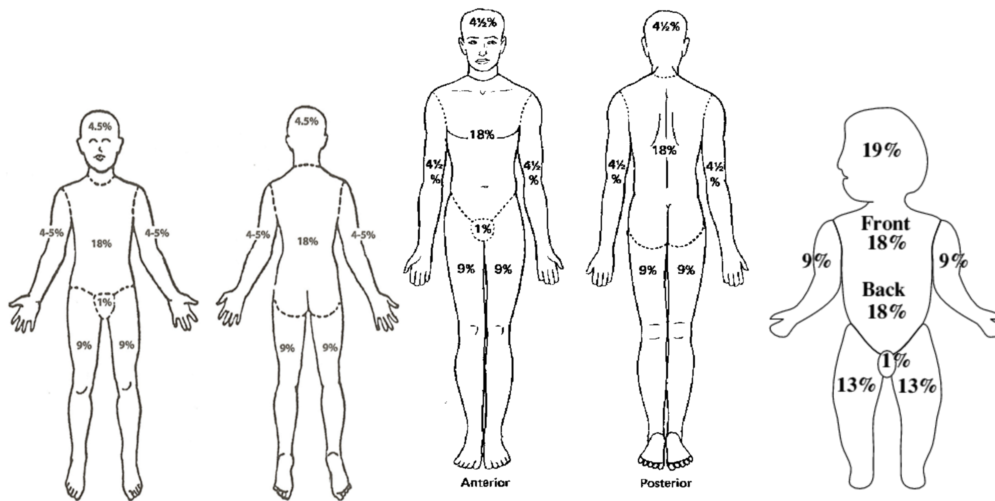
3. If patient becomes hypovolemic, start IV per Shock Protocol

DO NOT DELAY TRANSPORT FOR IV

4. Apply cardiac monitor and determine rhythm.
5. Reassess airway frequently and treat any arrhythmias (can be common in electrical burns and burns >20% BSA.
6. **Contact Med Control** to advise of patient condition and to **request Morphine 2-4mg IV very five minutes for pain relief**

By Med Control orders ONLY

Rule of Nines



Rule of Palms:
1% BSA is equal to the surface of the palm of the patient's hand (works for adults, children and infants). If unsure of the extent of the burn, describe the burn area to Med Control.

Burn Severity
Minor burns:

- Superficial- BSA <50% (sunburns, etc.)
- Partial thickness- BSA <15%
- Full thickness- BSA <2%

Moderate burns:

- Superficial- BSA >50%
- Partial thickness- BSA 15%-30%
- Full thickness- BSA 2%-10%

Critical burns:

- Partial thickness- BSA >30%
- Full thickness- BSA >10%
- Inhalation injury
- Any partial or full thickness burn involving hands, feet, joints, face, or genitalia

Source- American Burn Association

General Considerations

Rapid assessment and recognition of major trauma/multiple system trauma is essential to the subsequent treatment. Once the patient is determined to be an actual or potential major trauma/multiple system trauma, personnel on scene and/or medical control must quickly determine the appropriate course of action including:

1. Requesting aeromedical evacuation from scene
2. Ground transportation directly to an appropriate facility. If a major trauma exists, in the opinion of the senior, ranking paramedic on scene, then the patient will be transported to a verified Trauma Center. Any of the following situations or conditions may constitute major trauma:
   a. Major chest injury including:
      i. Tension pneumothorax
      ii. Open sucking chest wound
      iii. Multiple rib fractures or flair chest
      iv. Suspicion of pericardial tamponade
   b. Trauma with respiratory rate >30 or <10 or anyone with endotracheal intubation
   c. Trauma with systolic pressure <90
   d. Head injury with Glasgow Coma Score ≤12
   e. Impaled object in head, chest, neck or abdomen
   f. Major amputation above the ankle or wrist or one where re-attachment is needed
   g. Injury resulting in **major** neurological deficit (paralysis, numbness, etc.)
   h. Trauma with any witnessed extended loss of consciousness (>60 seconds)
   i. Second or third degree burns >20% if combined with major trauma
   j. Two or more long bone fractures (tibia, humerus, femur, radius)
   k. Penetrating trauma of the head, neck, torso, or extremities proximal to the elbow or knee
   l. Hypothermia associated with any of the following:
      i. Respiratory rate <10 or >30
      ii. Systolic BP <90
      iii. Altered mental status (GCS ≤12)
      iv. Heart rate <60
   m. Trauma with significant abdominal pain and/or tenderness

Notes:

- For any patient in full or impending arrest, TRANSPORT TO THE NEAREST HOSPITAL
- Any case in which the senior, ranking paramedic judges the injuries to constitute major trauma, the rationale should be clearly documented on the run report.
- The transfer of pediatric trauma patients will be under the auspices of Medical Control.
- In cases where the victim must be transported by ground units, every effort should be made to limit on-scene time to 10 minutes or less

See aeromedical evacuation procedure

Contact Med Control

Remember the **Golden Hour!**

- If patient is trapped or inaccessible, contact Med Control and advise of condition and circumstances
- If time permits, each patient should be evaluated using the Glasgow Coma Scale and the score relayed to Med Control

Assessment

All trauma incidents begin with scene size up- assess the scene for safety, determine the mechanism of injury, determine the number of patients and request additional help if necessary. Patient assessment begins by establishing life threatening injuries, chief complaints, and assessing the ABC's. It may be necessary to perform intubation early if the airway cannot be maintained and to control major bleeding. Establish a general impression of the patient's condition and prioritize each patient for transport.

Urgent Trauma Treatment

1. Manage airway, assess breathing and circulation while stabilizing C-spine.
    a. Management may include oropharyngeal, nasopharyngeal, or endotracheal intubation. Be prepared to perform an emergency cricothyrotomy if necessary.
2. Rapid head to toe survey, quick vitals/history, and prepare for rapid transport.
3. Administer 100% O_2 via appropriate means
4. Control major hemorrhage
5. Begin transport to trauma center and notify Med Control of trauma alert
6. Treat for shock including large bore IV(s) to maintain systolic BP @90
    a. Consider the use of MAST (contact Med Control)
7. Apply cardiac monitor and check rhythm
8. Perform detailed physical exam and begin management of non-life threatening injuries if time allows, i.e., splinting of fractures
9. Continually reassess patient, obtain vitals and relevant history

It may be necessary to manage chest injuries by decompression (tension pneumothorax) or applying dressings to open or sucking chest wounds

10 minute on-scene time

Detailed physical exam is done en route

Consider Trauma Center for the Following:

- Falls greater than 20 feet or 3 times the victim's height
- Pedestrian/bicyclist versus auto collisions
    - Struck by a vehicle traveling over 5 mph
    - Thrown or run over by vehicle
- Motorcycle impact at greater than 20 mph
- Ejection from a vehicle
- Severe vehicle impact
    - Speed at impact greater than 40 mph
    - Intrusion of more than 12 inches into occupant compartment
    - Vehicle deformity greater than 20 inches
- Rollover with signs of serious impact
- Death of another occupant in the vehicle
- Extrication time greater than 20 minutes

Non-Urgent Trauma Treatment

1. Establish airway, assess breathing and circulation while maintaining C-spine control
2. Obtain baseline vitals and administer 100% O_2
3. Control hemorrhage by appropriate method
   a. Consider the use of MAST (contact Med Control)
4. Splint all fracture(s) if injuries are non-life threatening
5. Obtain relevant history
6. Start IV NS if indicated by patient's injury and/or vitals
7. Apply cardiac monitor (if indicated as above)
8. Transport and advise Med Control

Treatment of Specific Traumatic Injuries

1. Chest Wounds
   a. For sucking chest wounds or open pneumothorax, cover the injury with a non-porous dressing and seal on 3 sides
   b. Stabilize flail chest with trauma dressing

Flail chest- 3 or more adjacent ribs fractured in 2 or more places

2. Evisceration
   a. Cover organs with sterile dressing moistened with saline
   b. Lay the patient flat and elevate the knees
3. Complete Amputations
   a. Control bleeding by the most appropriate method
   b. If possible, take time to find the amputated part but do not delay transport
      1. Put part in a plastic bag, seal, and place in cool water with a few ice cubes if possible

A tourniquet is a last resort to control bleeding

4. Pneumothorax, Hemothorax, or Tension Pneumothorax
    a. Transport in position of comfort and watch for signs of tension pneumothorax
    b. Signs and symptoms of a tension pneumothorax:
        1. Chest trauma
        2. Dyspnea
        3. Hypoxemia
        4. Hyperinflation of affected side
        5. Hyperresonance of affected side
        6. Diminished then absent breath sounds
        7. Cyanosis
        8. Diaphoresis
        9. Altered mental status
        10. Jugular venous distention (JVD)
        11. Hypotension
        12. Hypovolemia
        13. Tracheal deviation away from affected side (late sign)
    c. Chest decompression per procedure

Significant tension pneumothorax may present exhibiting any or all of these symptoms

5. Head Injury
    a. Evaluate patient condition:
        1. Level of consciousness
        2. Pupillary size and reaction
        3. Glasgow Coma Scale
    b. Transport with C-spine immobilized and head elevated 8-10 inches by tilting backboard
    c. Maintain airway, support with 100% O_2 by NRB and/or BVM
    d. Do not hesitate to take control of airway
    e. Prepare to assist ventilations when there are signs of cerebral herniation, i.e., blown pupils, bradycardia, posturing, etc.

Orotracheal, nasotracheal, digital intubation or cricothyrotomy may be indicated and should be accomplished gently with in-line C-spine immobilization

6. Spinal Injuries
    a. Cervical immobilization should be used if any of the following criteria are met:
        1. The patient complains of neck pain
        2. The patient has pain on palpation of the neck
        3. The patient complains of neurologic deficits or is found upon physical exam to have neurologic deficits
            a. Subjective- numbness, tingling, weakness
            b. Objective- loss or diminished sensation or motor weakness
        4. The mechanism of injury is consistent with possible neck/spine injury and the patient presents with altered LOC and impaired competence from either drugs, alcohol, or head injury
        5. The mechanism of injury is consistent with possible neck/spine injury and the patient has other major, painful, distracting injuries
        6. The patient has neck pain with any head movement

    Note: Always contact Medical Control and relay information regarding patient condition to the receiving hospital

Patients who present with any of these criteria shall have full cervical immobilization

See refusal policy for impaired competence criteria

If the patient is wearing a helmet, see Helmet Removal Policy and Procedure

Trauma Arrest

General Information

Trauma victims who are initially found to be in cardiac arrest and without vital signs may be considered dead. Resuscitation should not be attempted in traumatic cardiac arrest victims with brain tissue exposed, decapitation, and/or total body burns; or in patients with severe blunt trauma without vital signs, pupillary response, or an organized, shockable rhythm at the scene. Patients in cardiac arrest with deep penetrating cranial injuries and patients with penetrating cranial or truncal wounds associated with asystole and a transport time exceeding 15 minutes to a definitive care facility are unlikely to benefit from resuscitative efforts. Extensive, time-consuming care of trauma victims in the field is usually not warranted. Major trauma patients should be en route to a medical facility within 10 minutes unless prolonged extrication is required.

Follow the DOA policy

Treatment

1. Ventilate patient with 100% O_2 via BVM or intubate as necessary
2. Provide quality CPR with C-spine maintained
3. Immobilized C-spine and **TRANSPORT TO THE NEAREST HOSPITAL IMMEDIATELY**
4. Apply cardiac monitor
5. Start two large-bore IV's NS en route
6. If endotracheal intubation is not possible or an obstruction is present, a cricothyrotomy may be necessary
7. Assess cause of patient's condition and treat accordingly

Eye Injuries

General Considerations

1. Trauma
   - Do not allow an eye injury to distract you from the basics of trauma care.
   - Do not remove any foreign body imbedded in the eye or orbit.
   - Stabilize any large, protruding foreign objects using bulky dressings.
   - With blunt trauma to the eye, if time permits, examine the globe briefly for gross laceration as the lid may be swollen tightly shut later. Scleral rupture may lie beneath an intact conjunctiva.
     - Exert no pressure on the globe when doing the exam or when covering for transport
     - A light, sterile, wet dressing may be used to cover the eye for transport- avoid pressure directly to the eye by covering with a protective shield, such as a metal patch or a drinking cup. Do not delay transport by covering the eye if the patient has other life-threatening injuries.
   - Covering both eyes when only one eye is injured may help to minimize trauma to the injured eye, but in some cases the patient will become too anxious to tolerate.
   - Transport patient sitting upright unless other life threats prohibit this from being done or obvious globe rupture is present.

2. Chemical Burns
   - When possible, determine the type of chemical involved first. The eye should be irrigated with copious amounts of normal saline, using IV tubing run wide open for a minimum of 20 minutes and started as soon as possible after arrival to the scene. Start with 1 liter and repeat if time permits. Any delay may result in serious, permanent damage to the eye.
   - A topical ophthalmic anesthetic (Tetracaine) should be placed in the eye prior to irrigation. Always check to determine if the patient has any allergy to anesthetic agents.
   - Always obtain name, and if possible, a sample of the contaminant or ask that they be brought to the hospital as soon as possible.
3. Contact lenses
   - If possible, contact lenses should be removed from the eye- be sure to transport them to the hospital with the patient. If the lenses cannot be removed, notify the ED personnel as soon as possible.
   - If the patient is conscious and alert, it is much safer and easier to have the patient remove their lenses.
4. Acute, unilateral vision loss
   - When a patient suddenly loses vision in one eye with no pain, there may be a central retinal artery occlusion or TIA. Urgent transport and treatment is necessary.
   - Transport the patient supine.

Eye Injuries (cont.)

Treatment

1. Keep patient calm and in a supine position, unless otherwise indicated
2. Obtain pertinent history- type, where, when, how
3. Begin immediate transport and establish communications with Med Control to advise of patient condition
4. In cases that require irrigation, administer two (2) drops of topical ophthalmic anesthetic, i.e. Tetracaine, in eyes prior to irrigation

General Considerations

This protocol was written to assist those instances of hypothermic injury involving long evacuation and transport time. When possible, all treatment should be left for a hospital setting. Severe hypothermia should be considered trauma and be transported to a trauma center.

1. Generalized hypothermia
   a. The most common mechanism of death in hypothermia is ventricular fibrillation. If the hypothermia victim is in VF, CPR should be initiated. If VF is not present, all treatment and transport decisions should be tempered by the fact that VF can be caused by rough handling, noxious stimuli or even minor mechanical disturbances; this means that respiratory support with 100% O_2 should be done gently, including intubation, avoiding hyperventilation.
   b. In the absence of monitor-confirmed VF, the decision to initiate CPR must consider the following:
      i. Hypothermia may produce profound bradycardia and the pulse should be taken for at least 60 seconds before concluding that the patient is pulseless.
      ii. Hypothermia can exert a protective effect on body tissues. The hypothermia victim's own cardiac activity, even when profoundly bradycardic, may be preferred to CPR perfusion, especially in light of the fact that CPR may precipitate VF.
   c. The heart is most likely to fibrillate between 85°-88°F. (29°-31°C.)
      i. Attempt one shock only. If the patient fails to convert, defer subsequent defibrillation attempts and drug therapy until the core temperature has been increased but continue to provide quality CPR throughout transport.
   d. Since fibrillation is so difficult to convert without re-warming, measures to re-warm should be instituted in any hypothermia victim in VF. The decision to re-warm should be made in consultation with Med Control and should consider the method of re-warming available on the squad and the time/distance to the trauma center.
   e. Generalized hypothermia can occur whenever the ambient temperature is less than body temperature and the body is not capable of maintaining that temperature. For example, an elderly debilitated patient sitting in a room which is 66°F. may become hypothermic from that exposure alone. Suspect hypothermia in the injured, elderly, or debilitated patient.
2. Local Hypothermia (frostbite)
   a. Thawing should be done under controlled conditions. It can be extremely painful.
   b. Complete re-warming requires active heating for a prolonged period. Partial re-warming is worse than none. Therefore, rewarming should rarely be done in the field.

Shivering stops below 90°F

Consider hypoglycemia in the hypothermic patient

See current ACLS Guidelines

Treatment (not in cardiac arrest)

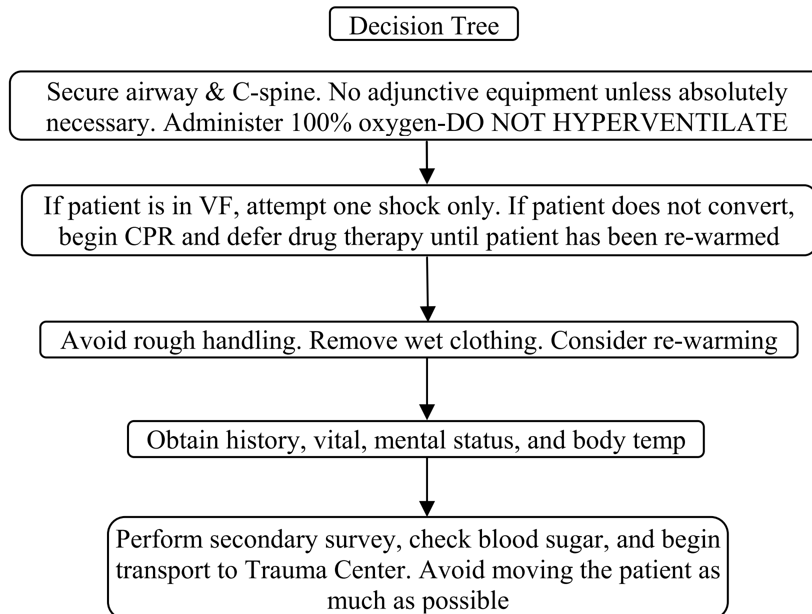
1. Secure airway and consider C-spine injury; administer 100% O_2 (warmed if available). Do not hyperventilate. Do not use adjunctive airway equipment unless absolutely necessary. Use the least intrusive measures to assure airway and ventilation
2. Avoid rough handling and move patient to warmed environment; remove any wet clothing, and cover with blankets. If re-warming is undertaken, obtain by applying warm packs or hot water bottles to trunk, neck, and groin only. Do not allow patient to ambulate. Consider pain relief with Morphine (contact Med Control).
3. Evaluate patient's general appearance. Obtain relevant history , SAMPLE, and OPQRSTI
4. Assess vitals, mental status, and approximate temperature, if possible.
5. Start IV with warm NS (if available) and administer 500cc bolus
6. Apply cardiac monitor, check rhythm. Contact Med Control for drug orders if necessary.
7. Perform secondary survey to assess any local injuries
8. Check patient's blood sugar
9. Transport to trauma center

Wet clothing robs heat from the body more than it insulates and should be removed. Protect victim from wind.

See Diabetic Protocol

Treatment (cardiac arrest)

1. Begin CPR and apply cardiac monitor
2. If patient is in VF, attempt one shock only. If patient does not convert, continue CPR and defer drug therapy until patient has been re-warmed (see above)
3. Rapid transport to trauma center



Near Drowning

General Information

There are approximately 8000 deaths due to drowning the in United States every year. Half of these occur between May and August in home pools with 90% involving children 5 years of age and younger. The second most common site is the household bathtub with the majority of victims between 7 and 15 months of age. Personal watercraft, such as a jet ski, are 8.5 times more likely to be involved with a drowning victim than other types of watercraft. 24% of preschool drownings occur with water filled buckets- the toddlers are unable to right themselves. When caring for a victim, remember that about 85% have a small to moderate amount of water in the lungs, and another 10% have none. All victims of near drowning should be transported due to the life-threatening complications that can occur, sometimes hours later.

Treatment

1. Assess ABC's with C-spine control. Do not use Heimlich/abdominal thrust unless foreign body airway obstruction is confirmed
2. Begin rescue breathing as soon as possible, even if the victim is not fully out of the water
3. Keep patient supine and provide 100% O_2 via NRB and intubate as soon as possible if the patient is apneic and/or unconscious
4. If pulseless, begin chest compressions once the victim has been removed from the water and put onto a hard surface
5. Start IV (warmed if possible) and attach monitor. Follow the proper ACLS protocol ***unless*** the patient is hypothermic.
6. Use caution for hypothermia- handle the patient gently- rough handling or movement can cause an arrhythmia. Remove wet clothing and cover with blankets.
7. Transport immediately

The key to success is the provision of early, effective, ventilatory control

See Hypothermia Protocol

Heat Emergencies

General Information

Heat emergencies generally consist of heat cramps, heat exhaustion, and heat stroke. The first two, heat cramps and exhaustion, result from dehydration and depletion of sodium and other electrolytes. Heat stroke is far more serious and potentially life threatening. It results from the failure of the body's thermoregulatory mechanisms.

Signs and Symptoms

1. Heat cramps- muscle cramps caused by overexertion and dehydration. Cramps are usually found in the fingers, arms, legs, and abdominal muscles. The patient may feel weak, dizzy, or faint. Skin is usually moist and warm.
2. Heat exhaustion- is the most common heat emergency. The patient will present with increased body temperature (over 100°F.), cool and clammy skin, rapid and shallow breathing, and weak pulses.
3. Heat Stroke- the body temperature is usually in excess of 104°F. While the skin is normally dry and very hot, it may occasionally be moist and hot from previous sweating. The patient will cease sweating, have deep respirations that may become shallow and a rapid pulse that can progressively slow; hypotension may be present along with confusion, disorientation or unconsciousness. Be alert for possible seizures.

Treatment

Heat cramps and exhaustion

1. Remove the patient from the environment
2. Evaluate ABC's and vital signs
3. Administer oral fluids, preferably a sports drink if available
4. Cool the patient by removing some clothing and place in an air conditioned area
5. Re-evaluate and transport if necessary

Heat stroke

1. Remove the patient from the environment
2. Evaluate ABC's and vital signs
3. Initiate rapid cooling by removing the patient's clothing and applying sheets that are soaked in tepid water. Fan if necessary but avoid over-cooling. Cold packs can be applied to the neck, axilla, and groin areas. Stop all cooling efforts if the patient begins to shiver.
4. Administer 100% O_2 via NRB. If respirations are inadequate, assist with BVM
5. Start 1-2 large bore IV's and run wide open.
6. If the patient is alert and oriented and able to swallow without difficulty, administer oral fluids, preferably a sports drink.
7. Apply cardiac monitor and treat accordingly
8. Monitor body temperature
9. Rapid transport

Be cautious with fluid administration in the elderly or those with other major medical problems

Abdominal Pain

General Considerations

It is important to remember that abdominal pain can be caused by a large number of different disease processes. The organ systems that may be involved include esophagus, stomach, intestinal tract, liver, pancreas, spleen, kidneys, male and female genital organs, bladder, as well as referred pain from the chest that can involve the heart, lungs, or pleura. Abdominal pain may also be caused by muscular and skeletal problems.

There are a limited number of problems that present with abdominal pain that are life threatening or may become life threatening:

- Myocardial infarction
- Perforated stomach, gallbladder, or bowel
- Gastrointestinal bleeding with pain- usually due to an ulcer
- Hemorrhagic pancreatitis
- Appendicitis
- Diabetic ketoacidosis
- Ruptured esophagus (usually presents with chest pain)
- Dissecting or ruptured abdominal aortic aneurysm
- Certain toxic mushroom ingestion and other toxic ingestion
- Ectopic pregnancy

Abdominal pain emergencies are likely to lead to death due to blood or fluid loss with resultant hypovolemic shock. There may also be severe electrolyte abnormalities that can cause arrhythmias.

Myocardial infarction may present as abdominal pain especially in women, diabetics, and the elderly.

Treatment

1. Manage airway and administer O_2 as needed to treat shock and/or respiratory distress
2. Apply pulse oximeter

   See pulse oximeter protocol
3. Evaluate patient's general appearance and obtain history:
   a. OPQRST-I
   b. SAMPLE- especially recent surgery, any abnormal ingestion, previous trauma and related medical diseases
4. Assess additional associated signs and symptoms
   a. Nausea/vomiting blood or coffee ground emesis
   b. Constipation/diarrhea- black tarry stools or bloody bowel movements
   c. Problems with urination
   d. Menstrual abnormality
   e. Tenderness/rigidity
   f. Cardiac associated symptoms- dyspnea, diaphoresis, S.O.B.
5. Transport in position of comfort- preferably supine with knees flexed unless patient has respiratory difficulty

   Give nothing by mouth
6. If there is any possibility of blood and/or fluid loss, start an IV NS TKO. If hypotension is present, run IV to maintain perfusion/adequate BP
7. Apply cardiac monitor
8. Transport

Allergic Reactions/Anaphylaxis

General Considerations

An allergic reaction is an exaggerated response by the immune system to a foreign substance. They can range from mild skin rashes to severe, life-threatening reactions called anaphylaxis. Anaphylaxis requires prompt recognition and specific treatment and can develop in seconds and cause death just minutes after exposure to the offending agent.

Common Agents That Cause Anaphylaxis

Antibiotics and other drugs	Foreign proteins (i.e. horse serum)
Foods (nuts, eggs, shrimp)	Allergen extracts (allergy shots)
Hymenoptera stings (bees, wasps)	Hormones (insulin)
Blood products	Aspirin
Non-steroidal anti-inflammatory drugs	Preservatives (sulfiting agents)
X-ray contrast media	Dextran

Treatment

1. Establish an airway and provide 100% O_2 via NRB and assist ventilations if necessary.
2. Obtain relevant history
3. Place patient in shock position if necessary and maintain body temperature
4. Start an IV NS (consider large bore if patient is borderline hypotensive)
5. For anaphylaxis from an insect bite or sting (symptomatic with hypotension and respiratory difficulty such as wheezing)
    a. Give 0.3 mg epinephrine 1:1,000 IM in lateral thigh or SQ/IM in deltoid
    b. If no significant improvement, administer Benadryl 1 mg/kg (50 mg max) IM or IV
    c. If wheezes persist, administer Proventil (albuterol) breathing treatment
    d. If the patient remains symptomatic and hypotensive, administer 0.3 mg epinephrine 1:10,000 **SLOW** IV push (see note below)
6. If reaction is minor to moderate (no hypotension/respiratory problems), administer:
    a. Benadryl 1 mg/kg (50 mg max) IM or IV
    b. Proventil (albuterol) breathing treatment

Monitor BP continuously

Use extreme caution with IV epinephrine

If patient has hives, itching, and/or swelling, contact Med Control for epinephrine orders

NOTE: It is recommended to dilute the 0.3mg (3cc) 1:10,000 epinephrine into 7cc NS and administer over 5 minutes or until the desired effect has be achieved

Altered Level of Consciousness

Treatment

1. Stabilize c-spine as needed and mange the airway by administering 100% O_2 via NRB mask. Apply pulse oximeter and treat accordingly. Be prepared to assist ventilations or intubate as necessary.
2. Evaluate the patient's general appearance and obtain history:
    a. OPQRST-I
    b. SAMPLE- especially diabetes, seizures, stroke, head injury, drug abuse, and heat illness
3. Assess the patient using the Glasgow Coma Scale. Patient's with a score of <8 have a poor prognosis and need ALS as soon as possible
4. Apply cardiac monitor and check rhythm
5. Start IV NS TKO
6. Check patient's blood sugar and treat as necessary *See Diabetic protocol*
7. Consider possible causes:
    a. *Heat Stroke*- immediate cooling is imperative! However, do NOT let cooling efforts delay transport *See Heat Emergencies*
    b. *Shock*- if patient is hypotensive, begin treatment for shock *See Shock protocol*
    c. *Stroke*- if stroke is suspected, begin treatment *See Stroke protocol*
    d. *Drug overdose*- if respirations are impaired, pupils are pinpoint, or there is a high suspicion of narcotic overdose and patient's condition has not improved, administer Narcan 2mg IV push. Monitor patient and re-evaluate after a minute or so. If patient has improved but is still not fully awake, repeat Narcan 2mg IV push.

CONSIDER PATIENT RESTRAINT BEFORE ADMINISTRATION OF NARCAN. See Patient Restraint Policy

8. Contact Med Control
9. Transport

Note- any patient not making rational decisions should be transported for a medical evaluation. Threat of suicide, overdose of medication, drugs, or alcohol, and/or threats to the health and well being of others are NOT considered to be rational. These patients are mentally incompetent and can not sign a release form.

Treatment

1. Assess ABC's and provide 100% O_2 via NRB
2. Obtain relevant history (OPQRST and SAMPLE). Has the patient eaten today? Has the patient taken insulin? How long ago? When did the symptoms begin? What other types of medication are being taken? Has this happened before?
3. Start IV NS TKO
4. Check patient's blood sugar. If <80 and the patient is symptomatic, administer 50cc D50 IV push immediately.
5. May repeat D50 IV push in 10 minutes if the blood sugar remains below 80. If unable to start IV after 2 attempts, administer glucagon 1mg IM or SQ or oral glucose if it can be tolerated by the patient.
6. If the blood sugar is over 400 and the patient is symptomatic, infuse a 250cc bolus of NS. May repeat in 10-15 minutes if no response.
7. If unable to obtain blood sugar, LOC is decreased, and there is reason to suspect hypoglycemia, administer 50cc D50 IV push.
8. If patient does not improve rapidly, apply cardiac monitor and begin transport (see altered LOC protocol)

Look for medic alert tag

Glucagon will only work if the body has enough stores of glycogen. This is a much slower process than D50.
If the patient is conscious and can swallow without difficulty, consider orange juice, sugared soda, etc.

May be harmful in stroke patients

Toxicology and Poisoning

General Considerations

Consider the possibility of accidental or intentional poisoning under the following conditions:

- History of observed or admitted accidental or intentional poisoning
- Coma
- History of known suicide gesture
- Suggestive intoxicated behavior (hyperactive, hypoactive, unstable walk, lethargic)

Follow Hazardous Materials Protocol as needed

Treatment

1. Secure airway, administer 100% O_2 via NRB or intubate as needed
2. Obtain relevant history, i.e., what, when, why; quantity taken; victim's age and weight
3. Evaluate breath sounds, LOC, pupil size, and examine for head injury
4. Apply monitor and check rhythm
5. Treat patient based on the following:
   a. Ingested poisons
      i. Notify Med Control and transport
   b. Inhaled poisons
      i. Remove patient from toxic area
      ii. Assist ventilations or intubate as necessary
   c. Absorbed poisons
      i. Carefully remove victim's clothing (take proper precautions)
      ii. Identify substance
      iii. Flush skin with water before and during transport if possible
      iv. If eyes are involved flush with water or saline for 20 minutes
   d. Injected poisons
      i. Find substance and introduction system if possible
      ii. If due to bite or sting, follow the Anaphylactic Protocol
6. Start IV NS TKO en route and notify Med Control

Take whatever container the medication or product came from to the hospital unless this results in an unreasonable delay

If altered LOC, see Altered LOC protocol

Do not delay transport

Precautions

Contact Med Control prior to any advanced prehospital care, i.e., medications, IV's, etc.). Look for pupillary changes; look for bystanders with similar symptoms. **CONTACT WESTSHORE HAZARDOUS MATERIALS TEAM AS EARLY AS POSSIBLE**.

Treatment

1. Carbon Monoxide poisoning (including all cases of altered mental status in the hazmat setting)
    a. Remove patient and rescuers to an area with fresh air
    b. Perform primary and secondary surveys. Obtain detailed history
    c. Secure airway, administer 100% O_2 via NRB or intubate as needed
    d. Stabilize c-spine if trauma is suspected
    e. Contact med control and proceed with altered LOC protocol
2. Cyanide poisoning
    a. Cyanide antidote kit- obtain from Hazmat Team
        i. Amyl Nitrate Aspirols- broken in hand, one at a time, on a gauze pad under the patient's nose allowing the patient to inhale for 15 seconds followed by a 15 second rest. Repeat until Sodium Nitrate can be administered. Use a fresh Aspirol every 5 minutes.
        ii. Sodium Nitrate- administer 300mg (10ml of 30% solution) IV push over 5 minutes (PEDS dose- 0.2ml/kg of 30% solution up to 10ml). Follow Sodium Nitrate immediately with Sodium Thiosulfate.
        iii. Sodium Thiosulfate- Administer 12.5gm (50ml of 25% solution) IV push over 5 minutes (PEDS- 1.2ml/kg of 25% solution up to 50ml)
        iv. If toxic signs/symptoms reappear, repeat both the Sodium Nitrate and the Sodium Thiosulfate at ½ the original dose.

Cyanide kit is on hazmat vehicle and in hospital ED

3. Acute Sulfide Poisoning
    a. Amyl Nitrate Aspirol (as in cyanide poisoning)
    b. Sodium Nitrate (as in cyanide poisoning)
    c. Do NOT give Sodium Thiosulfate
4. Organophosphate/ Carbamate Poisoning
    a. Atropine 2mg IV push- repeat every 5 minutes until "Atropinization" occurs. The end point is the dry-up of all secretions. (PEDS- 0.05mg/kg IV push)

High doses of Atropine are on the Hazmat vehicle

5. Acid burns to Eyes
    a. Remove contact lenses, if appropriate. Immediately flush with NS

See Eye Injuries

6. Bronchospasm (secondary to toxic inhalation)- See Respiratory Emergencies
7. Tachydysrhythmias (particularly SVT) due to cardiac sensitization secondary to toxic materials- See appropriate dysrhythmia protocol
8. Acid or Caustic burns to skin
    a. Remove clothing using proper precautions. Remove dry particles by brushing first, then flush with copious amounts of water or normal saline

Psychiatric Emergencies

Treatment

1. Assessment
   a. Observe patient's posture and emotional state. Use caution if patient displays rage, fear, anxiety, confusion, or anger.
   b. Determine patient's mental state. Note awareness, orientation, cognitive abilities, and affect (mood).
2. Control the scene as soon as possible. Remove all non-essential personnel and stay alert for any signs of aggression.
3. Obtain relevant history:
   a. Previous psychiatric hospitalization (when and where)
   b. Where does patient receive care?
   c. What drugs/medications does patient currently take (including alcohol)?
4. Communicate using the following techniques:
   a. Listen
   b. Spend time
   c. Be confident and professional
   d. Do not fear silence
   e. Put yourself at the patient's level
   f. Keep a safe and proper distance
   g. Appear comfortable
   h. Do not be judgmental
   i. Never lie to the patient
5. Obtain vitals
6. Treat any medical conditions by providing O_2 as needed, wound care, etc.
7. Contact Med Control and advise of patient condition.
8. **If necessary, apply restraints to protect the patient, technicians, and bystanders- see Restraint Policy**
9. Transport to appropriate facility

Note- any patient not making rational decisions should be transported for a medical evaluation. Threat of suicide, overdose of medication, drugs, or alcohol, and/or threats to the health and well being of others are NOT considered to be rational. These patients are mentally incompetent and can not sign a release form.

If patient becomes violent, contact law enforcement immediately

Treatment

Assess breath sounds and treat as follows:

1. Airway open, breath sounds absent:
    a. Provide 100% O_2 via NRB or BVM
    b. Endotracheal intubation
    c. Treat cause and transport
2. Airway obstructed:
    a. Follow BLS algorithm for foreign body airway obstruction
    b. If unsuccessful, attempt to visualize with laryngoscope and remove object with Magill forceps
    c. If no success and patient is unstable, perform cricothyrotomy or needle cricothyrotomy
3. Spontaneous breathing
    a. Clear breath sounds
        i. Treat cause such as MI, pulmonary embolism, metabolic disturbance, hyperventilation)
    b. Wheezes present
        i. Severe allergic reaction (wheezing with throat tightness, trouble swallowing, tongue swelling, or hypotension)
            1. Start IV NS TKO
            2. Administer 0.3mg epinephrine 1:1,000 IM in lateral thigh
            3. If no significant improvement, administer Benadryl (diphenhydramine) 1mg/kg (50mg max) IM or IV
            4. If wheezes persist, administer Proventil (albuterol) breathing treatment- 2.5mg (3cc) of Proventil in aerosol unit with 8 lpm oxygen
            5. If no change and the patient is hypotensive, administer 0.3 mg epinephrine 1:10,000 IV SLOW push
        ii. Asthma
            1. Minor distress
                a. Place patient in position of comfort and support with oxygen
                b. Consider Proventil (albuterol) breathing treatment- 2.5mg (3cc) of Proventil in aerosol unit with 8 lpm oxygen
            2. Severe distress
                a. Sitting position and assist breathing with high-flow O_2
                b. Proventil (albuterol) breathing treatment- 2.5mg (3cc) of Proventil in aerosol unit with 8 lpm oxygen
                c. Contact Med Control for possible administration of epinephrine
                d. Start IV NS TKO

If secondary to allergic reaction, see Allergic Reaction/Anaphylaxis Protocol

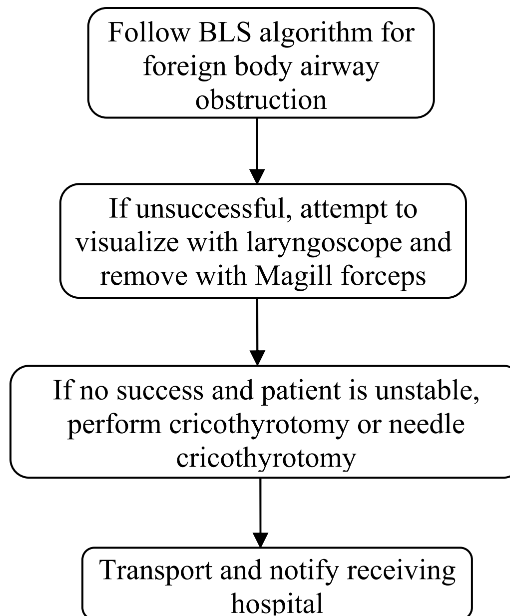
Use extreme caution with IV epinephrine

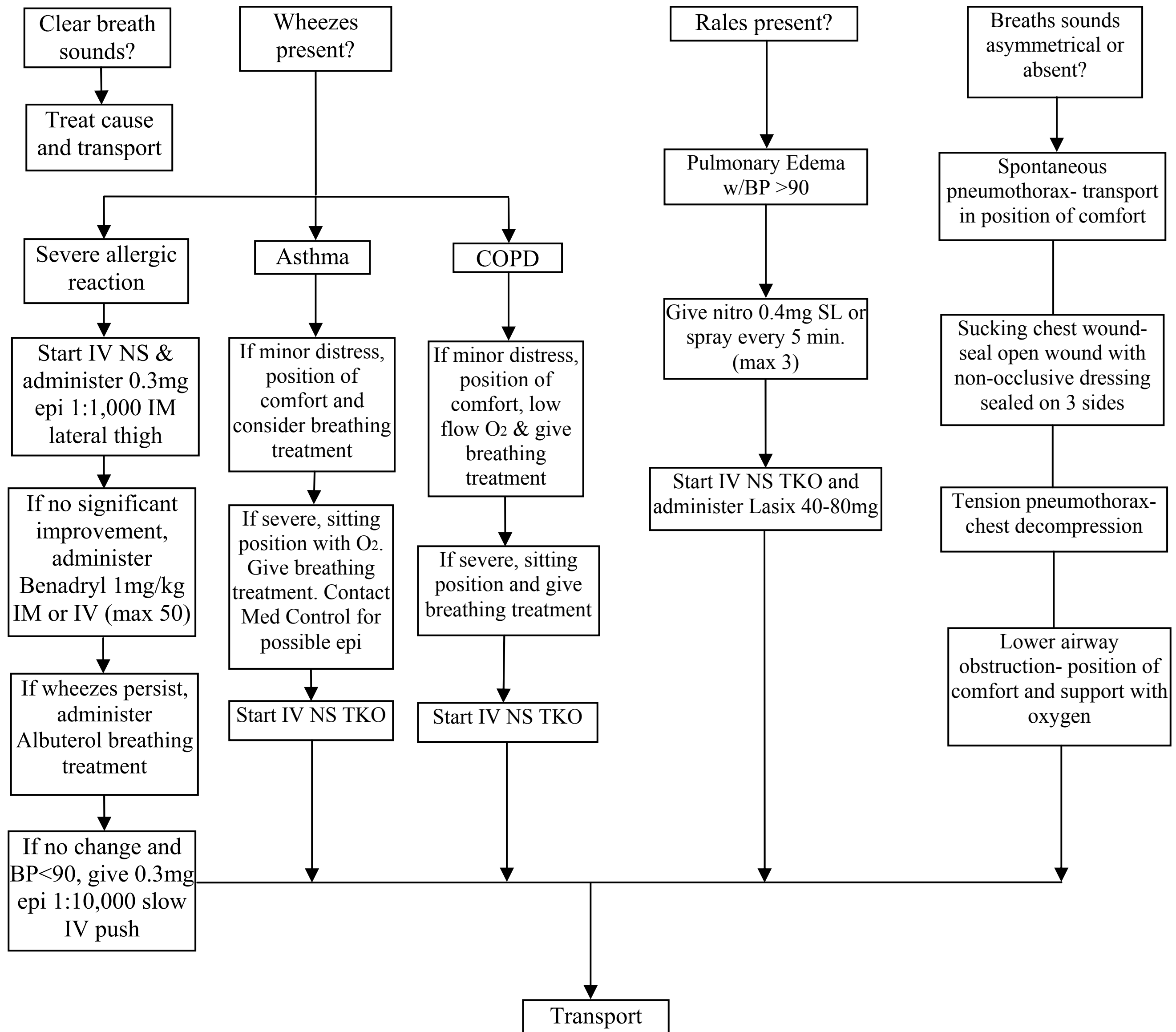
iii. COPD
1. Minor distress
a. Place patient in position of comfort and support with LOW FLOW oxygen
b. Proventil (albuterol) breathing treatment- 2.5mg (3cc) of Proventil in aerosol unit with 8 lpm oxygen
2. Severe distress
a. Sitting position and assist breathing with HIGH-FLOW O_2
b. Proventil (albuterol) breathing treatment- 2.5mg (3cc) of Proventil in aerosol unit with 8 lpm oxygen
c. Start IV NS TKO

c. Rales present
i. Pulmonary edema (Systolic BP> 90)
1. Establish IV NS TKO
2. **Administer sublingual nitroglycerin 0.4mg** every 5 minutes tablet or spray (max 3). Obtain BP after each dose and **discontinue if systolic BP drops below 90.**
3. Administer Lasix 40-80mg IV over 1-2 minutes. Use lower dose for patients who are not on diuretics and higher dose for those who are.
4. Transport

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

d. Breath sounds asymmetrical or absent
i. Spontaneous pneumothorax
1. Transport in position of comfort
ii. Sucking chest wound
1. Seal open wound with non-occlusive dressing sealed on 3 sides. Monitor for tension pneumothorax
iii. Tension Pneumothorax
1. Chest decompression
iv. Lower airway obstruction
1. Place patient in position of comfort and support with oxygen via NRB


Obstructed airway decision tree
Follow BLS algorithm for foreign body airway obstruction
If unsuccessful, attempt to visualize with laryngoscope and remove with Magill forceps
If no success and patient is unstable, perform cricothyrotomy or needle cricothyrotomy
Transport and notify receiving hospital


Spontaneous breathing decision tree
Clear breath sounds?
Treat cause and transport
Wheezes present?
Severe allergic reaction
Start IV NS & administer 0.3mg epi 1:1,000 IM lateral thigh
If no significant improvement, administer Benadryl 1mg/kg IM or IV (max 50)
If wheezes persist, administer Albuterol breathing treatment
If no change and BP<90, give 0.3mg epi 1:10,000 slow IV push
Asthma
If minor distress, position of comfort and consider breathing treatment
If severe, sitting position with O2. Give breathing treatment. Contact Med Control for possible epi
Start IV NS TKO
COPD
If minor distress, position of comfort, low flow O2 & give breathing treatment
If severe, sitting position and give breathing treatment
Start IV NS TKO
Rales present?
Pulmonary Edema w/BP >90
Give nitro 0.4mg SL or spray every 5 min. (max 3)
Start IV NS TKO and administer Lasix 40-80mg
Breaths sounds asymmetrical or absent?
Spontaneous pneumothorax- transport in position of comfort
Sucking chest wound- seal open wound with non-occlusive dressing sealed on 3 sides
Tension pneumothorax- chest decompression
Lower airway obstruction- position of comfort and support with oxygen
Transport

General Considerations

A seizure is a temporary alteration in behavior due to the massive electrical discharge of one or more groups of neurons in the brain. Seizures can be clinically classified as generalized or partial. There are three types of generalized seizures: tonic-clonic (also known as grand mal), absence seizures (also known as petit mal), and pseudoseizures. There are two types of partial seizures: simple partial seizures (also known as focal motor) and complex partial seizures (often characterized by distinctive auras). Status epilepticus is a series of two or more generalized motor seizures without an intervening return to consciousness. It is usually due to failure to take anticonvulsant medications (adults). It can be life threatening since it may involve a prolonged period of apnea which can result in hypoxia.

Treatment

1. Protect the patient by moving objects away that might cause injuries- protect but do not restrain the patient.
2. Clear and maintain airway. Never force an object between the patient's teeth.
3. Administer 100% O_2 via NRB
4. Obtain history from family and/or bystanders:
    a. Seizure history
    b. Description of seizure onset
    c. Medications
    d. Other known medical history (especially head trauma, diabetes, drugs, alcohol, stroke, and heart disease)
5. Evaluate patient for evidence of head trauma and drug abuse
6. Apply cardiac monitor and check rhythm
7. Start IV NS TKO (en route if seizures persist or recur)
8. Check patient's blood sugar. If <80, administer 50cc of 50% dextrose IV push
9. If actively seizing, contact Med Control for Valium order (5mg slow IV push). If Valium has been administered, be prepared to intubate and assist ventilations with BVM. If the patient is postictal, position the patient on their side to prevent aspiration
10. Transport and notify receiving hospital

May consider the use of a nasal trumpet

Do not delay transport

By Med Control order ONLY

General Considerations

Shock can be defined as inadequate tissue perfusion (hypoperfusion). It is generally broken down into 5 types: cardiogenic, hypovolemic, neurogenic, anaphylactic, and septic. Treatment should be based on establishing an airway and providing adequate oxygen, determining the type of shock and corresponding treatment, and replacing fluids.

Treatment

1. Establish an airway and provide 100% O_2 via NRB. Assist ventilations with BVM and intubate as needed.
2. Obtain relevant history
3. Place patient in proper shock position
   a. Hypotension- supine with feet elevated
   b. Respiratory difficulty- head elevated
   c. C-spine immobilization as indicated
4. Maintain body temperature
5. Start large bore IV NS and control any major bleeding
6. For hypovolemic, neurogenic, or septic shock, administer 250cc NS bolus to maintain systolic BP>90 and heart rate<120. May repeat x 2 if needed to maintain perfusion. Start second large bore IV as needed.
7. For anaphylaxis from an insect bite or sting (symptomatic with hypotension and respiratory difficulty such as wheezing):
   a. Give 0.3mg epinephrine 1:1,000 IM in lateral thigh.
   b. If no significant improvement, administer Benadryl 1mg/kg (50mg max) IM or IV.
   c. If wheezes persist, administer Proventil (albuterol) breathing treatment.
   d. If the patient remains hypotensive, administer 0.3 mg epinephrine 1:10,000 SLOW IV push.
8. Apply monitor and check rhythm. For cardiogenic shock, see appropriate cardiac protocol. If BP<90 with poor perfusion, administer 250cc NS bolus and start second IV if needed.
9. Notify receiving hospital and rapid transport

Do not delay transport with IV attempts

Contact Med Control to advise of delayed transport or entrapment

If patient has hives, itching, and/or swelling, contact Med Control for epinephrine orders

Monitor BP

Use extreme caution with IV epinephrine

General Considerations

A stroke, also known as a cerebrovascular accident (CVA) or "brain attack", is a term that describes injury or death of brain tissue due to the interruption of cerebral blood flow. Strokes are the third most common cause of death and also are a frequent cause of disability. There are two major types:

- Ischemic stroke (85%)- often caused by an occlusion of an artery in the brain
- Hemorrhagic stroke (15%)- occurs when a blood vessel in the brain suddenly ruptures

Early recognition of an acute stroke is vital because administration of fibrinolytic treatment (clot-busting drugs) must begin within 3 hours of onset of symptoms. Emergency care providers should try to determine when the patient was last seen as "normal" and relay this critical information to the physician in the ED. Common signs and symptoms include:

- Sudden weakness or numbness of the face, arm, or leg, especially on one side of the body
- Sudden confusion
- Trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking
- Dizziness or loss of balance or coordination
- Sudden severe headache with no known cause

Common risk factors include:

- Hypertension
- Diabetes
- Heart Disease
- History of previous stroke or TIA

Treatment

1. Assess patient, vitals, obtain history, and recognize the signs of stroke
2. Apply pulse oximeter. If oxygen saturation is <92% or reading can not be determined, administer 100% O_2 via NRB and assist ventilations if needed with BVM
3. Perform rapid stroke assessment, such as the Cincinnati Prehospital Stroke Scale (CPSS)
4. Determine when the patient was last seen as "normal"
5. Obtain IV access Apply cardiac monitor
6. Check patient's blood sugar. If <80, administer 50cc of 50% dextrose IV push. If >400, infuse a 250cc bolus of NS. If blood sugar can not be determined and there is strong evidence of hypoglycemia, administer 50cc of 50% dextrose IV push and document why readings could not be obtained.
7. Notify Med Control of possible stroke patient and transport

Avoid excessive hyperventilation- can cause cerebral vasoconstriction

Do not treat elevations in BP

Unnecessary glucose administration can exacerbate stroke symptoms

Note: It is beneficial to have the witness of time of onset come to hospital with squad or provide telephone number where he/she may be reached.

General Considerations

Unless delivery imminent, transport to a hospital with obstetrical capabilities, preferably the mother's designated hospital. Imminent delivery is when the presenting part is visible in the vaginal opening during a contraction (crowning). A visual inspection of the perineal area should be done when contractions are less than 5 minutes apart and/or there is bleeding or fluid discharge. Never place a gloved hand inside the vagina except in the case of breech delivery with entrapped head or a prolapsed umbilical cord. During delivery, steady pressure (flat hand on the baby's head) should be applied to prevent an rapid expulsion. Always place the mother on the floor or on the cot during delivery to prevent the baby from falling.

Treatment

1. Obtain history of patient condition and pregnancy including:
    a. Contraction duration and interval
    b. Expected due date
    c. Number of pregnancies
    d. Number of live children
    e. Prenatal care
    f. Multiple births (twins?)
    g. Possible complications
2. Assess vitals, provide O_2 as needed, reassure mother and transport unless crowning is present.
3. If delivery is imminent, prepare equipment and follow guidelines for delivery. Equipment includes: personal protective equipment, OB kit, oxygen, BVM, towels and blankets, cot, and large dressings.
4. After delivery, clamp cord in 2 places and cut. Determine Apgar score at 1 and 5 minutes. Note exact time of delivery. Transport mother on cot and baby in care seat if available, or have medic hold baby during transport.

Transport mother in left lateral recumbent position

		Score of 0	***Score of 1***	***Score of 2***
Appearance	Skin color	blue all over	blue at extremities	normal
Pulse	Heart rate	absent	<100	>100
Grimace	Reflex irritability	no response to stimulation	grimace/feeble cry when stimulated	sneeze/cough/pulls away when stimulated
Activity	Muscle tone	none	some flexion	active movement
Respiration	Respiration	absent	weak or irregular	strong

5. Keep mother and baby warm and well oxygenated
6. Start IV NS and resuscitate if hypovolemic or poor perfusion
7. Notify receiving hospital and transport

CONTACT MED CONTROL AS SOON AS ANY COMPLICATION IS DISCOVERED

Delivery Complications

1. Cord around baby's neck
   a. As baby's head passes out the vaginal opening, feel for the cord, Initially try to slip the cord over the baby's head; if it is too tight, clamp the cord in 2 places and cut between the clamps
2. Breech delivery
   a. Footling breech (one or both feet delivered first) - avoid prehospital delivery if possible. Transport mother with hips elevated and advise not to push. Rapid transport with oxygen and IV
   b. Frank breech (buttocks first presentation) - when the feet or buttocks present first, there is normally time to transport to the nearest facility. If upper thighs or buttocks have come out of the vagina, delivery is imminent. If the baby's body has delivered and the head appears caught in the vagina, support the baby's body and insert two fingers into the vagina along the child's neck until the chin is located. The two fingers should be placed between the chin and the vaginal opening and advanced past the nose and mouth. This will provide a passage for air to the baby. Keep the baby warm. This passage must be maintained until the child is completely delivered.
3. Excessive bleeding (pre-delivery)
   a. If bleeding is excessive and delivery is imminent, in addition to normal delivery procedures, treat the mother for shock as needed
   b. If delivery is not imminent, treat for shock and transport mother on left side
4. Excessive bleeding (post-delivery)
   a. If bleeding appears excessive (up to 500cc is considered normal), start IV and treat for shock as necessary
   b. If placenta has delivered, massage uterus and put baby to mother's breast
5. Prolapsed cord
   a. When the umbilical cord passes through the vagina and is exposed, check the cord for a pulse during contractions. If the pulse is compromised, insert two fingers in the vagina to elevate the presenting part away from the cord and distribute pressure evenly when the occiput presents. DO NOT attempt to push the cord back in.
   b. Transport the mother in the knee-chest position or with hips elevated. Keep a warm, moist dressing around the cord. Provide high flow O_2.
6. Meconium aspiration
   a. If the amniotic fluid is thick and greenish in color, suspect meconium aspiration. Attention to airway management is vital- suction the mouth then nose vigorously with a bulb syringe and/or meconium aspirator. Intubation is not recommended
   b. Airway management must precede the first breath to prevent meconium aspiration

Do not delay transport for IV

Make a "V" with the fingers

See shock protocol

Notify the receiving hospital

Treatment

1. Miscarriage- premature termination of a pregnancy prior to 20 weeks gestation
    a. Assess for shock and treat per shock protocol
    b. Give emotional support to patient and/or family
    c. Be sure to take all expelled tissue with you to the hospital
2. Ectopic pregnancy- when growth and development of a fertilized egg occurs outside the uterus
    a. The patient may experience severe abdominal pain and may have intra-abdominal and/or vaginal bleeding and discharge
    b. The patient may not even be aware that she is pregnant
    c. Treat for hypovolemic shock
    d. Transport supine with knees flexed
    e. Take any expelled tissue with you to the hospital
3. Cardiac arrest of the mother- cardiac resuscitation is unique because of the changes in maternal cardiovascular and respiratory physiology
    a. Precipitating events for cardiac arrest include: pulmonary embolism, trauma, hemorrhage or congenital or acquired cardiac disease
    b. Standard resuscitative protocol should be carried out
    c. When the mother is supine, the fetus may compress the iliac vessels, the inferior vena cava, and the abdominal aorta. To minimize effects of the fetal pressure on venous return:
        i. Place a wedge (pillow) under the right abdominal flank and hip or
        ii. Apply continuous manual displacement of the uterus to the left
4. Third trimester bleeding
    a. Abruptio placenta- premature separation of the placenta from the uterine wall. Characterized by abdominal pain and bleeding.
        i. Bleeding may be dark (venous)
        ii. Uterus may be tender
    b. Placenta previa- the placenta is partially or completely covering the cervical (birth) canal. Characterized by painless vaginal bleeding
        i. Bleeding may be bright red (arterial)
        ii. Uterus may be non-tender
        iii. Never do a vaginal exam
5. General care of the pregnant patient
    a. Whenever possible, transport the mother in the left lateral recumbent position
    b. Trauma patients can be immobilized on the backboard with c-spine immobilization and the board tipped to the left to allow the fetus to shift off the inferior vena cava
    c. Oxygen therapy is not harmful and should be given as indicated

Introduction

Only the guidelines unique to children are found in this section. All of the protocols in this reference include pediatric drug dosages and special pediatric considerations. The pediatric protocols pertain specifically to children 8 years of age and under and less than 100 pounds.

1. Equipment
    a. Monitor/defibrillator with pediatric paddles and/or quick patches
    b. Pediatric O_2 face masks, airways, and bag valve mask devices
    c. Pediatric BP cuffs
    d. Pediatric cervical collars
    e. Pediatric traction or Sager splints
    f. Pediatric IV catheters (20-24 gauge)- IO needles
    g. Broslow tape

2. General Principles
    a. Most pediatric medical emergencies are respiratory in nature
    b. Most pediatric respiratory emergencies can be managed with oxygen, suction, proper positioning and occasionally positive pressure ventilation with a BVM device.
    c. Considering the difficulty of starting IVs on infants and children in shock and the generally short transport time, there is rarely a need to start an IV on scene. In the rare case where it may be necessary, do not delay transport for IV access.

Intubation of children and infants is rarely advised. Assist breathing with bag valve mask as necessary

3. Oxygen Therapy
    a. Unlike oxygen therapy in some adult patients in whom it can depress respiration, oxygen administered to the pediatric patient is rarely harmful even at high concentrations for short periods of time. However, the means by which it is administered can agitate a frightened child and in doing so may worsen the respiratory distress.
    b. Oxygen rate:
        i. Mask- 6-8 lpm
        ii. Cannula- 4 lpm
        iii. Aerosol mask- 8 lpm
        iv. BVM device- 100-15 lpm

4. Suction
    a. Similarly, suction can produce agitation and worsen respiratory distress. In the newborn, a suction catheter may cause a reflex slowing of the heart (bradycardia).

5. Positive Pressure Ventilation
    a. The force necessary to create an adequate seat between the mask and the patient's face can distort proper head position and jeopardize the airway. Excessive pressures may be transmitted and result in a pneumothorax. Excessive pressures may also cause gastric distention and vomiting.
    b. The ventilation rate for infants <1 year is 30/minute; 1-8 years is 20/min.
    c. BVM size should be "infant" size for infants <1 year; "child" size if between 1-8 years, and "adult" size if age is >8 years.

6. <u>Endotracheal tubes</u>
   a. The narrowest part of a child's airway is the portion just below the vocal cords where an endotracheal cuff would apply pressure if used. For this reason, uncuffed ET tubes are used in children under the age of 8. Because the tubes are uncuffed, an accurate fit is critical.
   b. ET tube size estimates:
      i. Newborn- 3mm
      ii. 1 month through 1 year- 3.5-4mm
      iii. After age 1: (Age in years) + 16 divided by 4= size in mm
      iv. Estimate by using the size of the little finger nail
   c. Laryngoscope blade size:
      i. 0-2 years- No. 1 straight Miller blade
      ii. 2-12 years- No. 2 straight Miller blade or Macintosh
      iii. 12+ years- No. 3 straight Miller or Macintosh

Proper placement is critical. Because of the short trachea in a child, it is easy to pass the ET tube too far resulting in a right bronchial position. Constantly monitor tube, breath sounds, and chest motion.

7. <u>Intravenous Line Placement</u>
   a. As noted in ventilatory procedures, IV placement may worsen the respiratory status of a child by increasing agitation. Also, attempts at IV placement in the prehospital setting may result in significant delays in transport.
   b. Peripheral venous access lines will be the preferred route for fluid and drug therapy in any life or limb threatening emergency
   c. In situations where IV access appears futile after 3 attempts (attempts include visual and tactile inspection for peripheral sites) and/or 90 seconds of attempts, an intraosseous line should be started.
   d. Fluid of choice is normal saline. Use a macrodrip for children >2 years of age. A microdrip should be used for children 0-2 years of age.
   e. Fluid bolus rate for hypotension/shock is 20 cc/kg. Signs and symptoms include: altered mental status, dry skin, low BP, poor capillary refill and/or poor peripheral pulses.
8. <u>Intraosseous Infusion</u>
   a. Intraosseous infusion is indicated in the pediatric patient in order to obtain immediate vascular access in the cardiopulmonary or traumatic arrest scenario. It is not to be attempted in newborns or conscious patients. In situations where IV access appears futile after 3 attempts (attempts include visual and tactile inspection for peripheral sites) and/or 90 seconds of attempts, an intraosseous line should be started at the pre-tibial site.
   b. Intraosseous infusion is contraindicated in the following situations:
      i. Recent or present tibia fracture(s)
      ii. Cellulitis at the site
      iii. Burns at the site

9. Load and Go
    a. The presence of the following BTLS "load and go" situations indicate the need for immediate transport:
        i. Airway obstruction that cannot be relieved
        ii. Traumatic cardiac arrest
        iii. Tension pneumothorax
        iv. Pericardial tamponade
        v. Penetrating wounds of the chest with shock
        vi. Massive Hemothorax with shock
        vii. Head injury with unilateral dilated pupil
        viii. Head injury with rapidly deteriorating condition

General Considerations
Current Pediatric Advanced Life Support guidelines from the American Heart Association were used to establish these protocols. Life-threatening cardiac rhythm disturbances are usually the result, not the cause, of acute emergencies. Pediatric arrhythmias should be treated only if they compromise cardiac output or they have the potential to degrade into a life-threatening rhythm. Initial therapy will consist of proper ventilation and oxygenation, along with the assessment of cardiac output. Always refer to the Broslow Pediatric Emergency Tape when unsure about patient weight, age, and/or drug dosage.

Always refer to the current American Heart Association recommendations for CPR compression to ventilation ratios

Treatment
1. Open the airway and provide 100% O_2 via NRB. Assist ventilations if rate is above or below normal limits and signs of hypoxia are present. Apply pulse oximeter. Bag the patient or intubate if indicated.

Age Group	Respiratory Rate	Heart Rate	Systolic Blood Pressure
Newborn	30 - 50	120 - 160	50 - 70
Infant (1-12 months)	20 - 30	80 - 140	70 - 100
Toddler (1-3 yrs.)	20 - 30	80 - 130	80 - 110
Preschooler (3-5 yrs.)	20 - 30	80 - 120	80 - 110
School Age (6-12 yrs.)	20 - 30	70 - 110	100 - 120
Adolescent (13+ yrs.)	12 - 20	55 - 105	110 - 120

Ventilate @30 breaths/min. for children <1 year of age and @ 20 breaths/min. for children >1 year

2. Evaluate patient's general appearance and determine:
   a. Vital signs
   b. Level of consciousness
   c. Cardiac output
   d. Lung sounds

***Note:** If patient shows signs of decreased cardiac output (low BP, ↓LOC, poor cap refill, no peripheral pulses) and a slow heart rate does not respond to oxygenation, Start CPR*

Less than 80 bpm in infants
Less than 60 bpm 1-8 years

3. Obtain relevant history of current condition
4. Apply monitor and determine arrhythmia
5. Start IV NS TKO

6. Treat arrhythmias as follows:
    a. Bradycardia
        i. Begin CPR
        ii. Administer epinephrine 0.1 cc/kg 1:10,000 (0.01mg/kg) IV or IO
        iii. If no response, administer Atropine 0.02mg/kg. May be repeated once. Minimum dose-0.1 mg. Maximum dose-0.5 mg (child) or 1.0 mg (teen).
        iv. Transport and contact Med Control for possible pacing orders
    b. Supraventricular Tachycardia
        i. If patient is asymptomatic, do not treat. Transport immediately.
        ii. Request history of WPW syndrome. If present, transport.
            1. If patient is symptomatic (signs of CHF, poor cap refill, hypotension) and rate >240, contact Med Control for possible Adenocard order:
                a. Administer Adenosine 0.1 mg/kg (max 6mg) rapid IV push followed immediately by 10cc NS bolus
                b. If no conversion, repeat Adenosine in 1-2 minutes @0.2 mg/kg (max 12mg) rapid IV push followed immediately by 10cc NS bolus
                c. If no conversion, repeat Adenosine in 1-2 minutes @0.2 mg/kg (max 12mg) rapid IV push followed immediately by 10cc NS bolus
                d. Contact Med Control for possible cardioversion @ 0.5 joules/kg

Note: ***If child is grossly symptomatic(unresponsive or obtunded) contact Med Control immediately for possible cardioversion @ 0.5 joules/kg***

Treat only if infant rate <80/min. and poor cardiac output, child heart rate <60/min. and poor cardiac output, and/or airway management and 100% O_2 does not improve condition

If hypovolemia is suspected, follow Shock protocol

By Med Control orders ONLY

Max of 3 doses (30mg) Adenosine

Cardiac Arrest

General Considerations

Cardiac arrest in children is primarily due to the lack of an adequate airway, resulting in hypoxia. Treatment must focus on opening and maintaining the airway and providing 100% O_2. When using a BVM on a pediatric patient, cricoid pressure can be applied to prevent gastric distention. Transport immediately when excessive hemorrhage or hypothermia is present. Advanced life support measures should be implemented immediately and continued during transport. If an IV cannot be established, an IO should be started. If SIDS (Sudden Infant Death Syndrome) is suspected, initiate basic and advanced life support measures unless rigor mortis or signs of lividity are present. Reassure the parents that they are not at fault and encourage family to have friends or neighbors accompany them to the hospital. AED's are recommended for children 1 year and older- use of a child reduction system should be done if such a device is available.

Refer to a Broslow Pediatric Emergency Tape when unsure about patient weight, age, and/or drug dosage

Treatment

1. ABC's. Assess airway, bag patient or intubate patient as needed
2. Start IV NS TKO or IO
3. Apply cardiac monitor. Treat as follows:

Ventricular Fibrillation or Pulseless Ventricular Tachycardia

1. Defibrillate @2 joules/kg if total downtime is less than 4 minutes (if >4 minutes provide 2 minutes of CPR then defibrillate @2 joules/kg)
2. If no response, provide 2 minutes of CPR and administer epinephrine IV or IO (0.01mg/kg of 1:10,000 or 0.1cc/kg)
3. If no response, defibrillate @4 joules/kg
4. If no response, provide 2 minutes of CPR and administer Amiodarone 5mg/kg or lidocaine 1mg/kg IV or IO.
5. If no change, defibrillate @4 joules/kg
6. If no response, repeat Amiodarone 5mg/kg IV/IO or lidocaine 1 mg/kg while continuing CPR for 2 minutes
7. If no change, defibrillate @4 joules/kg
8. Continue CPR and transport

Give epinephrine every 3 minutes during arrest

Amiodarone is the preferred drug

Continue using same medication as before

Asystole (if rhythm is unclear and possibly VF, follow pediatric VF protocol)

Confirm Asystole in 2 leads

1. Begin CPR unless apparent rigor mortis or signs of lividity are present
2. Start IV or IO and administer epinephrine (0.01mg/kg of 1:10,000 or 0.1cc/kg)
3. If no change after 1-2 minutes, administer atropine 0.02mg/kg. May be repeated one time. Minimum dose-0.1 mg. Maximum dose-0.5 mg (child) or 1.0 mg (teen)
4. If no response, begin transport while continuing CPR

Give epinephrine every 3 minutes during arrest

PEA

1. Begin CPR and treat cause: consider hypovolemia, hypoxia, hydrogen ion, hypothermia, hypoglycemia, hypo/ hyperkalemia, cardiac and pulmonary thromboses, tamponade, tension pneumothorax, toxins, and trauma
2. Start IV or IO and administer epinephrine (0.01mg/kg of 1:10,000 or 0.1cc/kg)
3. If no response, administer fluid bolus of 20cc/kg NS
4. Check blood sugar. If less than 80:
    a. 2 ml/kg of 10% dextrose newborn-3 months
    b. 2 ml/kg of 25% dextrose if over 4 months and under 50 pounds
    c. 1 ml/kg of 50% dextrose for children over 50 pounds
5. Continue CPR and transport

Give epinephrine every 3 minutes during arrest

Altered Level of Consciousness

1. Secure airway and administer 100% O_2 via NRB. Intubate as necessary.
2. Apply monitor and check rhythm. If an arrhythmia is present, go to the appropriate pediatric cardiac protocol.
3. Start IV or IO (only if unconscious and unable to start IV) NS. Consider fluid challenge of 20cc/kg if patient appears dry and/or is hypotensive or poor capillary refill. Check patient's blood sugar. If less than 80:
   a. 2 ml/kg of 10% dextrose newborn-3 months
   b. 2 ml/kg of 25% dextrose if over 4 months and under 50 pounds
   c. 1 ml/kg of 50% dextrose for children over 50 pounds
   d. If blood sugar is >400 and signs of hypoperfusion are present, administer fluid bolus of 20cc/kg NS. Repeat in 10 minutes if blood sugar remains greater than 400 and patient remains unstable.
4. If blood sugar is within normal limits, respirations are impaired, or patient does not respond to dextrose or fluid bolus, administer Narcan 0.1mg/kg IV (patient <5 years old) or 2 mg IV (patient >5 years of age or more than 20kg in weight).
5. Re-evaluate patient condition. Contact Med Control and transport.

Note: ***In some cases patient may require restraint and should not be transported until completely restrained***

Consider c-spine injury

May repeat in 10 minutes if blood sugar remains less than 80

If patient improves somewhat after Narcan but not fully awake, contact Med Control for repeat dose

Child Abuse/ Neglect

General Considerations

1. Initiate treatment as necessary for situation using established protocols.
2. Remove child from scene, transporting to the hospital even if there is no medical reason for transport.
3. Advise parents to go to hospital
4. Carefully document all findings and report to physician at the hospital. Contact local law enforcement and advise.

DOCUMENT THIS NOTIFICATION

5. If parents refuse permission to transport, notify local law enforcement for appropriate recourse. If the patient is in immediate danger, let law enforcement handle the scene. Do not leave until law enforcement is on the scene.

DO NOT JEOPARDIZE YOUR SAFETY

Newborn Resuscitation

General Considerations

1. Body heat must always be maintained. Immediately after birth, wipe the baby dry and place in a warm environment. Maintain body heat:
   a. Cover the infant's head and place against the mother's skin. Cover both.
   b. During transport, maintain squad heat and keep infant warm with towels and/or blankets.
2. Always position the infant in the sniffing position (fold a towel to 1" thickness and place under infant's shoulders while supine). This will allow for an adequate open airway and drainage of secretions.
3. Suction the nose and mouth once the infant is born.
   a. If thick meconium is present, suction the mouth and nose thoroughly especially if the newborn is not vigorous. It may be necessary to visualize the trachea and suction the lower airway. If the infant is in respiratory distress, suction the lower airway by intubating and suctioning directly through the ET tube. If it is necessary to repeat suctioning, extubate the infant and re-intubate with a new tube. Lower airway suctioning is only done when thick meconium is present- watery or thin meconium does not require aggressive suctioning. Mechanical suctioning may be performed if a meconium adapter is available and the suction pressure does not exceed -100 mmHg or -136 cmH_2O. Bulb suctioning is preferred.
4. If drying and suctioning has not provided enough tactile stimulation, try flicking the infant's feet and/or rubbing the infant's back. If this stimulation does not improve the infant's breathing, a BVM may be necessary.
5. Avoid direct application of cool oxygen to the infant's facial area as this may cause respiratory depression due to a strong mammalian dive reflex immediately after birth.

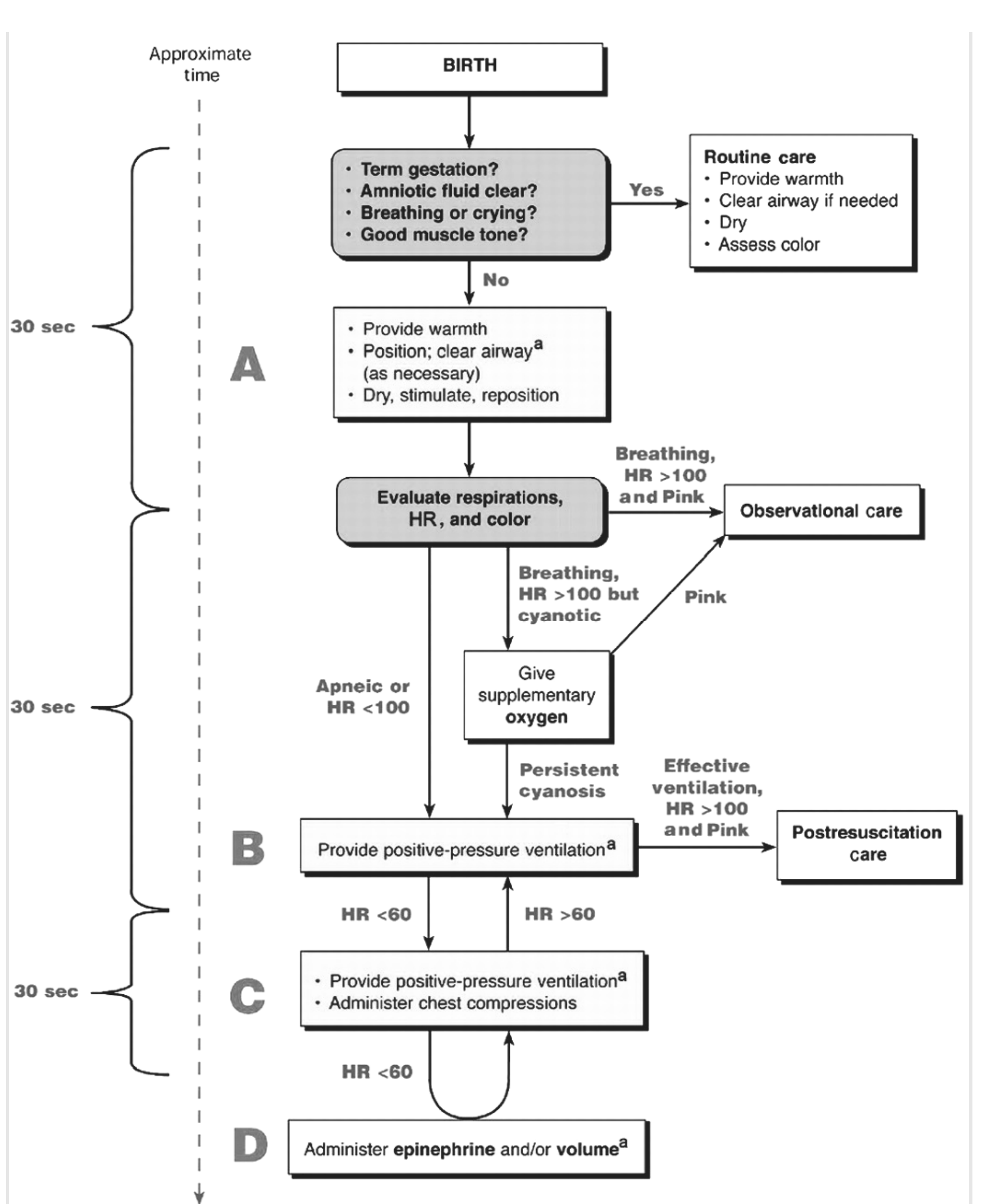
Meconium aspiration is a major cause of death and morbidity in the newborn. If thick meconium is present and not removed adequately, a high percentage (60%) of these infants will aspirate the meconium.

Refer to a Broslow Pediatric Emergency Tape when unsure about patient's weight, age, and/or drug dosage

Treatment

1. Suction airway during delivery. Continue suctioning after delivery with infant's head down until airway is clear and infant is breathing adequately.
2. Dry infant after delivery. Stimulate infant to breathe and keep warm.
3. Assess infant's respiratory and heart rates. Perform APGAR @ 1 minute and 5 minutes after birth. Prepare to suction if meconium present (see above).
4. If pulse is <100, BVM ventilation will be necessary to increase heart rate. Despite adequate ventilation, if heart rate <60, begin chest compressions. BVM ventilation is also indicated for apnea and persistent central cyanosis.
5. Apply monitor and check rhythm.
6. Start IV or IO
7. If asystole is present or heart rate is less than 60 despite adequate ventilation, administer epinephrine 0.01 mg/kg 1:10,000 (0.1 cc/kg). Repeat every 3 minutes as necessary.
8. If infant is hypovolemic, administer normal saline 10 cc/kg bolus IV over 5 minutes.
9. Consider Narcan administration if respirations are depressed *and* narcotic dependence is suspected (0.1 mg/kg repeated every 3 minutes until respirations improve).
10. Check blood sugar and administer 2 ml/kg of 10% dextrose if level is below 45.
11. Contact Med Control and advise of patient condition. Transport IMMEDIATELY.

Compression rates and compression/ventilation ratios should be performed in accordance with current AHA guidelines


Approximate time
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
30 sec
A
Provide warmth
Position; clear airway[a] (as necessary)
Dry, stimulate, reposition
Breathing, HR >100 and Pink
Evaluate respirations, HR, and color
Observational care
Breathing, HR >100 but cyanotic
Pink
Apneic or HR <100
Give supplementary oxygen
30 sec
Persistent cyanosis
Effective ventilation, HR >100 and Pink
B
Provide positive-pressure ventilation[a]
Postresuscitation care
HR <60
HR >60
30 sec
C
Provide positive-pressure ventilation[a]
Administer chest compressions
HR <60
D
Administer epinephrine and/or volume[a]

General Considerations

1. In children less than 3 years of age, open the airway using the sniffing position (fold a towel to 1" thickness and place under infant's shoulders while supine).
2. In newborns and infants, mechanical suction should not be used unless a meconium adapter is available. The suction pressure should not exceed -100 mmHg or -136 cmH_2O. Bulb suctioning is preferred.
3. In suspected cases of epiglottitis, DO NOT attempt to visualize the airway. Keep the patient calm and transport in an upright position.
4. If BVM is necessary, cricoid pressure can be applied to minimize gastric distention until the airway is secured.
5. Refer to the Broslow Pediatric Emergency Tape when unsure about the patient's weight, age, and/or drug dosage.

Treatment

1. Assess breath sounds and treat as follows:
    a. Airway open- absent breath sounds
        i. Begin bagging and consider endotracheal intubation
        ii. Provide 100% O_2 via BVM or PPV
        iii. Treat cause and transport
    b. Airway obstructed
        i. Try to visualize the obstruction with a laryngoscope if basic maneuvers are unsuccessful
    c. Spontaneous breathing with breath sounds
        i. Clear breath sounds- treat cause: fever, shock, dehydration, metabolic disturbance, hyperventilation
        ii. Wheezes
            1. Allergic reaction
                a. Administer 0.01 mg/kg (1:1,000) epinephrine IM in lateral thigh. Maximum dose is 0.3 mg (Or 0.01 cc/kg)
                b. If condition is caused by an insect bite or sting, apply ice pack to slow swelling and spread of poison
                c. Consider Benadryl 1mg/kg IM or IV if normotensive
                d. If no improvement, administer 0.01 mg/kg (1:10,000) IV push or repeat IM injection as above if no IV established (Or 0.1 cc/kg)
            2. Asthma
                a. Albuterol breathing treatment
                    i. If over 2 years of age- 1 unit dose (2.5 mg [3cc] via child aerosol mask over 10-15 minutes)
                    ii. If less than 2 years of age- ½ unit dose (1.25 mg [1.5cc] diluted with 2cc saline, via aerosol mask over 10-15 minutes)

d. Breath sounds asymmetrical or absent
    i. Spontaneous pneumothorax
        1. Provide oxygen and supportive care
    ii. Sucking chest wound
        1. Seal open wound and monitor for tension situation
    iii. Tension pneumothorax
        1. Perform chest decompression
e. Lower airway obstruction
    i. Place in position of comfort
    ii. Provide 100% O_2 via NRB

Pediatric Seizures

General Considerations

1. The seizure has usually stopped by the time EMS personnel arrive. The patient will usually be in a postictal state.
2. The basic rule with seizures is to “protect and support” the patient.
3. Aspiration precautions should include:
   a. Coma position- a side-lying position
   b. Suction readily available
   c. Clear mouth of foreign bodies (food, gum, etc.)

Treatment

1. Place patient away from objects that may cause injury; protect but do not restrain
2. Clear and maintain the airway

   Consider c-spine injury
3. Make sure patient has a good airway and provide 100% O_2 via NRB. In some cases it may be necessary to intubate
4. For suspected febrile seizures, remove clothing but DO NOT cool with water or alcohol
5. Apply monitor and check rhythm as necessary
6. If child is in a persistent epileptic state (status epilepticus), start an IV NS and contact Med Control for an order to administer Valium (diazepam) 0.2 mg/kg slow IV push over 3 minutes. May be repeated once if by Med Control order.

   By Med Control order ONLY
7. If seizure activity persists, check patient’s blood sugar and treat accordingly
   a. If blood sugar is less than 80, administer:
      i. 2 ml/kg of 10% dextrose newborn-3 months
      ii. 2 ml/kg of 25% dextrose if over 4 months and under 50 pounds
      iii. 1 ml/kg of 50% dextrose for children over 50 pounds

General Considerations

Shock can be caused by factors other than blood loss. Other factors include excessive vomiting and/or diarrhea, heat exposure, and malnutrition. While BP is usually a good indicator when evaluating a patient for possible shock, consider other signs such as low body temperature, poor capillary refill, decreased level of consciousness, increased heart rate, and/or poor skin color or turgor. Do not delay transport. Secure the airway on scene and transport immediately. Advanced procedures should be done en route if possible.

DO NOT RELY ON BLOOD PRESSURE

Treatment

1. Open and maintain the airway and provide 100% O_2 via NRB
2. Control all external bleeding and evaluate for internal hemorrhage and/or dehydration
3. Apply cardiac monitor and follow appropriate pediatric cardiac protocol
4. Identify type of shock and treat as follows:
    a. Hypovolemic, neurogenic, and septic shock
        i. Start an IV (IO if unconscious) NS and administer fluid bolus of 20cc/kg. May repeat bolus once if necessary

           Only if signs of hypoperfusion or dehydration are present (low BP, poor cap refill, poor skin turgor)
        ii. Check blood sugar. If blood sugar is less than 80, administer:
            1. 2 ml/kg of 10% dextrose newborn-3 months
            2. 2 ml/kg of 25% dextrose if over 4 months and under 50 pounds
            3. 1 ml/kg of 50% dextrose for children over 50 pounds
    b. Anaphylactic
        i. Respiratory distress
            1. Administer 0.01 mg/kg (1:1,000) epinephrine IM in lateral thigh. Maximum dose is 0.3 mg
            2. Administer Benadryl @ 1mg/kg IM or IV

               Especially indicated when drug reactions are suspected
            3. If wheezes are present and not cleared by epinephrine, administer Albuterol breathing treatment:
                a. If over 2 years of age- 1 unit dose (2.5 mg [3cc] via child aerosol mask over 10-15 minutes)
                b. If less than 2 years of age- ½ unit dose (1.25 mg [1.5cc] diluted with 2cc saline, via aerosol mask over 10-15 minutes)
        ii. Hives, itching, and/or swelling with normal BP
            1. Administer Benadryl @ 1mg/kg IM or IV

               Especially indicated when drug reactions are suspected

Normal Pediatric Vital Signs

Age Group	Respiratory Rate	Heart Rate	Systolic Blood Pressure
Newborn	30 - 50	120 - 160	50 - 70
Infant (1-12 months)	20 - 30	80 - 140	70 - 100
Toddler (1-3 yrs.)	20 - 30	80 - 130	80 - 110
Preschooler (3-5 yrs.)	20 - 30	80 - 120	80 - 110
School Age (6-12 yrs.)	20 - 30	70 - 110	100 - 120
Adolescent (13+ yrs.)	12 - 20	55 - 105	110 - 120

Pediatric Glasgow Coma Score

Eyes opening

Score	Age Group and Response: >1 year	Age Group and Response: <1 year
4	Spontaneously	Spontaneously
3	To verbal command	To shout
2	To pain	To pain
1	No response	No response

Best motor response

Score	Age Group and Response: >1 year	Age Group and Response: <1 year
6	Obeys	NA
5	Localizes pain	Localizes pain
4	Flexion withdrawal	Flexion normal
3	Flexion abnormal (decorticate rigidity)	Flexion abnormal (decorticate rigidity)
2	Extension (decerebrate rigidity)	Extension (decerebrate rigidity)
1	No response	No response

Best verbal response

Score	Age Group and Response: >5 years	Age Group and Response: 2--5 years	Birth to 23 months
5	Oriented and converses	Appropriate words and phrases	Smiles, coos, cries appropriately
4	Disoriented and converses	Inappropriate words	Cries
3	Inappropriate words	Cries and/or screams	Inappropriate crying and/or screaming
2	Incomprehensible sounds	Grunts	Grunts
1	No response	No response	No response

Pediatric Trauma Score

Category	+2	+1	-1
Size	> 20 kg	10-20 kg	< 10 kg
Airway	Normal	Maintainable	Not Maintainable
Systolic BP	> 90 mm Hg	50-90 mm Hg	< 50 mm Hg
CNS	Awake	Obtunded	Comatose
Open Wound	None	Minor	Major
Skeletal	None	Closed Fx	Open or Multiple Fx

> 8	< 1% Mortality predicted
< 8	Suggests need for trauma center
4	predicts 50% mortality
<1	predicts > 98% mortality

Note: If proper sized BP cuff is not available, BP can be assessed by assigning:
+2- pulse palpable at wrist
+1- Pulse palpable at groin
-1- No palpable pulse

Chest Decompression

General Considerations

The treatment of tension pneumothorax involves decompression of the affected chest cavity to release the pressure that has developed. Decompression can be achieved with minimal risk by inserting a 14-16 gauge needle into the second or third intercostal space at the midclavicular line. The needle must be inserted superior to the rib because the intercostal artery, vein, and nerve follow the inferior portion of the rib.

Indication

Signs and symptoms of tension pneumothorax :

- Diminished or absent lung sounds
- Cyanosis and difficulty breathing
- Distended neck veins
- Tachycardia, tachypnea, hypotension, narrow pulse pressure
- Tracheal shift to the unaffected side (not always present or may be late sign)

Procedure

1. Prepare equipment- 14-16g needle (intracath needle with stylet removed is preferred because sheath provides a one-way valve) and antiseptic solution. For pediatric patients (8 years old or less), use an 18g needle.
2. Locate site- second or third intercostal space at the midclavicular line
3. Prep site if time permits
4. Insert the needle and catheter just superior to the rib until a rush of air is felt and/or heard. Remove needle.
5. Secure catheter in place.
6. Support patient with 100% O_2 and transport without delay.

Contraindications

1. Insufficient training

Cricothyrotomy

Indications

1. Unable to intubate an adult or child over the age of 8 by another route. May be seen with:
    a. Cervical spine injuries
    b. Maxillo-facial trauma
    c. Laryngeal trauma
    d. Oropharyngeal obstruction from:
        i. Edema from infection, allergic reaction, and/or inhalation injuries
        ii. Foreign bodies
        iii. Mass lesion
    e. Oral or nasotracheal intubation contraindicated for any reason

Complications

1. Post-operative bleeding
2. Late bleeding
3. Abscess behind packing
4. Cellulitis of neck
5. Subcutaneous emphysema
6. Voice change
7. Feeling of lump in throat
8. Persistent stoma
9. Obstructive problems
10. Misplacement of the airway

Contraindications

1. Insufficient training

Surgical Cricothyrotomy Procedure

Familiarize yourself in advance with the procedure before utilizing the cricothyrotomy kit. Follow the manufacturer's recommendations with the following basic guidelines:

1. Make a 2-4cm vertical skin incision over the cricothyroid membrane (CTM)
2. Once the membrane has been exposed, make a 1.5-2cm horizontal incision into the membrane and through to the trachea. Maintain a slight caudal direction with the blade to avoid damage to the vocal cords
3. Use forceps or dilator provided in kit to spread the aperture in the CTM. Again, caution against vocal cord injury by angling the instruments caudally.
4. If time does not allow or equipment is not available, the blunt end of the scalpel can be placed in the incision and twisted to open the aperture.
5. Insert an appropriate size endotracheal tube (6mm tube). Advance caudally and inflate the balloon. When the tube is in place, check breath sounds and secure the tube.

Endotracheal Intubation

Indication

Endotracheal intubation is to be utilized for any victim with respiratory arrest and/or insufficient ability to maintain complete control of the airway. It protects the airway from aspiration of foreign material and allows for intermittent positive pressure ventilation to be achieved with 100% oxygen. It makes the trachea and respiratory tract available for suctioning and helps eliminate the problem of gastric distension.

Complications

1. Esophageal intubation
2. Tracheal rupture
3. Right mainstem bronchus intubation
4. Broken teeth
5. Laryngospasms
6. Trauma to the oral-pharynx
7. Trauma or puncture of the trachea due to misplacement of the stylet

Oral Intubation

1. Always begin ventilation as soon as possible using mouth-to-mouth, mouth-to-nose, or BVM
2. Assemble and ready equipment:
    a. Endotracheal tubes of various sizes
    b. Laryngoscope and blades
    c. Malleable stylet
    d. Magill forceps
    e. 10cc syringe
    f. Suction apparatus and catheters
    g. Water soluble lubricant
    h. ET tube tape
    i. Oropharyngeal airway
3. Lubricate tube
4. Assemble laryngoscope and check bulb
5. Place victim's head in sniffing position. Do not allow the head to hang over the end of the table or bed; the occiput of the head should be on the same horizontal plane as the back of the shoulders with the neck somewhat elevated.
6. Hold the laryngoscope in the left hand and insert the blade to the right of the midline. Move the tongue up and to the left with the blade stopping in the midline. Lift the handle straight up. This should give clear visualization of the glottic opening. Visualize the epiglottis and vocal cords.

   DO NOT PRY BACK ON THE TEETH
7. Suction the mouth and pharynx as needed.
8. Insert the proper size tube with the right hand, starting at the corner of the mouth, down into the trachea and past the vocal cords until the cuff disappears.
9. Remove the laryngoscope and stylet (if used), holding the tube securely with the right hand
10. Attempt to ventilate with mouth-to-tube or BVM and check for equal bilateral breath sounds. There should be no sounds over the abdomen. If breath sounds are heard on the right side of the chest but are diminished on the left, withdraw the tube slightly until the sounds are equal.

11. Inflate the cuff with 4-6cc of airway and secure in place. An Oropharyngeal airway may be used as a bite block if needed.
12. Maintain ventilation until adequate respirations resume or victim is delivered to an emergency department.
13. Recheck lung sounds and verify tube placement each time patient is moved or every 10 minutes.
14. Monitor pulse oximeter readings during and after intubation.
15. Document the intubation by noting the following:
    a. Number of attempts
    b. Person(s) making the attempts
    c. Size of tube
    d. Lung sounds before and after
    e. Pulse oximeter readings
    f. Any complications
16. Digital intubation is an acceptable method of intubation.

Nasal Intubation

1. Nasotracheal intubation may be used when the patient has an unprotected, inadequate airway creating hypoxia.
2. Nasotracheal intubation is indicated for:
    a. Patients with an inadequate respiratory status and all other methods of airway control and oxygenation were not effective.
    b. Trauma patients when c-spine manipulation must be kept to a minimum all other methods of airway control and oxygenation were not effective.
3. Contraindicated for patients with fractures of the face or base of the skull and any apneic patient.
4. Hazards include:
    a. Nasal hemorrhage and aspiration
    b. Laryngeal damage due to increased manipulation
    c. Rupture of cuff balloon
5. When attempting nasal intubation:
    a. Always begin basic airway control and oxygenation as soon as possible.
    b. Assemble and ready equipment:
        i. Endotracheal tubes of various sizes
        ii. 10cc syringe
        iii. Water soluble lubricant
        iv. Afrin® nasal spray
    c. Determine size of tube based on size of nasal opening
    d. Lubricate tube; seat 15mm adapter firmly
    e. Spray nostril with Afrin® nasal spray
    f. Holding tube with dominant hand, place thumb against the 15mm adapter
    g. Insert the tube into the right nostril and advance gradually, anterior to posterior, avoiding superior movement which can be met with resistance and causing injury

h. As the tube enters the pharynx, place your ear near the end of the tube and listen for breathing
i. When the patient takes a breath, advance the tube into the trachea
j. Listen for lung sounds and inflate the cuff. Begin bagging and confirm placement with breath sounds and end tidal CO_2 monitor
k. Do not attempt intubation for more than 30 seconds
l. If any resistance is encountered during insertion, abandon procedure and utilize another method of airway control and oxygenation
m. Monitor pulse oximetry during and after procedure
n. Recheck lung sounds and verify tube placement each time patient is moved or every 10 minutes
o. Document the intubation by noting:
    i. Number of attempts
    ii. Person(s) making the attempts
    iii. Size of tube
    iv. Lung sounds before and after
    v. Pulse oximeter readings
    i. Any complications

Tube sizing

The average size ET tube for a male is 8.0mm (ID) and for a female it is 7.5mm. For children the proper tube size is usually equal to the size of the child's little finger. The following guide will help to determine proper tube size:

Age	Size	Depth	Blade Size
Premature infant	2.5-3.0	8 cm	0 straight
Full term infant	3.0-3.5	8-9.5 cm	1 straight
Infant to 1 year	3.5-4.0	9.5-11 cm	1 straight
Toddler	4.0-5.0	11-12.5 cm	1-2 straight
Preschool	5.0-5.5	12.5-14 cm	2 straight
School Age	5.5-6.5	14-20 cm	2 straight
Adolescent	7.0-8.0	20-23 cm	3 straight or curved

All of the above tube sizes should depend on the child's size in consideration with age. Pre-pubescent children should have a cuffless tube; or if the tube has a cuff it should remain un-inflated.

Indications

A 12 lead EKG (ECG) may be useful in any patient with chest pain of suspected cardiac origin, patients with perfusing arrhythmias, or any patient with possible acute coronary syndrome (ACS).

Application

1. Follow the Acute Coronary Syndrome protocol.
2. Never delay care, especially oxygen, nitro, or aspirin; or transportation for the purpose of obtaining a 12 lead EKG.
3. With the patient in a semi-recumbent position apply the limb and chest leads.
4. Obtain EKG.
5. Interpret EKG for:
    a. Signs of myocardial infarction including q waves, ST segment elevation and T wave inversion
    b. Leads II, III, and aVF represent the inferior leads
    c. Leads V1-V4 represent the anterior leads
    d. Leads I and aVL and leads V4-V6 represent the lateral leads
    e. Arrhythmias
6. Notify the receiving hospital of all patients with chest pain of suspected cardiac origin regardless of EKG findings
7. Transmit EKG via telemetry from scene or en route if possible. Give EKG to nurse or physician upon arrival at ED.

External Pacemaker

Indications

An external pacemaker may be used in the following situations:

1. Patients with symptomatic bradycardia unresponsive to Atropine
2. Additional patients at the discretion of the on-line Medical Control Physician

Application

1. In the patient with symptomatic bradycardia, the rate is to be set at 80 beats per minute and the current is to be set at 60 milliamps. Increase in 20 milliamp increments every 10 seconds until capture is achieved.
2. Once electrical capture is obtained, check for pulse.
3. Use of an external pacer on a pediatric patient is by Med Control orders ONLY.
4. Nitroglycerin patches are to be removed before pacing.

Helmet Removal

Indications

Many helmets are of the partial variety (such as cycling or skate boarding helmets) and are easy to remove at the trauma scene. Some motorcycle and sports helmets fully enclose the head and are very difficult to remove in the field. They are also very difficult to secure to a spine board and do not hold the head firmly within, so when fixing the helmet to the spine board the head and neck are not fully immobilized. As a result, most full-enclosure helmets must be removed to insure adequate spinal immobilization.

The helmet must be removed if:

- The helmet does not immobilize the patient's head within
- You can not securely immobilize the helmet to the spine board
- The helmet prevents airway care
- The helmet prevents assessment of anticipated injuries
- There are, or you suspect, airway or breathing problems
- Helmet removal will not cause further injury

Procedure

1. If the helmet has a bladder, it must be deflated at the external ports before removal begins.
2. Person A stabilizes the c-spine by manually stabilizing the helmet.
3. Person B removes the face mask (if applicable) by unscrewing it or cutting it off, if possible.
4. Person B removes or cut the chin strap (do not manipulate the helmet).
5. Person B then immobilizes the head by sliding his or her hands under the helmet and placing them along the sides of the patient's head and supporting the occiput or placing one hand on the jaw and the other under the occiput.
6. Person A now grasps the helmet at the face or under the chin and gently tries to spread it apart as it is being removed. It may be necessary to rotate the helmet slightly to clear the chin, nose, brow ridge, and occiput.
7. If the helmet was a football helmet and the patient's shoulder pads remain, towels or blankets must be folded and placed under the head to prevent hyperextension. The shoulder pads can be removed before stabilization by cutting the strap and belt fasteners on the front of the chest.
8. Apply a cervical collar to the patient (it is more difficult to place a collar with the shoulder pads in place).

General Considerations
IVs will be started as allowed by each patient care protocol. IV placement must not delay transport of any critical patient involved in trauma. Generally, no more than 2 attempts or more than 5 minutes should be spent attempting an IV. If unable to initiate the IV line, transport patient and notify the receiving hospital that the IV was not able to be started. IVs may be started on any patient regardless of age providing there are adequate veins and that the patient's condition warrants an IV. Blood draws for hospital laboratory testing should be done providing the procedure would not jeopardize the IV line.

IV Solution
0.9% Sodium Chloride will be the only fluid used in the pre-hospital setting under this protocol. Sodium Chloride solution is provided in 250ml bags, multi-dose vials for saline locks, and 1000ml bags for fluid replacement..

IV Tubing
The following tubing will be used for this protocol:

- For all adult fluid lines, use regular (macrodrip) administration set tubing
- For child and infant patients, use 60 drop set (microdrip) and extension tubing
- For patients requiring IV access but not fluid replacement, use a saline lock

Mechanics for Starting a Peripheral IV

1. Prepare equipment
2. The initial attempt should be the dorsum of the hand. Further attempts should proceed to the forearm
3. Apply tourniquet
4. Cleanse site
5. Insert IV into appropriate vein
6. Attach IV tubing
7. Secure IV using appropriate measures to ensure stability of the line
8. Check for signs of infiltration
9. Adjust flow rate
10. Document IV procedure on EMS report

Mechanics for Starting an External Jugular IV Line

1. Locate external jugular vein
2. Cleanse site
3. Select IV catheter
4. Position yourself at patient's head
5. Turn patient's head to maximize exposure to vein and minimize jaw interference
6. Direct needle caudally at an angle nearly parallel to the neck
7. Attach IV tubing and secure using appropriate measures to ensure stability
8. Check for signs of infiltration
9. Adjust flow rate
10. Document IV procedures on the EMS report

Mechanics of Starting a Saline Lock

1. Prepare equipment
   a. Attach pre-pierced adapter to extension tubing
   b. Inject saline (app. 1cc) into tubing
   c. Leave syringe attached to tubing
2. The initial attempt should be the dorsum of the hand. Further attempts should proceed to the forearm. The antecubital fossa should not be used for saline locks.
3. Apply tourniquet
4. Cleanse site
5. Select catheter
6. Attach IV tubing and flush with 2cc saline through the tubing and catheter. Remove syringe.
7. Secure lock using appropriate measures to ensure stability
8. Check for signs of infiltration
9. Document procedure on EMS report

Central Line Use (i.e., Broviak, Kickman, PICC, NOT MEDIPORT)

1. IN AN EXTREME EMRGENCY ONLY SHOULD THESE CATHETERS BE CONSIDERED FOR USE
2. Cleanse the catheter end with alcohol or povodine-iodine prep and flush with 10cc saline. Should resistance be felt with the irrigation, DO NOT attempt to force further or give any medications.

Documentation

All IV attempts must be recorded on the run sheet and include the following:

1. When successful:
   a. Type of IV solution
   b. Flow rate
   c. Size of catheter or needle used
   d. Initials or numbers of all medics who attempted and/or started IVs
   e. Any complications
2. When unsuccessful:
   a. Size of catheter or needle used
   b. Location of attempted site
   c. Initials or numbers of all medics who attempted IV
3. Record all IV medications and solutions given:
   a. Name of medication
   b. Dosages and amount given
   c. Time ordered (if applicable)
   d. Time given
   e. Initials or numbers of all medics who administered medication

Intraosseous Infusion

Indications

- To establish parenteral means to administer fluids and parenteral medications
- May be used in any instance in which an IV route would be appropriate
- Its use should be considered after three IV attempts have failed or 90 seconds of attempts at a peripheral site
- This procedure is indicated for all ages in cardiopulmonary arrest, profound shock, or traumatic arrest

Recommended sites:
Infacts and children- proximal tibia
Adults- sternum

Complications

Intraosseous infusions of fluid may cause subcutaneous infiltration, osteomyelitis, or subcutaneous infections

Contraindications

- Osteomyelitis or cellulitis at the proposed site
- Fracture in the tibia
- Previous IO attempt at the proposed site

Equipment

1. Intraosseous needle
2. Betadine or alcohol
3. IV setup
4. Syringe

Procedure for proximal tibia insertion

1. Prepare the site. The preferred site in children is the proximal anteromedial tibia, 1-3cm below the tibial tuberosity.
2. Needle insertion varies between 70° and 90° angle to the skin surface, approximately 1-2 finger widths distal to the tibial tuberosity. With a straight push and/or rotary motion, push the needle through the subcutaneous tissue and bone until a drop or pop is felt.
3. The needle should feel firm in position and stand upright without support.
4. The infusion, under pressure, should flow freely without evidence of subcutaneous infiltration.
5. Infusion via this route is the same as venous access without limit to rate of administration, drugs used, or IV fluid type infused.
6. After removing the needle (for successful or unsuccessful attempt), apply pressure to the area for 5 minutes and apply a dressing.
7. An alternate site in adults is the sternum, following the same procedure as above.

Pneumatic Anti-Shock Garment (PASG)

Indication

- Immobilization of suspected pelvic fracture
- Control of massive hemorrhage of lower extremities

Contraindications

- Acute cases of pulmonary edema
- Pregnancy- do not inflate the abdominal section
- Cardiogenic shock
- Open wounds of the chest

Application

1. Unfold PASG completely and lay on a stretcher or backboard
2. Put patient on the PASG face up (supine) so that the top of the garment will be just below the last rib
3. Wrap the left leg first, then the right, then the abdomen. Each leg should be snug and all Velcro® should be fastened. Following this sequence will facilitate quicker application.
4. Check the victim's vital signs and breath sounds. If symptoms of blood loss are present, inflate the PASG. Attach the foot pump at the calves and inflate each section, starting with the leg sections, until:
    a. The patient's systolic BP reaches 100
    b. Velcro® fasteners crackle
    c. Air escapes through the safety valves
    d. Bleeding stops
5. If using as a splint, inflate only until the garment is firm
6. Close valves, leave hoses and pump attached for transport

Removal

PASG's should not be deflated until:

1. A physician is present and has taken charge of the patient *and*
2. Fluids are available for transfusion

Note- The urge to deflate the garment to inspect the wounds should be suppressed. Electrocardiograms and x-rays can be taken and Foley catheters can be inserted while the PASG is on and inflated. In cases where bleeding is initially present, or hypovolemia is suggested by evident external blood loss, the PASG should not be deflated until replacement therapy has begun. Deflation before volume replacement may lead to further, profound shock. If the situation permits, gradual deflation with concurrent fluid administration is advisable.

General Considerations

Pulse oximetry is used in conjunction with other assessment processes to determine the actual available oxygen in the blood. Pulse oximetry measures the oxygen saturation of the red blood cells (%SpO_2). Studies have shown that EMS personnel are fairly accurate in the assessment and treatment of patients in profound hypoxia. However in mild to moderate hypoxic states EMS personnel sometimes do not react until the patient has progressed to profound hypoxia. Signs of progressive hypoxia need to be identified rapidly and the condition treated before profound hypoxia occurs. Use of pulse oximetry in conjunction with other assessment processes may sometimes identify those patients in mild to moderate hypoxia, and with proper intervention profound hypoxia can be prevented. If available, pulse oximetry should be used on all patients. It should be maintained and evaluated until the patient is delivered to the Emergency Department.

Initiate normal airway and oxygenation support regardless of the availability of pulse oximetry

Never base any treatment or oxygen therapy solely on the reading from the pulse oximeter

Procedure

1. Select sensor and apply according to the manufacturer's recommendations
2. Turn oximeter on and verify operation according to the manufacturer's operating procedure
3. A relative operation check can be achieved by applying the sensor to your own finger
4. Always cleanse the sensor site of blood and dirt for reliable readings. Some fingernail polishes may have to be removed to obtain a reading

Interpretation

Reading	*Condition*	*Treatment*
96%-100%	Ideal range	Maintain oxygen and airway support methods being used
90%-95%	Mild to moderate hypoxia	Check airway and increase oxygen support until ideal range is achieved
85%-89%	Severe hypoxia	Aggressive airway & oxygen support is essential. Identify and treat cause, i.e. COPD, metabolic imbalance, peripheral vascular shutdown
Less than 85%	**Be prepared to intubate and/or assist ventilation**	

Considerations

1. Hypovolemic, hypothermic, and peripheral vascular disease patients may not be suitable candidates for pulse oximetry due to peripheral shutdown
2. A pulse must be detected by the oximeter to determine the %SpO_2
3. Pulse oximetry is not indicated in carbon monoxide (CO) poisoning or other poisoning that binds with hemoglobin causing a displacement of O_2
4. COPD patient will normally have a low %SpO_2 and should not be treated in accordance with this guideline

Be aware that there may be a 30-60 second delay between changes in SpO_2 conditions and pulse oximeter readings

Intubating LMA™ and Combitube™

Indication

Intubating LMA™ or Combitube™ is to be utilized for any victim with respiratory arrest and/or insufficiency as a backup rescue airway when attempts at endotracheal intubation have failed. Both have been shown to be adequate during cardiac arrest.

Complications

- Unable to oxygenate and ventilate
- Tracheal rupture
- Right mainstem bronchus intubation
- Broken teeth
- Laryngospasms
- Trauma to the oral-pharynx
- Does not protect against aspiration unless the trachea is intubated

Combitube™ Procedure

1. Begin by providing BVM ventilation until ready to proceed
2. Blindly insert the Combitube™ advancing gently until resistance is felt
3. Inflate the distal cuff and ventilate the distal tube by BVM. If breath sounds are heard bilaterally with no abdominal sounds, confirm with CO_2 monitoring device. This will confirm that the trachea has been intubated.
4. If no breath sounds are heard in the lung fields and sounds are heard over the abdomen, inflate the proximal balloon and ventilate via the proximal tube/ esophageal perforations. Confirm lung sounds.
5. If in doubt about your ability to oxygenate and ventilate using the Combitube™, remove the device and continue BVM ventilation until arrival at the hospital.

Intubating LMA™ Procedure

1. Begin by providing BVM ventilation until ready to proceed
2. Blindly insert the intubating LMA™ advancing gently until resistance is felt
3. Inflate the cuff on the LMA™, ventilate by BVM, and listen for breath sounds. If breath sounds are heard bilaterally continue ventilation until ready to insert the special ET tube with the ILMA™ kit. If no breath sounds are heard, repeat steps 1 and 2 until breath sounds are heard.
4. Once breath sounds are heard, insert the specialized ET tube via the LMA™. Confirm breath sounds with a CO_2 monitoring device in the same manner as endotracheal intubation.
5. If in doubt about your ability to oxygenate and ventilate using the LMA™, remove the device and continue BVM ventilation until arrival at the hospital.

Mass Casualty Incident

General Considerations

There are four types of mass casualty incidents that could occur in the WeShare community. They are:

1. Fire MCI- these incidents strain the area of fire equipment/ manpower and strip EMS resources
2. EMS MCI- this is primarily a victim driven situation. Fire resources/ equipment remain adequate
3. Police MCI- little to no fire/ EMS resources are needed
4. Hazmat MCI- fire equipment/ resources may be utilized. EMS may be involved to some degree

Estimate the number of victims as early as possible. As a rule of thumb, one ambulance needed per 2-3 victims (1 critical, 1 moderately injured, 1 walking wounded)

WeShare and surrounding communities can provide up to 10 ambulances

Incident Levels

1. Level 1 EMS
   a. 4-8 victims
   b. 2-5 ambulances needed
   c. Few fire resources needed
2. Level 2 EMS
   a. Small to moderate size EMS event
   b. 8-30 victims
   c. 6-10 or more ambulances needed
3. Level 1 Fire
   a. Most of the host and surrounding city's manpower will be required to mitigate the incident.
   b. Approximately 4-8 victims
   c. 2-5 ambulances will be needed from more distant WeShare/ mutual aide cities
4. Level 2 Fire
   a. Likely to become Level 3 MCI
5. Level 3
   a. Large scale. Institute Cuyahoga County Mass Casualty Plan.
   b. Notify Cecoms via dispatch (216.771.1363) or by radio on Hear channel 3 or 4

Special Considerations

- Bring MCI kits and command bags
- Notify dispatch of resources needed (Incident Level)
- Establish command post. Appoint section chiefs and branch directors. Wear identifying vests.
- Designate safety officer
- Notify Chief officers and MCI staff officer
- Notify Safety Director and Mayor
- Have dispatch notify local hospitals if Level 1 or Level 2
- Have dispatch notify Cecoms if Level 3
- Determine hot, warm, and cold zones
- Assign police to secure area including command post and staging area
- Consider Aeromedical transportation (Lifeflight 3; UH 2)
- Use "START" triage program
- Activate Hazmat Team if necessary
- First in squad(s) should assume key positions, not transport (triage)

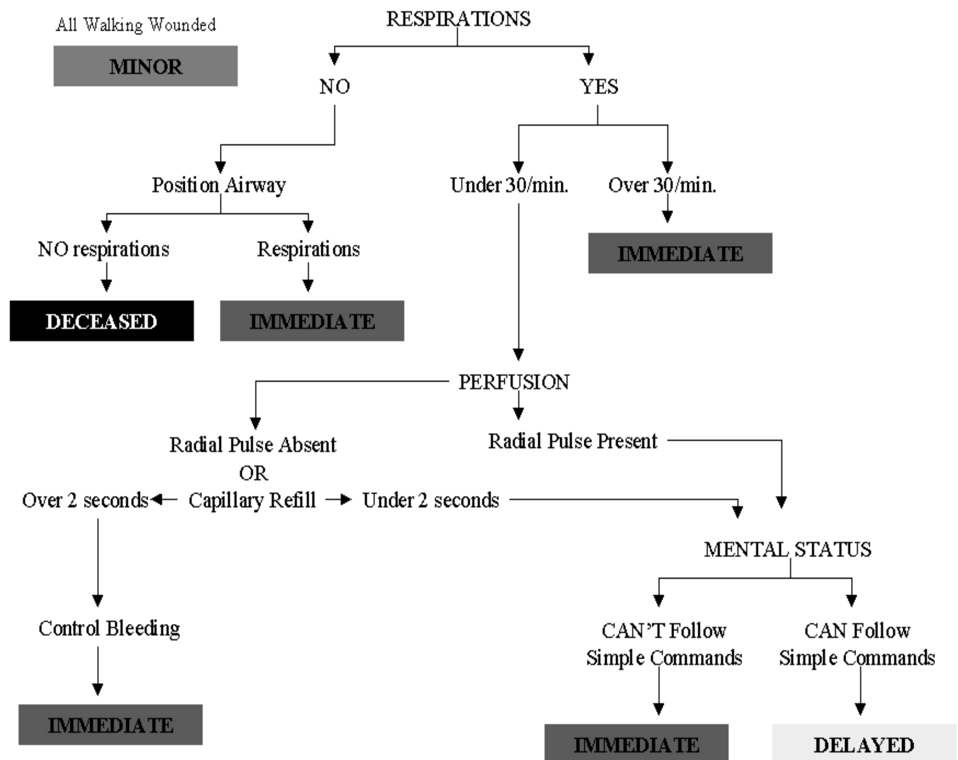
Greatest Good for the Greatest Number!

Assign initial resources appropriately. Scene safety first, consider hose line, control utilities, etc. before triage

"Start" Triage System

Start is an acronym for Simple, Triage and Rapid Transport. It focuses on the following signs or symptoms:

- Ability to walk
- Respiratory Effort
- Pulses/ Perfusion
- Neurological status



Nerve Agent Exposure Protocol Mark-1 Kit/ NAAK

Indications

Exposure to nerve agents

Initial Actions

1. If the presence of a nerve agent is suspected by presentation of symptoms or by a large number of patients, personnel should immediately contact dispatch to notify other responding units and command staff.
2. Follow departmental decontamination and PPE protocols as required

Treatment for Adults

1. No symptoms- decontamination and observation only
2. Mild symptoms (muscle twitching and diaphoresis) - the paramedic may administer **1 (one) MARK 1 kit.**
3. Moderate symptoms (miosis, rhinorrhea, headache, wheezing, GI effects and muscle weakness) - the paramedic may administer **one (1) to 2 (two) MARK 1 kits.**
    a. The paramedic may repeat atropine 2 mg autoinjector IM every 5-10 minutes until secretions discontinue
4. Severe symptoms (unconscious, seizures, flaccid, apnea) - the paramedic may administer **three (3) MARK 1 kits.**
    a. The paramedic may repeat atropine 2 mg auto injector IM every 5-10 minutes until secretions discontinue
    b. The paramedic may administer **diazepam 10mg IM autoinjector or 5-10 mg IV** for any seizure activity related to nerve agent exposure.

Treatment for Pediatric Patients (age > 10 or 40 kg)

1. No symptoms- decontamination and observation only
2. Mild symptoms (miosis, mild rhinorrhea)- decontamination and observation only
3. Moderate to severe symptoms (miosis and <u>any other symptom of nerve agent exposure</u>)
    a. **Atropine 0.05 mg/kg IV or IM**
        i. Repeat every 5-10 minutes until respiratory status improves
        ii. MAX DOSE- 4 mg
    b. **Pralidoxime (if available) 25-50 mg/kg IV or IM**
        i. May repeat every 1 hour
        ii. MAX DOSE- 1200 mg
        iii. Watch for muscle rigidity, laryngospasm, tachycardia
    c. If any seizure activity is present, administer **diazepam:**
        i. Age 30 days to 5 years- 0.05- 0.3 mg/kg IV or IM
            1. MAX DOSE- 10 mg
        ii. Age >5 years- 0.05- 0.3 mg/kg IV or IM
            1. MAX DOSE- 30 mg
        iii. Monitor respiratory status closely following administration of diazepam

All paramedics must complete the Mark 1 nerve agent antidote administration course taught through their local departmental training officer or medical control facility

Taser Patients

General Considerations IF CALLED BY LAW ENFORCEMENT

- All patients subjected to taser use must be transported to an appropriate medical facility for evaluation. However, they must be transported to a trauma center if they meet any of the Major Trauma Triage Criteria, have penetrating eye trauma, or an unstable airway.
- All patients subjected to taser use must be assessed for trauma and for medical causes for the combative behavior.
- The patient's vital signs must be reassess every 5 minutes
- Try to determine if the patient has used any mind altering stimulants, has a cardiac history, and the date of their last Tetanus shot
- Do NOT remove the probes/ barbs
- The cord or wire may be cut if the probes/barbs are left embedded in the patient
- Apply cardiac monitor and oxygen as per protocol
- Obtain an EKG if the patient complains of chest pain as per protocol

Transport to Free Standing E.D.

General Considerations

1. Patients with minor ***single*** extremity injuries that are not likely to require operative care or admission may be transported
2. Patients over the age of 50 with medical complaints should ***NOT*** be transported to a free standing ED
3. Patients under the age of 50 with minor medical complaints may be considered for transport ***except*** the following:
   a. Patients with symptoms suggesting significant cardiac, stroke, and/or neurological conditions (i.e. meningitis) and/or symptoms requiring surgical intervention
   b. Patients who are unstable and/or acutely ill with grossly abnormal vital signs
   c. Other conditions that are likely to require a significant medical/ surgical workup and/or admission to the hospital (pregnancy, respiratory complaints, new onset back pain, unusual headache, etc.)
4. No trauma patients as defined in this protocol should be transported to a free standing ED
5. Medical Control should be contacted for a decision for any case where the paramedic needs clarification or requests advice

Purpose

This section will discuss the medications and their pharmacology used in the WeShare EMS Protocol and Procedures Manual.

Pharmacology Review

1. Actions of drugs
    a. Local effects
    b. Systemic effects
2. Effects depends upon:
    a. Age of patient
    b. Condition of patient
    c. Dosage
    d. Route of administration
3. Route of administration
    a. Intravenous (IV)/ intraosseous (IO)
        i. Most rapidly effective
        ii. Most dangerous
        iii. Give SLOWLY through an established IV line
    b. Intramuscular (IM)
        i. Takes longer to act
        ii. Longer duration of action
        iii. Deltoid or gluteous maximus site
        iv. Absorption very dependent on blood flow
    c. Subcutaneous (SQ)
        i. Slower and more prolonged absorption
        ii. Under skin or upper arms, thigh, abdomen
    d. Inhalation
        i. Bronchodilators
        ii. Steroids
    e. Endotracheal (ET)
        i. Epinephrine, atropine, lidocaine, Narcan
            1. Dilute usual IV dose with 10cc sterile water
    f. Sublingual (SL)
        i. Rapid absorption
    g. Oral
        i. Ipecac, charcoal
    h. Rectal
        i. Rapid but unpredictable absorption
    i. Intracardiac
        i. Dangerous
        ii. No advantage over IV or ET routes
        iii. Dilute usual IV dose with 10cc sterile water
4. Rates of Absorption
    a. Directly related to route of administration
        i. IV- fastest
        ii. IM
        iii. SQ
        iv. Oral- slowest

5. Elimination
    a. Many methods
    b. Most drugs metabolized by the liver
    c. Eliminated by the kidneys, lungs, skin
6. Terms
    a. Indications- conditions drugs used for
    b. Contraindications- conditions drugs not used for
    c. Depressants- lessens/ decreases activity
    d. Stimulant- increases activity
    e. Physiologic action- action from normal body amounts of drug
    f. Therapeutic action- beneficial action expected
    g. Untoward reaction- harmful side effect
    h. Irritation- damage to tissue
    i. Antagonism- opposition between effects of drugs
    j. Cumulative action- increased action after several doses
    k. Tolerance- decreased effects after repeated doses
    l. Synergism- combined effects greater than sum of parts
    m. Potentiation- enhancement of one drug by another
    n. Habituation- drug necessary for feeling of well being
    o. Idiosyncrasy- Unexpected abnormal response to a drug
    p. Hypersensitivity- exaggerated response, allergy
7. Autonomic Nervous System
    a. Controls automatic or involuntary actions
        i. Parasympathetic- controls vegetative functions
        ii. Sympathetic- fight or flight
8. Parasympathetic Nervous System
    a. Mediated by vagus nerve
    b. Acetylcholine is transmitter (cholinergic)
    c. Atropine is acetylcholine blocker
9. Sympathetic Nervous System
    a. Mediated by nerves from sympathetic chain
    b. Norepinephrine is transmitter (adrenergic)
    c. Epinephrine is released from adrenals
10. Sympathetic Receptors
    a. Alpha (a)
    b. Beta (b)
11. Common Sympathetic Agents
    a. Isoproterenol (Isuprel)- pure beta
    b. Epinephrine (Adrenalin)- predominately beta
    c. Dobutamine (Dobutrex)- predominately beta, slight alpha
    d. Norepinephrine (Levophed)- predominately alpha
    e. Dopamine (Intropine)- Beta at low dose; alpha at high dose
    f. Metaraminol (Aramine)- predominately alpha
    g. Phenylephrine (Neo-Synephrine)- pure alpha

12. Sympathetic Blockers
    a. Propranolol (Inderal)- beta blocker
13. Appropriate Drug Administration
    a. Indication
    b. Order
    c. Dose
    d. Observation
    e. Dilution
    f. Route
    g. Rate

Adenosine (Adenocard)

Therapeutic Effects: Adenosine slows tachycardias associated with the AV node via modulation of the autonomic nervous system without causing negative inotropic effects. It acts directly on sinus pacemaker cells and vagal nerve terminals to decrease chronotropic and dromotropic activity. Adenosine is the drug of choice for paroxysmal Supraventricular tachycardia (PSVT) and can be used diagnostically for stable, wide-complex tachycardias of unknown type after two doses of lidocaine.

Indications: Conversion of SVT to sinus rhythm

Contraindications:
- Second or third degree block
- Atrial flutter
- Atrial fibrillation
- Ventricular tachycardia
- Hypersensitivity to adenosine

Side Effects:
- Facial flushing
- Lightheadedness
- Paresthesia
- Headache
- Diaphoresis
- Palpitations
- Chest pain
- Hypotension
- Shortness of breath
- Nausea
- Metallic taste

How Supplied: 6 mg/2 ml and 12 mg/4 ml vials or prefilled syringes

Adult Dosage: Initial dose- 6 mg rapid IV push over 1-3 seconds immediately followed with a 20cc saline flush

Repeat dose- If no response is observed after 1-2 minutes, administer 12 mg rapid IV push over 1-3 seconds immediately followed with a 20cc saline flush

Pediatric Dose: Initial dose- 0.1 mg/kg rapid IV push over 1-3 seconds immediately followed with a 10cc saline flush

Repeat dose- If no response is observed after 1-2 minutes, administer 0.2 mg/kg rapid IV push over 1-3 seconds immediately followed with a 10cc saline flush

Albuterol (Proventil/ Ventolin)

Therapeutic Effects: Beta-2 stimulator; dilates smooth muscle; bronchodilator

Indications: Shortness of breath caused by bronchoconstriction

Contraindications: Allergy to the drug
Excessive prior use of beta stimulants
Shortness of breath not from bronchoconstriction

Side Effects: Nervousness
Weakness
Tremor
Increased heart rate

How Supplied: Unit dose 2.5 mg vials (3ml)

Administration: By inhalation through a breathing aerosol device

Adult Dosage: 2.5 mg in NS via aerosol device with oxygen @8 lpm

Pediatric Dosage: Age 1-3 years: 1.25 mg in 2.5 cc NS
Over age 3: 2.5 mg in NS via aerosol device with O_2 @8 lpm

Amiodarone HCL (Cordarone IV)

Therapeutic Effects: Blocks sodium, potassium, and calcium channels; is a non-competitive alpha and beta-adrenergic inhibitor; prolongs repolarization and refractory periods by increasing the action potential duration.

Indications: Amiodarone HCL is indicated for initiation of treatment and prophylaxis of frequently recurring VF and hemodynamically unstable v-tach in patients refractory to other therapy (VF and pulseless VT)

Contraindications: Contraindicated in patients with known hypersensitivity to any components of Amiodarone HCL; or in patients with cardiogenic shock, marked sinus bradycardia, or 2nd or 3rd degree AV block unless a functioning pacemaker is available.

Side Effects: Hypotension, bradycardia, and AV blocks are the most common side effects. Other adverse reactions include asystole/cardiac arrest/ electromechanical dissociation, cardiogenic shock, CHF and ventricular tachycardia

How Supplied: Glass ampules containing 150 mg in 3 ml (50mg/ml). These should be stored at room temperature and be protected from light and excessive heat

Administration: Given by IV bolus during the acute event. CAN NOT be injected down the ETT. A supplemental IV infusion of Amiodarone HCL can be administered after the acute event has been stabilized and a pulse has returned.

Adult Dosage: Amiodarone 300 mg IV push followed by 150 mg bolus every 3-5 minutes until a perfusing cardiac rhythm returns at which time a supplemental infusion of Amiodarone HCL 150 mg in 100cc NS can be initiated and infused over a 10 minute period. Cumulative dose: 2.2 grams over 24 hours

Pediatric Dosage: Amiodarone HCL 5 mg/kg IV or IO push. MAY REPEAT UNTIL A PERFUSING CARDIAC RHYTHM OCCURS WITH A MAXIMUM OF 15 MG/KG PER DAY

Other: Amiodarone HCL infusions that exceed 2 hours MUST be administered in glass or polyolefin bottles containing NS. Avoid shaking the ampules as this causes foaming which is the result of the surfactant properties. The ampules are overfilled to assure availability of adequate volume. Amiodarone HCL is incompatible with AMINOPHYLLINE, HEPARIN, and SODIUM BICARBONATE. It also interacts with Coumadin, Digoxin, Quinidine, Pronestyl, and various other oral medications. In cases of cardiac arrest, this is not a consideration

Aspirin

Therapeutic Effects: Aspirin exhibits analgesic, anti-inflammatory and antipyretic activity. Due to aspirin's ability to inhibit platelet aggregation and cause vasodilatation, there is a decreased likelihood of thrombosis.

Indications: Cardiac related chest pain

Contraindications: Aspirin hypersensitivity; active or history of GI lesions; impaired renal function

Side Effects: GI bleeds; mucosal lesions; bronchial spasm in some asthma patients

How Supplied: 80 mg chewable or 325 mg coated tablets

Administration: Orally

Adult Dosage: 160-325 mg

Atropine Sulfate

Therapeutic Effects: By blocking the parasympathetic (vagal) action on the heart, atropine increases the rate of discharge by the sinus node, enhances conduction through the AV junction, and accelerates the heart rate, thereby improving cardiac output. In addition, by speeding a slow heart to a normal rate, atropine reduces the chances of Ectopic activity in the ventricles and thus of ventricular fibrillation. Atropine is most effective in reversing bradycardia due to increased parasympathetic tone or to morphine; it is less effective in treating bradycardias due to actual damage to t he AV or SA node.

Indications:
Sinus bradycardia WHEN ACCOMPANIED BY HYPOTENSION
Second or third degree block when accompanied by bradycardia
In some cases of asystole to remove any type of heart block
As an antidote in organophosphate poisoning.

Contraindications:
Atrial flutter or atrial fibrillation when there is a rapid ventricular response
Glaucoma- narrow angle
Use with extreme caution in myocardial infarction

Side Effects: The patient should be warned that they may experience some of the following side effects and that these side effects are part of the drug's usual and expected actions: blurred vision, headache, papillary dilatation, dry mouth, thirst, flushing of the skin

How Supplied: Prefilled syringes containing 1 mg in 10 ml

Administration: In the field, atropine is usually given intravenously for bradycardia.
For organophosphate poisoning, a combination of intravenous and intramuscular administration is commonly used.

Adult Dosage: **Bradycardia- 0.5 mg IV push**; repeat in 5 minute intervals until the desired heart rate is achieved. The total dose should not exceed 3.0 mg or 0.04 mg/kg. Doses smaller than 0.5 mg or doses given too slowly may have the opposite effect causing the rate to slow even more. Excessive doses may precipitate VT or VF.
Asystole- 1 mg IV push; may repeat in 5 minutes if asystole persists. Max of 3.0 or 0.04 mg/kg
Organophosphate Poisoning- 2 mg IM and 1 mg IV. The IV dose may be repeated every 5-10 minutes as needed until a decrease in secretions is observed.

Pediatric Dosage: **Bradycardia- 0.02 mg/kg IV push.** May be repeated one time.
Minimum dose- 0.1 mg
Maximum dose- 0.5 mg in children/ 1.0 mg in adolescent

10% Dextrose (D10)

Therapeutic Effects: Restores circulating blood sugar level to normal in states of hypoglycemia
Acts transiently as an osmotic diuretic

Indications: When blood sugar reading is below 80
To treat coma caused by hypoglycemia
Some cases of refractory cardiac arrest

Contraindications: Intracranial hemorrhage

Side Effects: Will cause tissue necrosis if it infiltrates; should therefore be given only through a good, rapidly flowing IV line

How Supplied: Prefilled syringes and vials containing 10 ml of 10% dextrose

Administration: Given intravenously through a free-flowing IV line preferably in a large vein. If possible, draw blood for serum glucose levels before administering the dextrose

Pediatric Dosage: For newborns to age 3 months- 2 ml/kg of D10

25% Dextrose (D25)

Therapeutic Effects: Restores circulating blood sugar level to normal in states of hypoglycemia
Acts transiently as an osmotic diuretic

Indications: When blood sugar reading is below 80
To treat coma caused by hypoglycemia
To treat coma of unknown cause
To treat status epilepticus of uncertain cause
Some cases of refractory cardiac arrest

Contraindications: Intracranial hemorrhage

Side Effects: Will cause tissue necrosis if it infiltrates; should therefore be given only through a good, rapidly flowing IV line

How Supplied: Prefilled syringes and vials containing 10 ml of 25% dextrose (= 2.5g of dextrose)

Administration: Given intravenously through a free-flowing IV line preferably in a large vein. If possible, draw blood for serum glucose levels before administering the dextrose

Pediatric Dosage: 2 ml/kg in children older than 3 months and under 50 pounds
NOT TO BE GIVEN TO NEWBORNS

50% Dextrose (D50)

Therapeutic Effects: Restores circulating blood sugar level to normal in states of hypoglycemia
Acts transiently as an osmotic diuretic

Indications: When blood sugar reading is below 80
To treat coma caused by hypoglycemia
To treat coma of unknown cause
To treat status epilepticus of uncertain cause
Some cases of refractory cardiac arrest

Contraindications: Intracranial hemorrhage or suspected stroke with normal or elevated blood sugar

Side Effects: May precipitate severe neurologic symptoms in alcoholics. For this reason, when given to a known alcoholic, it should be accompanied by Thiamin (50 mg IV and 50 mg IM) which will prevent this neurologic syndrome.
Will cause tissue necrosis if it infiltrates; should therefore be given only through a good, rapidly flowing IV line

How Supplied: Prefilled syringes and vials containing 50 ml of 50% dextrose (= 25g of dextrose)

Administration: Given intravenously through a free-flowing IV line preferably in a large vein. If possible, draw blood for serum glucose levels before administering the dextrose

Adult Dosage: 50 ml of 50% dextrose (25g) as a bolus IV

Pediatric Dosage: 1 ml/kg in children over 50 pounds
Mix 1:1 with normal saline to make 25% solution and give 2 ml/kg in children under 50 pounds

Diazepam (Valium)

Therapeutic Effects: Through its depressant action on the central nervous system, it can terminate some seizures. Also has a calming effect in anxiety

Indications: To treat status epilepticus
Given as a sedative prior to cardioversion in conscious patients and during external pacing if needed

Contraindications: Patients with allergies to benzodiazepines
Should not be given to patients who have taken alcohol or other sedative drugs
Should not be given to patients with respiratory depression from any source
Should not be given to patients with hypotension

Side Effects: Possible hypotension
Confusion; stupor
In some patients, especially the elderly, the very ill, and those with pulmonary disease, it may cause respiratory arrest and/or cardiac arrest

How Supplied: In prefilled syringes and ampules of 2 ml and in vials of 10 ml, in a concentration of 5 mg/ml

Administration: Given intravenously in slow, titrated doses or intramuscularly in severe anxiety
Before administering the drug, check and record the patient's vital signs

Adult Dosage: Status Epilepticus- give 5 mg (1.0 ml) slow IV. Wait a few minutes and recheck the B/P. If it has fallen, do NOT give any more of the drug. If B/P remains stable and the desired therapeutic effect has not been achieved, administer another 2.5 mg (0.5 ml) IV. Recheck B/P. Continue until the seizures have stopped of the B/P drops but do NOT exceed a total dose of 10 mg in the field.
For severe anxiety that must, for some reason) be treated in the field, give 2.5-5.0 mg IM or IV

Pediatric Dosage: 0.2 mg/kg slow IV push/IO (over 3 minutes); maximum dose is 5 mg
Rectally- n0.5 mg/kg with a catheter to a maximum of 10 mg

Diphenhydramine HCL (Benadryl)

Therapeutic Effects:
Blocks histamine effects
Sedative
Reverses untoward effects of some phenothiazine tranquilizers
Inhibits motion sickness (antiemetic)

Indications:
As an adjunct to epinephrine in the treatment of anaphylactic shock and severe allergic reactions
To treat extrapyramidal reactions (Parkinson-like movement disorders) caused by phenothiazines

Contraindications:
Asthma
Narrow angle (acute) glaucoma
Prostate enlargement
Ulcer disease with symptoms of obstruction
Pregnancy

Side Effects:
Similar to Atropine:
Drowsiness/ confusion
Blurring of vision
Dry mouth
Wheezing; thickening of bronchial secretions

How Supplied:
In vials of 10 or 30 ml containing 10 mg/ml
In vials of 10 ml containing 50 mg/ml
In ampules of 1 ml containing 50 mg/ml
In prefilled syringes containing 50 mg in 1 ml

Administration: For most purposes, diphenhydramine can be given deep IM or IV push

Adult Dosage: 25-50 mg IV or IM

Pediatric Dosage: 1 mg/kg IM or IV to a max of 50 mg

Epinephrine (Adrenalin)

Therapeutic Effects: May restore electrical activity in asystole; increases myocardial contractility; decreases the threshold for defibrillation due to its actions as a beta sympathetic agent. In addition, the alpha effects cause vasoconstriction, elevate the perfusion pressure and may improve coronary blood flow during chest compressions. In anaphylaxis, it acts as a bronchodilator (beta effect) ad helps maintain blood pressure (alpha effect).

Indications:
Helps to restore electrical activity in asystole
Enhances defibrillation potential in VF
Elevates systemic vascular resistance and thereby improve perfusion pressure during resuscitation
To treat life threatening symptoms of anaphylaxis
To treat acute attacks of asthma

Contraindications:
Must be used with caution in patients with angina, hypotension, or hyperthyroidism
THERE ARE NO CONTRAINDICATIONS IN CARDIAC ARREST OR ANAPHYLACTIC SHOCK

Side Effects:
In a conscious patient, may cause palpitations from tachycardia or ectopic beats and elevations in B/P which may not be desirable if the patient is already hypertensive.
The asthmatic with preexisting heart disease may experience dysrhythmias if treated with epinephrine

How Supplied:
Prefilled syringes containing 1 mg in 10 ml (1:10,000 solution)
Ampules containing 1 mg in 1 ml (1:1,000 solution)
Multi-dose vial: 30 mg in 30ml (1:1,000 solution)

Administration:
Epinephrine is administered every 3-5 minutes throughout cardiac arrest
For anaphylactic reactions, it is given subcutaneously (SQ)

Adult Dosage:
Cardiac Arrest: 1.0 mg (10 ml of 1:10,000 solution) IV
Anaphylactic Reactions: 0.3 mg subcutaneously (0.3 mg of 1:1,000 solution)
Severe Reactions with Shock: 0.3 mg SLOW IV (3 ml of 1:10,000 solution)
Mild to Moderate Asthmatic Attacks: 0.3 mg SQ (0.3 mg of 1:1,000 solution)

Pediatric Dosage:
Bradycardia: 0.01 mg/kg 1:10,000 every 3 minutes
Cardiac Arrest: 0.01 mg/kg 1:10,000 IV push of IO every 3 minutes
Newborn Cardiac Arrest: 0.02 mg/kg 1:10,000 IV or IO every 5 minutes
Allergic Reaction/ Asthma: 0.01 mg/kg 1:1,000 SQ to a max of 0.3 mg. If no response and IV in place, 0.1 mg/kg 1:10,000 IVP

Furosemide (Lasix)

Therapeutic Effects: Potent diuretic causing the excretion of large volumes of urine within 5-30 minutes of administration, thus useful in ridding the body of excess fluid in conditions such as congestive heart failure (CHF).
Not often used in the field when the distance to the hospital is short
May be useful in long range transports of patients in marked heart failure (especially catheterized patients) where there is a need to begin definitive therapy before the patient arrives at the hospital.

Indications: To reverse fluid overload associated with congestive heart failure and pulmonary edema

Contraindications: Should not be given to pregnant women
Should not be given to patients with hypokalemia (low potassium)
Hypokalemia may be suspected in a patient who has been on chronic diuretic therapy or whose EKG shows prominent P waves, diminished T waves, and the presence of U waves

Side Effects: Immediate side effects may include nausea and vomiting, potassium depletion (with attendant cardiac dysrhythmias), and dehydration

How Supplied: Prefilled syringes of 10 ml in a concentration of 10mg/ml

Administration: In the field, furosemide is given via IV

Adult Dosage: 40-80 mg SLOW IV (over 1-2 minutes)

Pediatric Dosage:

Glucagon

Therapeutic Effects: Accelerates the breakdown of glycogen to glucose in the liver causing an increase in blood glucose level
Also relaxes smooth muscle of the GI tract
It is helpful in hypoglycemia only if the liver glucagon is available because glucagon is of little or no help in states of starvation, adrenal insufficiency, or chronic hypoglycemia.

Indications: For the treatment of hypoglycemia when IV dextrose is not available
In known anaphylaxis if the patient is on beta blocking medication, hypertensive, has known coronary artery disease and/or is pregnant

Contraindications: Is contraindicated in patients with known hypersensitivity to the drug or in patients with pheochromocytoma

Side Effects: It is relatively free of adverse reactions except for occasional nausea and vomiting which may occur with hypoglycemia
Generalized allergic reactions include urticaria, respiratory distress, and hypotension have been reported in patients who have received glucagon by injection

How Supplied: Vials of 1 mg glucagon with 1 ml of diluting solution

Administration: For adults and children over 20 kg, administration may be SQ, IM, or IV
It must be constituted with dilution solution provided and used immediately
It is compatible with dextrose solutions but precipitates may form in solutions of sodium chloride, potassium chloride, or calcium chloride

Adult Dosage: In hypoglycemia, 0.5- 1.0 mg SQ or IM injection. Response is usually seen in 5-20 minutes. If response is delayed, dose may be repeated 1-2 times.

Pediatric Dosage: In hypoglycemia for children more than 20 kg, 0.5- 1.0 mg SQ or IM injection. Response is usually seen in 5-20 minutes. If response is delayed, dose may be repeated 1-2 times.

Lidocaine (Xylocaine) 2%

Therapeutic Effects: Suppresses ventricular ectopic activity by decreasing the excitability of heart muscle and the cardiac conduction system

Indications:
To suppress premature ventricular contractions (PVC)
To prevent ventricular fibrillation in acute myocardial infarction
To prevent recurrence of ventricular fibrillation after electric conversion
To treat ventricular tachycardia

Contraindications:
Known history of allergy to lidocaine or local anesthetics (i.e., Novocain)
Second or third degree heart block
Sinus bradycardia or sinus arrest
Idioventricular rhythm

Side Effects:
By decreasing the force of cardiac contractions as well as decreasing peripheral resistance, it may cause a fall in cardiac output and B/P
May cause numbness, drowsiness, or confusion when given in high doses, especially to the elderly patients
In patients with heart failure, may cause seizures

How Supplied: Ampules and prefilled syringes containing 100 mg in 5 ml (20 mg/ml) for bolus injection

Administration:
Given by IV bolus
Reduce the dosage (both bolus and infusion) by half for patients in congestive heart failure or shock and for patients over 70 years of age\

Adult Dosage: 1-1.5 mg/kg IV push followed by 50 mg bolus every 20 minutes, Maximum dose is 3.0 mg/kg

Pediatric Dosage: For resuscitation of VF, initial dose is 0.01 mg/kg IV; subsequent doses 0.1 mg/kg IV or IO

Morphine Sulfate

Therapeutic Effects: Decreases pulmonary edema by pooling blood in the peripheral circulation and thereby reducing venous return to the heart.
Helps as well to allay the anxiety associated with pulmonary edema.
Potent analgesic for painful conditions

Indications: To treat pulmonary edema associated with congestive heart failure (CHF)
To relieve pain in myocardial infarction and other selected conditions

Contraindications: Marked hypotension
Respiratory depression, except that caused by pulmonary edema where the drug may be used if ventilatory support is provided

Side Effects: Hypotension (most likely in volume depleted patients)
Increased vagal tone, leading to bradycardia (can be reversed with atropine)
Respiratory depression (can be reversed with Naloxone)
Nausea and vomiting

How Supplied: Prefilled syringes containing 10 mg

Administration: Given by titrated intravenous injection
If hypotension occurs, keep the patient flat and stop drug administration. Watch for respiratory depression

Adult Dosage: 2-4 mg IV push every 5-30 minutes until the desired therapeutic effect is achieved. DO NOT EXCEED 15 MG IN THE FIELD

Pediatric Dosage:

Naloxone (Narcan)

Therapeutic Effects:

Specific antidote for narcotic agents
Reverses the actions of all narcotic drugs including heroin, morphine, methadone, codeine, Demerol, Dilaudid, Darvon, paregoric, and Percodan. Naloxone is thus effective in counteracting the effects of overdose from any of these agents.
It will reverse stupor, coma, respiratory depression, etc. when these are due to narcotic overdose.

Indications:

To treat known narcotic overdose or coma suspected to be due to narcotic overdose

Contraindications:

None

Side Effects:

Too rapid administration may precipitate projectile vomiting and ventricular dysrhythmias.
Administration to people who are physically dependent on narcotics may cause an acute withdrawal syndrome. For this reason, it should be given very slowly, using improvement of respiratory status as an end point.
In general, the duration of action of Naloxone is shorter than that of the narcotics it is used to counteract. Thus the patient who has been successfully roused with Naloxone may fall back into stupor or coma as the Naloxone wears off. These patients must therefore be watched closely and the dose of Naloxone should be repeated as necessary.
Has been reported to cause pulmonary edema and sudden death in rare cases.

How Supplied:

2 mg in 2 ml prefilled syringes

Administration:

In the field, it should be given by slow IV injection. As soon as there is improvement in the respirations, stop giving the drug.
It is preferable that the patient NOT wake up fully in the field as these patients may be violent when brought abruptly out of coma.
USE RESPIRATIONS AS A GUIDE
If there is no response to 2 doses, suspect overdose with another non-narcotic drug.

Adult Dosage:

initial dose- 2 mg. Administer this solution very slowly IV while monitoring the rate and depth of the patient's respirations.
If there is no response to the full dose of Naloxone, it may be repeated in 5 minutes in the same fashion.

Pediatric Dosage:

Newborn dose- 0.1 mg/kg (narcotic dependent with decreased respiration). Repeat every 3 minutes until respirations improve.

Nitroglycerin

Therapeutic Effects: The primary pharmacologic effect of nitroglycerin and related drugs is to relax smooth muscle, and the effects of nitroglycerin on the cardiovascular system are chiefly due to relaxation of vascular smooth muscle (hence vasodilatation). It provides relief of pain in angina, probably by dilating coronary arteries and thereby increasing blood flow through them as well as by decreasing myocardial oxygen demand. Through its vasodilatation action on peripheral vessels, nitroglycerin promotes pooling of the blood in the systemic circulation and decreases the resistance against which the heart has to pump (the afterload); these effects may be useful in treating congestive heart failure.

Indications:
To relieve the pain of angina.
To treat selected cases of pulmonary edema due to left heart failure

Contraindications:
Use with caution in myocardial infarction.
Increased intracranial pressure
NOT TO BE ADMINISTERED TO PATIENTS WHO HAVE TAKEN ERECTILE DYSFUNCTION MEDICATION IN THE LAST 36 HOURS

Side Effects:
Transient, throbbing headache
Hypotension
Dizziness, weakness

How Supplied:
Many forms, including ointment, spray, tablets, sustained release capsules
For use in the field, tablets of 0.4 mg strength are preferred

Administration:
Given sublingually (under tongue)
The patient should be semi-sitting or recumbent
Monitor blood pressure and be prepared for hypotension

Adult Dosage:
One 0.4 mg tablet or spray under the tongue.
May repeat once every five minutes as long as B/P stays normal

Pediatric Dosage:

Oxygen

Therapeutic Effects: Reverses the deleterious effects of hypoxemia of the brain, heart, and other vital organs

Indications: Any condition in which global or local hypoxemia may be present:

- Cardiac or respiratory arrest
- Chest pain
- Coma (from any cause)
- Near- drowning
- Toxic inhalations (smoke, chemicals, CO)
- Acute decompensation of COPD
- Head injury
- Any patient in critical condition
- Dyspnea or respiratory distress (any cause)
- Shock
- Chest trauma
- Pulmonary edema
- Acute asthma attack
- Stroke
- Repeated seizures

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

Side Effects: None when given for short periods to adults (less than 24 hours)

How Supplied: As a compressed gas in cylinders of varying sizes

Administration: Administered by inhalation from a dosage mask, nasal cannula, endotracheal tube, etc. A patent airway and adequate ventilation must be assured.

Adult/ Pediatric Dosage: Depends on the condition being treated. For cardiac arrest and other critical conditions, 100% oxygen should be given as soon as possible.

Oxymetazoline (Afrin)

Therapeutic Effects: Alpha antagonist which causes nasal decongestion

Indications: Prior to nasal intubation to decrease the risk of epistaxis and trauma to nasal mucosa

Contraindications: Allergy to alpha antagonists
Narrow angle glaucoma
Use with caution in patients with hypertension and cardiac disease

Side Effects: Headache, palpitations, hypertension

How Supplied: 0.05% solution for intra-nasal use

Administration: 2 sprays or drops of solution into nares prior to intubation attempt

Adult Dosage:

Pediatric Dosage:

Sodium Bicarbonate

Therapeutic Effects: By neutralizing excess acid, it helps return the blood towards a physiologic pH in which normal metabolic processes and sympathomimetic agents (such as epinephrine) work more effectively.

Indications: To treat metabolic acidosis, as in:
Shock and other low-output states (after resuscitation from cardiac arrest)
To treat hyperkalemia (high serum potassium)
To promote the excretion of some types of drugs taken in overdose

Contraindications: Conditions in which the patient cannot tolerate a salt load, such as congestive heart failure

Side Effects: Because each mEq of bicarbonate comes with a mEq of sodium, it has the same effect as any other salt-containing infusion, i.e., it increases the vascular volume.
Three 50 ml syringes of sodium bicarbonate (1 mEq/ml) contain approximately the same amount of salt as 1 liter of normal saline.
Patients in borderline heart failure cannot tolerate salt loads of this magnitude.

Sodium bicarbonate lowers serum potassium. In some cases this is the desired effect, as when bicarbonate is used to treat hyperkalemia. However, in cardiac patients, if the potassium falls too low, the heart becomes irritable and dysrhythmias may occur. This is especially likely in patients taking diuretics.
Sodium bicarbonate administration transiently raises the arterial carbon dioxide level, thus administration must be accompanied by controlled hyperventilation to blow off this excess CO_2 (e.g., with a bag-valve-mask).

How Supplied: Vials and prefilled syringes of 50 ml, containing 1 mEq/ml

Administration: Given by IV bolus injection

Adult Dosage: Cardiac arrest: if used at all, 1 mEq/kg after the first minutes of CPR. Acidosis should thereafter be prevented by hyperventilation.
Do not give bicarbonate in the same syringe with epinephrine or calcium

For other conditions: as ordered by medical control

Pediatric Dosage: Cardiac arrest: 1 mEq/kg diluted with 1 ml/kg NS. For newborns, 0.5 mEq/kg diluted with 0.5 ml/kg NS

Sodium Chloride (0.9% Normal Saline Solution)

Therapeutic Effects: Increases vascular volume and replaces lost fluids

Indications:
To treat volume loss from any cause
To maintain open IV access
To irrigate wounds

Contraindications: None

Side Effects: Fluid overload in patients intolerable to large amounts of IV fluids (CHF patients or patients with chronic renal failure)

How Supplied: IV solution in bags, ampules for mixing medications, pour bottles for irrigation

Administration: IV injection per specific protocol

Adult Dosage:

Pediatric Dosage:

Tetracaine (Pontocaine, Ophthalmic)

Therapeutic Effects: Provides local anesthesia to eyes.
Provides relief from eye pain so that an appropriate eye exam and treatment can be completed.

Indications: Irritation and/or pain of the eyes when there is a non-penetrating injury

Contraindications: Penetrating or open eye injury.
Allergy or hypersensitivity to Tetracaine.

Side Effects: Burning sensation in eyes
Redness
Tearing

How Supplied: Ophthalmic drops in dropper bottle

Administration: 1-2 drops in affected eye every 5-10 minutes as needed for pain control. Do not touch dropper tip to eye, led, or finger to keep bottle sterile.

Adult Dosage:

Pediatric Dosage:

Aeromedical Transport

General Considerations

Due to the nature of any call, aeromedical transport may be placed on stand-by during the dispatch phase to alert them of a potential need for their services.

Procedure for Summoning Aeromedical Transport

1. Assess patient and/or scene
2. Institute appropriate treatment and/or extrication (follow Trauma or Medical protocols)
3. Arrange aeromedical transport when:
    a. Serious trauma meets Trauma Center admission criteria, where ground transport exceeds air response and transport times
    b. Serious injury or illness in a site/location not easily accessible to land vehicles but where an adequate clearing for helicopter landing is near
    c. Mass casualty incident where the number of victims exceeds ground transport capacity

EMS Unit Has On-Line Medical Direction And The Aeromedical Team Has A Physician Present

1. Until the patient becomes the full responsibility of the flight physician, the on-line physician is responsible. If there is any disagreement between the flight physician and the on-line physician, the EMS personnel must only take orders from the on-line physician and place the flight physician in radio or telephone contact with the on-line physician.
2. Once care of the patient is turned over to the aeromedical team, patient care responsibility rests with the flight physician.
3. The receiving hospital should be determined in consultation between the on-line physician and the flight physician.

The determination of which hospital will receive the patient will be made by the patient or his/her designee except in life-threatening emergencies. In this case, the decision will be made by EMS personnel in conjunction with on-line medical direction. Requests to transport patients outside the region will be subject to intra-departmental policy.

Phone lines, either standard or cellular, are the preferred route for communicating patient information. If unable to contact the receiving hospital by this method, secondary access is via CECOMS radio or relay of information through the department dispatch center.

General Communication

1. Identify the unit calling
2. State if urgent or non-urgent traffic
3. Announce destination and ETA
4. Give patient's age and sex
5. Give the chief complaint
6. Give a summary of the history
7. Relay past medical history, allergies, and medication pertinent o the chief complaint
8. Give vital signs. Give repeat vital signs if they have changed
9. Give a summary of the physical findings
10. Give the treatments you have initiated and response to treatment
11. Request additional orders as you feel appropriate

A member of the prehospital care team must contact Medical Control at the earliest time conducive to good patient care. This may mean that the hospital is contacted from the scene if assistance is needed in the patient's immediate care or permission is required for part of the patient care deemed necessary by the paramedic or EMT in charge.

When possible, the member of the team most knowledgeable about the patient should be the one calling the report.

Although all EMT's and paramedics have been trained to give a full, complete report, this is often not necessary and may interfere with the physician's duties in the Emergency Department. Reports should be as complete but concise as possible to allow the physician to understand the patient's condition. It is not an insult for the physician to ask questions after the report is given. This is often more efficient than giving a thorough report consisting mostly of irrelevant information.

If multiple victims are present on the scene, it is advisable to contact Medical Control with a preliminary report. This should be an overview of the scene, including the number of victims, seriousness of the injuries, estimated on-scene and transport times to the control hospital or possible other nearby facilities. This allows preparation for receiving the victims and facilitates good patient care.

Protocol for DOA

General Considerations

When a DOA is encountered, the squad members should avoid disturbing the scene or the body as much as possible unless it is necessary to do so the care for and assist other victims. Once it is determined that the victim is, in fact dead, the squad members should move as rapidly as possible to transfer responsibility or management of the scene to the Police Department and/or Coroner's Office. It is the squad member's responsibility to notify the Coroner's Officer directly or to ensure that the Coroner's Officer has been notified by a police officer on the scene.

A determination that the victim is dead rests with the squad members. Any of the following may be used as guidelines to support the determination that a victim is deceased:

1. There is an injury which is incompatible with life (i.e., decapitated or burned beyond recognition)
   a. Cardiac arrest, secondary to massive blunt trauma without signs of exsanguinating hemorrhage (i.e., limb amputation)
2. The victim shows signs of decomposition, rigor mortis, or dependent lividity
3. If the patient is an adult with an unwitnessed cardiac arrest, has a history of an absence of vital signs for greater than 20 minutes, and is found in asystole not secondary to hypothermia or cold water drowning.
4. If the patient is an infant or child with an unwitnessed cardiac arrest and is found in asystole, except:
   a. In hypothermic patients with a downtime of less than 30 minutes
   b. In cold water drowning if recovered in less than 1 hour
5. If there are valid DNR (Do Not Resuscitate) orders, see DNR protocol
6. If the patient has a history of terminal disease, the family refuses resuscitation and permission to pronounce the patient dead is given by Medical Control

NOTE: **If any doubt exists that the victim is dead at the time of arrival of the squad, resuscitative measures should be instituted immediately. Whenever resuscitative measures are instituted, they must be continued until arrival at the hospital or until a physician has pronounced the victim dead.**

Do Not Resuscitate/ Support Care Guidelines

General Considerations

Prehospital (out of hospital) providers are called to care for patients who are known to have incurable or terminal illnesses on an ever increasing basis. Examples of such patients include those with metastatic cancer, AIDS, and severe CVA's. Many patients, and/or their families, have intelligently and consciously altered their consent for treatment, made out a living will, or entered into Hospice care agreements.

EMS providers and medical control physicians often find these encounters confusing, frustrating, and charged with emotion. This is especially true when there is no prearranged document or consistent, rational or standardized approach by which to care for these patients and their families.

These guidelines are designed to help EMS providers and medical control physicians determine how, when, and to what level of resuscitation a patient desires or requires. A newer "pro-active" approach is to refer to DNR as SUPPORT care. Ohio ACEP and EMS Board are actively working to develop and pass into law a State of Ohio SUPPORT Care (DNR) policy.

Definition

DNR orders are defined to withhold CPR and Advanced Life Support from patients suffering from terminal illness. A DNR order may be written with specific guidelines such as Comfort Care only or Full Medical Management with various "check list" treatment modalities (e.g., medications, blood products, tube feedings), but if ***not*** otherwise noted implies ***not*** initiating or continuing the following: CPR, intubation, advanced airway management, manual or mechanical ventilatory support, electrical monitoring or therapy, and administering ACLS drugs.

DNR orders to not mean "DO NOT TREAT"

Prehospital providers and medical control physicians must be sensitive to and actively involved with the administration of other palliative and supportive care interventions, such as making the patient comfortable, pain relief, and allaying the patient's and family's fear and apprehension.

Other interventions may, but not necessarily include: oxygen administration, suctioning the airway, IV fluids, control bleeding, splinting, position of comfort, contacting a private hospice physician or nurse, and transport of the patient to a hospital.

Action/ Identification

The procedure or action by which a healthcare provider identifies a patient with a DNR/Support Care order is usually by one of three (3) methods:

1. A valid DNR/Support Care document is present
2. The patient, guardian or family refuses care
3. The patient is wearing a DNR/Support Care bracelet/ID

Valid DNR/Support Care orders are characterized by:

1. A properly signed, witnessed, and written document
2. It is dated within two (2) years
3. It is written by a physician or nurse
    a. If written by a nurse and not countersigned by a physician:
        i. The order must include the physician's name
        ii. It must state that it is a verbal or telephone order
        iii. The order must be less than two (2) weeks old
        iv. The patient must be a nursing home or Hospice patient
    b. If there is no written order, but a physician requests the patient be made DNR, the physician should directly contact Medical Control. Continue caring for the patient until a clarification of the patient's DNR status can be determined.

The following minimum data should be included on the EMS Run Sheet:

1. Name, gender, age
2. Attending/Hospice physician's names
3. Date, time, location of run
4. Event, description, history
5. Assessment: vitals, physical exam
6. Treatment if applicable
7. Revocation if applicable

Revocation

A DNR/Support Care patient may revoke their status at any time by:

1. Direct communication with the prehospital provider
2. The private physician is directed by the patient, guardian, or family member to revoke the order. This must be either by written or direct verbal order. This scenario may occur when the patient cannot communicate with the EMS provider.

Accompaniment

It is imperative that a copy of, or the original, DNR/Supportive Care order accompany the patient wherever the patient goes. This policy will help prevent confusion about, or inappropriate initiation of advanced care modalities for any terminally ill patient.

General Considerations

Patient initiated refusal for treatment or transportation may be granted by the following procedure for patient refusal. Prehospital providers should not initiate the refusal.

Consent

1. The patient has the responsibility and right to consent to or refuse treatment. If he or she is unable to do so, a legal guardian has this right.
2. A durable power of attorney is an authorization that allows a patient's wishes to be followed even when he/she becomes incompetent.
3. In no event should legal consent procedures be allowed to delay immediately required treatment.
4. In non-emergency cases involving minors, consent should be obtained from the parent or legal guardian prior to undertaking any treatment. All children must be evaluated for acuity of illness, regardless of obtaining parental consent.
5. Age- Patient must be 18 years of age or older or "emancipated" to be permitted to consent or refuse treatment. A child under 18 years of age who is married or is living away from home and is financially independent of his/her parents may consent for their own care and may consent to medical or surgical care for his/her child.
6. If the patient is under age, consent should be from:
    a. Legal guardian
    b. Natural parent
    c. Adopted parent

Note: There has not been a single reported decision that held a physician liable where beneficial care was provided to a minor without obtaining consent

Mental Competence- Decision Making Capability

1. A person is mentally competent if he/she:
    a. Is capable of understanding the nature and consequences of the proposed treatment
    b. Has sufficient emotional control, judgment, and discretion to manage his/her own affairs
2. Ascertaining that the patient is oriented, has an understanding of what happened and may possibly happen if treated or not treated, and a plan of action- such as whom he/she will call for transportation home- should be adequate for these circumstances.
3. Patients with impaired cerebral perfusion, in shock, postictal, or under the influence of drugs will be unlikely to fulfill these criteria.
4. If the patient is not mentally competent under these guidelines, consent should be obtained from another responsible party who must also be mentally competent and must be at least 21 years of age in the following order of preference:
    a. Legal guardian
    b. Spouse
    c. Adult son or daughter
    d. Parent
    e. Adult brother or sister
    f. If the patient is not mentally competent and none of the above persons can be reached, the person should be treated and transported to a medical facility. It is preferable under such circumstances to obtain concurrence of a police officer in this course of action.
    g. If the patient is not competent to consent and a legal guardian as defined above is present, and if that person is competent, he/she has the same right to consent or refuse treatment as the patient themselves. Those wishes cannot be ignored in a life-threatening situation.

Non-transport for Minors with Injury or Illness
If after evaluation of a minor the EMT feels that the patient has a trivial injury or minor illness that does not require emergency medical attention, that minor can be left in the care of a responsible adult that is not the parent or legal guardian. The responsible adult may be a family friend, neighbor, school bus driver, teacher, school official, police officer, social worker, or other person at the discretion of medical control and the EMT.

Note: if any doubt exists about a patient's competency to refuse or their ability to understand the risks of refusal, Medical Control should be contacted. Additionally, if the EMS Refusal Checklist demonstrates any abnormalities of patient assessment, the case should be discussed with Medical Control.

Procedure for Refusal
If a patient wishes to refuse treatment, examination, or transportation, the following steps will be taken:

1. The EMT will complete a Patient Refusal Checklist (see example). Medical Control will be contacted if any abnormalities are noted in the refusal checklist.
2. This contact and the orders given by the medical control physician must be documented. If unable to contact medical control, document "Why".
3. The patient must be advised of the benefits of treatment and transport as well as the specific risks of refusing treatment and transport.
4. The patient must be able to relate to the EMT in his/her own words what these risks and benefits are.
5. The patient will be provided with a refusal information sheet (see attached). A copy of this refusal information sheet or the refusal section of the checklist will be signed by the patient, dated, and both will be kept with the patient's file.
6. If questions arise, don't hesitate to contact Medical Control for guidance.

EMS Patient Refusal Checklist

Assessment of patient

Alcohol/Drug Ingestion Per History Or Exam ☐ Yes ☐ No
Altered Level Of Consciousness ☐ Yes ☐ No
Head Injury ☐ Yes ☐ No
Oriented to ☐ Person ☐ Place ☐ Time ☐ Situation

Medical Control

Contacted via ☐ Phone ☐ Radio ☐ Unable to contact Time___________

☐ Unable to contact Medical Control Physician_______________________

☐ Indicated treatment/ transport may be refused by patient
☐ Use reasonable force/ restraint to provide treatment
☐ Use reasonable force and/or restraint to transport
☐ Other (explain)____

If medical control not able to be contacted, explain in comment section of checklist

Patient Advised

☐ Medical treatment/evaluation needed
☐ Ambulance transport needed
☐ Further harm may result if no medical treatment or evaluation
☐ Transport by means other than ambulance may be hazardous in light of patient's present illness or injury
☐ Patient provided with refusal advise sheet
☐ Patient would not accept refusal sheet

Disposition

☐ Refused all EMS services
☐ Refused transport/ accept field treatment
☐ Refused field treatment, accept transport
☐ Released in care or custody of self
☐ Released in custody of law enforcement

Agency______________________________ Officer_________________________________
☐ Released in care or custody of relative or friend

Name_____________________________ Relation________________________________

Comments____

____

____

EMT Signature______________________________ Date_______________ Time________________

Officer____________________________________ Date_______________ Time________________

Refusal information Sheet

This form has been given to you because you have refused treatment and/or transport by the Emergency Medical Service. Your health and safety are our primary concern, so even though you have decided not to accept our advice, please remember the following:

1. The evaluation and/or treatment provided to you by the EMS squad is not a substitute for medical evaluation and treatment by a physician. We advise you to get medical evaluation and treatment.
2. Your condition may not seem as bad to you as it actually is. Without treatment your condition or problem could become worse. If you are planning to get medical treatment, a decision to refuse treatment or transport by EMS may result in a delay which could make you condition or problem worse.
3. Medical evaluation and/or treatment may be obtained by calling your physician, if you have one, or by going to any hospital emergency department in this area, all of which are staffed 24 hours a day by emergency physicians. You may be seen at these emergency departments without an appointment.
4. If you change your mind or your condition becomes worse and you decide to accept treatment and transport by EMS, please do not hesitate to call us back. We will do our best to help you.
5. ☐ If this box has been checked, it means your problem or condition has been discussed with an emergency physician at the medical control hospital by radio or telephone and the advice given to you by EMS has been issued or approved by the emergency physician.

I have been informed of the dangers of not being treated and/or transported by EMS based on my condition and need for treatment by an emergency department or private physician. I release ___________________________ and the consulting hospital, their employees and officers from all liability for any adverse results caused by my decision.

I have received a copy of this information sheet.

Signature ______________________________ *Print Name* ______________________________

Check one: ☐ Patient ☐ Spouse ☐ Parent ☐ Guardian

EMT Signature ______________________________ *Witness* ______________________________

Print Name ______________________________ *Report #* ________________ *Date* ________________

Non-Transports

General Considerations

A number of EMS calls result in non-transport of the patient or victim. If an individual is not transported by the squad, the following guidelines will apply:

1. In the event of a patient assist call or false call and no EMS services are rendered, a report should be made but Medical Control need not be contacted.

2. If the patient refuses treatment or transport, the patient refusal procedure should be followed.

3. Non-transport for minors with minor injuries or illness:
    a. If after evaluation of a minor, the EMT feels that the patient has an injury or illness that is so trivial that is does not require emergency medical treatment, that minor can be left in the care of a responsible adult who is not the parent or legal guardian. The responsible adult may be a family friend, neighbor, school bus driver, teacher, school official, police officer, social worker, or other person at the discretion of medical control and the EMT.

Non-Transport Advisory Sheet

You have been evaluated by an EMS provider in communication with a physician via telephone or radio. It has been determined that you do not need an ambulance at this time. THIS DOES NOT MEAN THAT YOU SHOLD NOT BE SEEN BY A PHYSICIAN. THE EVALUATION AND TREATMENT YOU RECEIVED WAS TO DETERMINE THE SEVERITY OF YOUR PROBLEM AND WHETHER OR NOT YOU NEEDED AN AMBULANCE; IT IS NOT A SUBSTITUTE FOR FINAL EVALUATION AND TREATMENT BY A PHYSICIAN.

We advise you to see a physician at this time. If you refuse, you assume the risk and acknowledge that this may cause problems in the future. The following steps may help you decide:

1. If you have a cut, only a physician should decide whether or not you need stitches. Most physicians recommend stitches within 8 hours because the risk of infection becomes much greater.
2. If you have a cut, scrape, or burn and have not had a tetanus shot within 5 years, you may need one. You do not need to get this shot immediately, but should have one within 24 hours.
3. Many burns do not appear to be as bad as they actually are. Also, serious problems can develop from some burns which may be prevented by early medical treatment.
4. If the problem or other discomfort you had has gone away, it does not necessarily mean the problem that caused it has gone away.
5. If you decide you do not need to see a physician and then change your mind, don't wait. He longer you wait the more problems you may have.

USE COMMON SENSE!

"If I don't have a physician or can not see my physician now, what can I do?"

Go to the nearest emergency department or call EMS again

Patient Signature ______________________ *Date* ______________________

EMT Signature ______________________ *Report Number* ______________________

On Scene Medical Provider

General Considerations

On an EMS run where an unknown EMT from outside the responding EMS agency wishes to intervene in patient care, the following steps should be initiated:

1. Ideally, if no further assistance is needed, the offer should be declined
2. If the intervener's assistance is needed or may contribute to patient care:
    a. An attempt should be made to obtain proper identification of a valid Ohio EMT card. Acceptance of borderline state's EMT cards is at the discretion of individual EMS services. Notation of intervener name, address, and certification numbers must be documented on the run report.
3. Significant involvement with patient care or variance from protocols requires the intervener to accompany the patient to the hospital.

If the on scene provider is a physician with no previous relationship to the patient and is not the patient's private physician, the following criteria must be met for this physician to assume any responsibility for care of the patient:

1. Medical Control must be informed and give approval
2. The physician must have proof that they are a physician. They should be able to show you their medical license. Notation of physician name, address, and certification numbers must be documented on the run report.
3. The physician must be willing to assume responsibility for the patient until relieved by another physician, usually at the emergency department.
4. The physician must not require the EMT to perform any procedures or institute any treatment that would vary from protocol and/or procedure.
5. If the physician is not willing or able to comply with all the above requirements, his/her assistance must be courteously declined.

Physician in His/Her Office or Urgent Care

1. EMS should perform its duties as usual under the supervision of Medical Control or by protocol
2. The physician may elect to treat the patient in the office
3. The EMT should not provide any treatment under the physician's direction that varies from protocol. If asked, the EMT should decline until contact is made with Medical Control
4. Once the patient has been transferred into the squad, the patient's care comes under Medical Control

Restraint Policy

General Considerations

Soft restraints are to be used only when necessary in situations where the patient is potentially violent and may be of danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of medical conditions such as:

1. Head trauma
2. Alcohol/drug related problems
3. Metabolic disorders (i.e., hypoglycemia, hypoxia, etc.)
4. Psychiatric/stress related disorders
5. Others

Patient health care management remains the responsibility of the EMS providers. The method of restraint shall not restrict the adequate monitoring of vital signs, ability to protect the patient's airway, compromise peripheral neurovascular status or otherwise prevent appropriate and necessary therapeutic measures. It is recognized that evaluation of many patient parameters requires patient cooperation and this may be difficult or impossible.

All restraints should have the ability to be quickly released, if necessary.

Restraints applied by law enforcement (i.e., handcuffs) require a law enforcement officer to remain in the patient care compartment with the patient to be available to adjust restraints as necessary. This policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control.

Restrained patients shall not be transported in a face down prone position to ensure adequate respiratory and circulatory monitoring and management. Nothing should be placed over the face or mouth except for an oxygen mask with oxygen provided or a surgical mask if the patient is spitting.

Restrained extremities should be monitored for color, nerve and motor function, pulse quality and capillary refill at the time of application and every 15 minutes thereafter. Vital signs, mental status, and pulse oximetry should be assessed and documented every 5-10 minutes.

Restraint documentation on the EMS report shall include:

1. Reason for restraint
2. Agency responsible for restraint application (i.e., police, EMS)
3. Documentation of cardio-respiratory status and peripheral neurovascular status

Termination of Resuscitation Efforts

General Considerations

"Resuscitation may be discontinued in the prehospital setting when the patient is non-resuscitable after an adequate trial of ACLS"

In accordance with the Journal of American Medical Association's guidelines for cardiopulmonary resuscitation and emergency cardiac care, the above statement encourages local medical directors to develop guidelines for prehospital care providers to terminate resuscitation efforts when the patient's survivability is questionable.

A trial of ACLS, according to guidelines, occurs when:

1. Adequate BLS has been provided for a reasonable length of time
2. Endotracheal intubation has been successfully accomplished
3. Intravenous access has been achieved and rhythm-appropriate medications and countershocks for ventricular fibrillation have been administered.
4. Persistent asystole or agonal electrocardiographic patterns are present and no reversible causes are identified.

The following criteria are for termination of resuscitative efforts at the scene following unmonitored, out of hospital, adult, primary cardiac arrest. The paramedic may terminate resuscitation when:

1. Adult cardiopulmonary arrest (not associated with trauma, body temperature, aberration, respiratory etiology, or drug overdose)
2. Standard ACLS in accordance with American Heart Association guidelines has been carried out for over 20 minutes
3. No restoration of circulation (spontaneous pulse rate of greater than 60 beats per minute for at least a 5 minute period)
4. Absence of persistent, recurring, or refractory ventricular fibrillation/tachycardia or any continuous neurological activity (e.g., spontaneous respirations, eye opening or motor response).

When all the above conditions have been met, the paramedic should contact medical control and request termination of resuscitative efforts.

General Considerations

Emergency Care for Hazardous Materials Exposure, 2nd Edition as well as DOT Guidebook and MSDS are available at all WeShare hospitals and on the Hazmat vehicle.

1. Scene Safety- rescuer safety is the number one priority. Once chemical contamination is suspected, rescuers will remain a safe distance to assess risk and plan rescue activities.
    a. **Delay rescue attempt until chemical risk is identified and adequately trained personnel with proper PPE are available.**
2. Objectives in patient care
    a. Terminate exposure
    b. Prevent further injury
    c. Prompt and effective patient treatment
    d. Early notification to receiving hospital with all chemical information available
        i. Description of the incident
        ii. Chemical name (spell and have it spelled back to you)
        iii. Manufacturer
        iv. Signs and symptoms
        v. Nature of injuries
        vi. Extent of field decontamination
3. Health and safety issues
    a. Prevent spread of contamination
    b. Prevent injury or exposure to responders

Decontamination

Occurs in warm zone by properly trained and equipped personnel

Patient Treatment

No medical intervention is to be performed until the exposed patient has been decontaminated and NO TRANSPORT of a contaminated patient will occur if the possibility of secondary contamination exists. EMS personnel should not enter the “HOT” or “WARM” zones, but wait to receive the decontaminated patient(s) and initiate prehospital care.

Contact with Medical Control must be established prior to advanced prehospital care, i.e., IV’s or administration of medications

Actual treatment modalities- see Hazmat Protocols in the adult section of the protocol

Significant Exposure Guidelines

The Ohio Revised Code section 3401.248 defines a significant exposure as:

> *(a) A percutaneous or mucous membrane exposure of an individual to the blood, semen, vaginal secretions, or spinal, synovial, pleural, peritoneal, pericardial or amniotic fluid of another person;*
> *(b) Exposure to a contagious or infectious disease.*

According to the Bureau of Workers Compensation, significant exposures have not been given a medical diagnostic classification. Therefore, the following guidelines should be followed by all WeShare paramedics at all three participating facilities:

- If a significant exposure occurs, the paramedic is required to register into the receiving facility Emergency Department as a patient.
- The paramedic is required to register as a work related injury.
- The paramedic should be evaluated by an Emergency Department physician and treatment instituted as deemed necessary.
- The paramedic will be responsible for all follow-up care according to the protocol at the hospital where initial treatment was rendered.

Persistent Nausea and Vomiting

General Considerations

Nausea and vomiting are not diseases, but rather are symptoms of many different conditions, such as infection ("stomach flu"), food poisoning, motion sickness, overeating, blocked intestine, illness, concussion or brain injury, appendicitis, and migraines. Nausea and vomiting can sometimes be symptoms of more serious diseases such as heart attacks, kidney or liver disorders, central nervous system disorders, brain tumors and some forms of cancer.

Persistent vomiting combined with diarrhea can result in dehydration. More aggressive treatment may be necessary for younger children or anyone with severe dehydration.

Procedure

1. Assess ABC's, obtain history and provide oxygen as necessary. Consider cause and treat, if possible.
2. Obtain vitals, start IV NS TKO, and apply cardiac monitor
3. If nausea and vomiting persist, administer Zofran 4 mg slow IVP over 2 minutes. May also be given IM if unable to start IV.
4. Reevaluate patient and transport.

Single dose only. Do NOT repeat Zofran.

Zofran (Ondansetron)

Therapeutic Effects: The primary pharmacological effect of Zofran (Ondansetron) is the selective blocking of the serotonin 5-HT3 receptors located in the vagus nerve system and chemoreceptor trigger zone in the brain.

Indications: To relieve nausea and vomiting. When administering medications that have known nausea effects, Zofran can be given as adjunctive therapy to prevent nausea and vomiting. When transporting patients via air ambulance, Zofran can be used to prevent nausea and vomiting in these high risk situations.

Contraindications: Known allergy to Zofran or similar medications such as Anzement (Dolasetron), Kytril (Granisteron), Aloxi (Pabnosetron), or other serotonin selective 5-HT3 blocking agents.

Side Effects: Rare but can include hypotension, rash, chest pain, gastrointestinal upset and itching.

How Supplied: 4 mg ampules, 2 mg or 4 mg tablets, 2 mg or 4 mg oral dissolving tablets

Administration: 2-4 mg slow IV push (30 seconds to 2 minutes). May be given 2-4 mg IM, 2-4 mg oral dissolving tablet, or 2-4 mg oral tablet.

Adult Dosage: For patients 40 kg (90 lbs.) or greater, administer 4 mg IV, IM, or oral dissolving tablet or regular tablet.

Pediatric Dosage: Contact Med Control for pediatric administration.

Continuous Positive Airway Pressure (CPAP)

Continuous Positive Airway Pressure (CPAP) has been shown to rapidly improve vital signs, gas exchange, reduce the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in patients who suffer from shortness of breath due to CHF, asthma, COPD, pulmonary edema, or pneumonia. In patients with CHF, CPAP improves hemodynamics by reducing preload and afterload.

Indications

CPAP is indicated for patients in moderate to severe respiratory distress and any of the following:

- COPD exacerbation with failure to improve despite oxygen and beta-agonist (Albuterol) administration.
- Pulmonary edema/CHF with failure to improve despite oxygen, nitrates, and diuretics.
- May be considered in asthmatics, pneumonia, near-drowning, and other causes of respiratory distress when the patient fails to improve despite maximum conventional therapy.
- May also be considered in "Do Not Intubate" patients who fail to improve despite maximum conventional therapy
- Patient must be able to maintain an open airway (GCS >10).
- Patient is 12 years of age or older and able to fit CPAP mask.
- Must have 2 or more of the following inclusion criteria:
  - Respiratory rate >25 breaths per minute
  - Retractions, accessory muscle usage, or fatigue
  - Pulse oximeter reading of less than 92%

Contraindications

- Hemodynamic instability or shock (BP <90)
- Profound hypoxemia
- Respiratory arrest/ apnea/ agonal respirations
- Persistent nausea and vomiting
- Agitation
- Cardiac arrhythmias
- Suspected ischemia or acute myocardial infarction
- Recent gastric, laryngeal, or esophageal surgery
- Pneumothorax (observed or suspected)
- Facial fractures
- Significant chest trauma
- Tracheostomy

Complications

- Facial skin necrosis
- Aspiration
- Pneumonia
- Barotrauma and pneumothorax
- Hypotension
- Respiratory arrest

Continuous Positive Airway Pressure (CPAP)

Procedure

1. Explain the procedure to the patient so they understand the therapy.
2. Ensure the patient is on the cardiac monitor and continually monitor the pulse oximeter.
3. Ensure an adequate number of personnel are available to monitor the patient closely.
4. Always be ready to discontinue the procedure and perform bag-valve-mask ventilation and/or endotracheal intubation.
5. Apply the mask and secure the straps so that the mask is just snug and secure enough to prevent air leaks and remain stable.
6. Begin the procedure with 100% oxygen in the system and 5 cm H_2O of pressure
7. Pressure may be increased slowly by 2 cm H_2O every 3-5 minutes as tolerated by the patient (max of 10 cm H_2O).
8. Inform the receiving hospital that you have a CPAP patient and maintain treatment into the receiving hospital's ED until care is transferred to the attending physician.
9. The goal of therapy is to:
    a. Improve the patient's comfort while breathing.
    b. Improve oxygen saturation to ≥90%.
    c. Decrease the work of breathing and achieve a respiratory rate ≤24.

STOP CPAP IMMEDIATELY IF ANY OF THE FOLLOWING OCCUR:

1. Respiratory arrest or worsening respiratory distress (rate ≥35).
2. Increased agitation, lethargy, or confusion.
3. Oxygen saturation remains ≤85% despite therapy.
4. The patient begins to develop cardiac arrhythmias, bradycardia, or significant tachycardias.
5. Hemodynamic instability/ shock.
6. The patient begins to vomit or have increased secretions and is unable to protect their airway.

Documentation Note:

Our failed attempt to relieve the patient's respiratory distress with conventional therapy, whether it is Lasix, Albuterol, Nitroglycerin, or oxygen must first be charted. Next, the indication for CPAP must be stated. Finally, the patient's B/P, heart rate, cardiac rhythm, pulse oximeter reading, delivered oxygen amount, mental status, and response to therapy with CPAP must be documented when CPAP is first begun and every 2 minutes thereafter.

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