

# HEAT INJURIES

## HEAT EXHAUSTION

**RATIONALE:** Exposure to heat extremes, especially accompanied by high humidity is common in Kansas during the summer months and may be manifested as heat cramps, heat exhaustion or heat stroke. The longer the body remains hyperthermic, the greater the damage and consequent increase in morbidity and mortality. Heat exhaustion is a "derangement of body function encountered when the body temperature is elevated, usually in the 102.2 - 105.8 range."

**POPULATION:** The typical victim is usually unacclimatized and has worked in the heat for several days. The very young and elderly are at great risk for heat related illness. Also, the obese person has a greater risk of suffering from a heat related illness, since heat loss is inversely proportional to body size and weight. Also, adipose tissue serves as an insulator.

### INTERVENTION INDICATORS:

minor irritabilities	euphoria
cool, clammy skin	nausea/vomiting/diarrhea
headache	flu like symptoms
muscle cramps	thirst
intact mental status, although minor aberrations may be manifested	

### INTERVENTIONS:

1. Secure airway, assess breathing and circulation and intervene as necessary.
2. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM
3. Move patient to cool environment as soon as possible and rapidly decrease body temperature.
4. Remove clothing, place ice packs over neck, axillae, and inguinal areas.
5. Covering the patient with cool fluid. This will increase the air over the patient and enhance heat loss by increasing the evaporation gradient.
6. Establish large bore IV of NS and infuse 1000cc over 1 - 2 hours.  
Titrate infusion as determined by patient's state of perfusion.
7. Contact appropriate medical control for further orders as indicated.

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## Heat Stroke

**RATIONALE:** Exposure to heat extremes, especially accompanied by high humidity is common in Kansas during the summer months and may be manifested as heat cramps, heat exhaustion or heat stroke.(1) The longer the body remains hyperthermic, the greater the damage and consequent increase in morbidity and mortality. (2) Heat stroke is a life threatening medical emergency. The body's physiologic heat dissipating mechanisms fail; body temperature rises rapidly and uncontrollably. (3) At 42 degrees Celsius and greater, the oxygen demands surpass the oxygen supply.

**POPULATION:** Heat stroke classically occurs in the elderly, ill, and infants over a period of days, usually during heat waves. It also commonly occurs in the fit, unacclimatized persons, i.e. military training boot camps.

### **INTERVENTION INDICATORS:**

Dizziness	malaise
Coma	tachycardia
muscle cramps	thirst
headache	decreased CNS perfusion
fever	hypotension
hot flushed skin with or without sweating	
hyperventilation with rates up to 60 per minute	pulmonary edema

### **INTERVENTIONS:**

1. Secure airway, assess breathing and circulation and intervene as necessary.
2. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM
3. Move patient to cool environment as soon as possible and rapidly decrease body temperature.
4. Remove clothing, place ice packs over neck, axillae, and inguinal areas.
5. Covering the patient with cool fluid. This will increase the air over the patient and enhance heat loss by increasing the evaporation gradient.
6. Establish IV 0.9% NS with macro drip tubing at TKO unless hypotensive.
7. Contact appropriate medical control for further orders as indicated.

# HYPOTHERMIA

**RATIONALE:** Hypothermia results from prolonged exposure to low temperatures, especially when conditions are wet and windy. Hypothermia is defined as a core body temperature of less than 35 degrees Celsius. Depending on weather conditions, this syndrome may occur year round.

**PATIENT POPULATION:** The elderly and those in poor health are especially susceptible to hypothermia. Alcoholics and children are also among the highest risk.

## **INTERVENTION INDICATORS:**

**MILD (33-36 C or 91.4-96.8 F)**

decreased CNS perfusion	increased metabolic rate
shivering	bradycardia
ataxia	poor coordination

**SEVERE (17-32 C or 62.6-89.6 F)**

decreased CNS perfusion	arrhythmias
decreased metabolic rate	metabolic acidosis
coma	v-fib
apnea	cardiac arrest

## **INTERVENTIONS:**

1. Secure airway, assess breathing and circulation and intervene as necessary.
2. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM
3. Remove from environment and initiate appropriate rewarming techniques:
  - A. Passive external rewarming includes placing patient in a warm environment, covering patient with blankets, and allowing patient to rewarm naturally.
  - B. Active external rewarming includes placing heat on the external surface of the patient (Le. thermal blankets and heat packs to groin, neck, and axilla).
  - C. Active internal rewarming includes heated oxygen, IV fluids, etc.
4. Treat any dysrhythmia per current ACLS standards.
5. Contact appropriate medical control for further orders, such as:
  - A. Dextrose
  - B. Narcan
  - C. Sodium Bicarbonate
  - D. Antiarrhythmics.

## CHEST PAIN R/O MI

**RATIONALE:** Chest pain and its equivalents (arm, neck, or jaw pressure, burning or numbness) are the predominant symptoms in chronic stable angina, unstable angina, variant angina, and acute myocardial infarction.

**POPULATION:** The magnitude of cardiovascular disease as a national problem is evidenced by the fact that coronary heart disease continues to be one of the most predominant health problems in the United States. Over 1.5 million people each year experience the most serious manifestation of coronary artery occlusive disease - acute myocardial infarction. (1)

### INTERVENTION INDICATORS:

Chest discomfort	Altered perfusion
Potential for SOB and tachypnea	Altered end organ perfusion
Nausea/vomiting	Altered CNS perfusion
Diaphoresis	Interpretation of abnormal 12 lead EKG

### INTERVENTIONS:

1. Secure airway, assess breathing and circulation and intervene as necessary.
  - A. Endotracheal intubation as indicated
  - B. Combi-tube as indicated
2. Oxygen 1- 6 LPM n/c, 10-15 LPM/NRFM or 15LPM/BVM.
3. Monitor EKG and document.
4. Establish large bore IV of .9% NACL at TKO.
5. Administer ASA:
  - A. Dose of 324 mg's
6. Administer Nitroglycerin (if SBP > 90) as indicated:
  - A. Nitroglycerin spray 0.4 mg (1/150gr) 1 puff every 5 minutes (unless pain resolved), total dose 3 puffs.
7. If chest pain remains unrelieved, administer Morphine Sulfate 1 -3 mg IV over 1 - 5 minutes.  
Titrates to effect.
8. Consider Fentanyl, titrate 50 – 200 mcg's IV over one to two minutes
9. Consider Nitroglycerin IV infusion, if pain remains unrelieved.
  - A. Add 25 or 50 mg to 250cc NS or D5W and initially start infusion at 5 - 10 mcg/min, increasing by 5 - 10 mcg/min every 5 -10 minutes until desired hemodynamic or clinical response is achieved.
10. Contact appropriate medical control for further orders as indicated, such as:
  - A. Thrombolytic agents (i.e. Heparin and/or TPA).
  - B. Magnesium Sulfate.

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## ABDOMINAL PAIN

RATIONALE: Abdominal pain may be the result of a chronic disease, or may be the result of an acute abdominal emergency requiring immediate management. A wide variety of conditions may present with abdominal pain as the primary complaint.

PATIENT POPULATION: Typically adult patients, but may include all age groups, and may not be the primary event.

### INTERVENTION INDICATORS:

Decreased CNS perfusion altered perfusion	Severe abdominal pain
Decreased end organ perfusion pale skin	Open abdominal wound
Potential for SOB and tachypnea	Obvious soft tissue injury to abdomen
Distended or rigid abdomen with decreased or absent bowel sounds	

### MANAGEMENT:

1. Secure airway, assess breathing and circulation and intervene as necessary.
2. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM, or 100% BVM .
3. Establish 1 or 2 large bore IV's of .9 % NACL if possible, and titrate infusion determined by patient's state of perfusion.
4. Palpate for pulsatile mass.
5. Contact appropriate medical facility and transport

# RESPIRATORY FAILURE

**RATIONALE:** Respiratory distress may be the result of a disease process or a complication of injury, from asthma and pneumonia to emphysema and pulmonary embolism. Dyspnea is second only to chest pain in frequency in the emergent setting. Assessing and correcting respiratory distress is the cornerstone of quality medical monitoring and intervention. Respiratory Failure will be divided into Adult Respiratory Distress Syndrome, Chronic Obstructive Pulmonary Disease, and Pulmonary Embolism. The goal is to maintain adequate ventilation and oxygenation.

**Adult Respiratory Distress Syndrome (ARDS):** Occurs when the patient is unable to maintain adequate ventilation. ARDS is defined as a  $pO_2 < 60$  mmHg and a  $pCO_2 > 50$  mmHg. The initial concern is for adequate ventilation for the patient, followed by management of the underlying process that led to ARDS.

**PATIENT POPULATION:** Includes all patient ages and types, medical and trauma, as the primary problem or a complicating secondary problem.

## INTERVENTION INDICATORS:

- Decreased mentation
- Cyanosis
- Tachypnea
- Dyspnea

## INTERVENTION:

1. Secure airway, breathing and circulation.
  - A. Combi tube as indicated
  - B. Endotracheal intubation as indicated.
2. Oxygen 1 -6 LPM N/C, 10-15 LPM/ NRFM or 15 LPM/ BVM assisting ventilations.
3. Obtain vital signs, LOC, physical assessment and history.
4. Monitor ECG; document rhythm.
5. Establish large bore IV with 0.9% NACL at TKO.

NOTE: Combativeness may be present due to hypoxia, but sedation to relieve anxiety should only be used after oxygenation and/or intubation to secure the airway.  
Consider RSI
6. Contact appropriate medical control for further orders as indicated and consider:
  - A. Solu-Medrol 125- 250 mg IV.
  - B. Ventolin treatment of .5mg in 2cc normal saline.  
May repeat every 10 - 15 minute
  - C. C-PAP

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## Chronic Obstructive Pulmonary Disease (COPD)

**RATIONALE:** Patients with COPD may be prone to episodes of acute decompensation leading to respiratory failure. These episodes are often triggered by a respiratory infection, but may also be caused by non-compliance with medication or continuation of smoking. Management of the COPD patient in acute decompensation is aimed at relieving hypoxemia. However, this is complicated because many of these patients breathe on a hypoxic drive, thus administering oxygen may reduce their stimulus to breathe, resulting in apnea. This is NOT a justification to deprive the COPD patient of oxygen, but as a precautionary reminder that the COPD patients' respiratory status will need to be monitored closely and possibly assume ventilating the patient.

**PATIENT POPULATION:** Significantly afflict more than 25% of all adults, and cause morbidity or mortality in more than 15 % of the population.

### INTERVENTION INDICATORS:

Anxiety	Use of accessory muscles to breathe
pursed lip breathing	Gross lung overinflation
Chronically hunched forward	"Air hunger"
supporting torso with elbows on knees	Dyspnea on exertion
Increased AP diameter of the thorax	Cough
Loose wheezes, rhonchi and rales	Cyanosis
Thick bronchopulmonary secretions	

### INTERVENTION:

1. Secure airway, breathing and circulation.
  - A. Combi tube as indicated
  - B. Endotracheal intubation as indicated.
2. Oxygen 1 -6 LPM N/C, 10-15 LPM/ NRFM or 15 LPM/ BVM assisting ventilations.
3. Obtain vital signs, LOC, physical assessment and history.
4. Monitor ECG; document rhythm.
5. Establish large bore IV with 0.9% NACL at TKO  
NOTE: These patients will not normally tolerate laying down, and will insist upon sitting up "to breathe." Keep the patient in a position of comfort to decrease anxiety.
6. Give an aerosol Ventolin treatment of .5mg in 2cc normal saline.  
May repeat every 10 - 15 minute
7. Contact appropriate medical control for further orders as indicated, such as:
  - A. C-PAP
  - B. Solu-Medrol 125-250 mg's IV

## Pulmonary Embolism

**RATIONALE:** Although the exact incidence is unknown, it is estimated that 700,000 persons in the United States suffer a pulmonary embolism each year. Approximately 20% to 30% of victims who do not receive definitive therapy succumb to the hemodynamic sequelae; 44 % of these patients die within 15 minutes and another 22% within 2 hours of the onset of symptoms. If the diagnosis of pulmonary embolism is suspected and appropriate therapy instituted, the mortality can be reduced to approximately 8%. Statistically, pulmonary embolism is the third most common direct or proximate cause of death in the United States.

**PATIENT POPULATION:** Not limited to the following risk factors: Heart disease, Deep venous thrombosis, Immobilization (prolonged travel, prolonged bed rest, orthopedic cast), Chronic diseases (congestive heart failure, chronic lung disease, peripheral vascular disease), Malignancy, Obesity, Peripartum states, Oral contraceptives, Previous embolism, Estrogen therapy, Disorders in clotting and fibrinolysis, Multiple trauma.

### INTERVENTION INDICATORS:

May complain of nonspecific and variable symptoms.

Lower chest pain	Anxiety	Pleural friction rub
Dyspnea	Syncope	Tachypnea
Cough	Diaphoresis	Tachycardia
Hemoptysis	Fever (> 102F)	Abdominal pain
Murmurs	S3, S4	Hypotension and shock

### INTERVENTION:

1. Secure airway, breathing and circulation.
  - A. Combi tube as indicated
  - B. Endotracheal intubation as indicated.
2. Oxygen 1 -6 LPM N/C, 10-15 LPM/ NRFM or 15 LPM/ BVM assisting ventilations. Maintain PaO<sub>2</sub> > 90 mmHg, or SpO<sub>2</sub> > 90% with supplemental oxygen, mechanical ventilation, And C-PAP if necessary.
  - Consider RSI
    - A. Anectine 1.5 mg/kg IV.
    - B. Norcuron 0.1 mg/kg IV (reduce to 0.05 mg/kg if used in conjunction with Anectine)
    - C. Versed, titrating in 1 - 2 mg IV increments till desired effect is achieved.
    - D. Diazepam, 2 - 5 mg IV
3. Obtain vital signs, LOC, physical assessment and history.
4. Monitor ECG; document rhythm.
5. Establish large bore with 0.9% NACL at TKO or to maintain a systolic pressure > 80 mmHg, in the hypotensive patient, or 80 to 100 cc/hr in the normo-hypertensive patient.
6. Contact appropriate medical control for further orders as indicated, such as:
  - A. Dopamine infusion to maintain blood pressure as noted above.
  - B. 5,000 to 10,000 U Heparin bolus and 1,000 U/hr Heparin drip.  
(Note: Draw blood for baseline coagulation studies before giving Heparin)



## Acute Asthma

**RATIONALE:** Asthma is defined as "a disease characterized by an increased responsiveness of the trachea and bronchi to various stimuli and manifested by widespread narrowing of the airways that changes in severity either spontaneously or as a result of therapy." (American Thoracic Society) These exacerbations, interspersed with symptom-free periods, range from mild airway obstruction to profound respiratory failure. Clearly the assessment of the severity of this airway obstruction and its response to optimized acute treatment is of paramount importance.

**PATIENT POPULATION:** Asthma is estimated to affect approximately 5% of adults and 7% to 10% of children in the United States with an annual mortality of about 1 in 100,000 persons. It is a disease affecting primarily younger people: one half of all cases develop before age 10 years and another one third occur before age 40 years. Before puberty, male-to-female preponderance is 2 : 1, which subsequently equalizes during adolescence and thereafter.

### INTERVENTION INDICATORS:

Cough	Dyspnea	Wheezing
Prolonged Expiratory Phase	Inspiratory retractions	Use of Accessory Muscles
Cyanosis Lethargy	Progressive exhaustion	Absent breath sounds
SpO <sub>2</sub> > 90% with High flow O <sub>2</sub> .	Tachypnea	Decreased consciousness
Difficulty talking	Pulsus paradoxus	pCO <sub>2</sub> > 55 mmHg

### INTERVENTION:

1. Secure airway, breathing and circulation.
  - A. Combi tube as indicated
  - B. Endotracheal intubation as indicated.
2. Oxygen 1 -6 LPM N/C, 10-15 LPM/ NRFM or 15 LPM/ BVM assisting ventilations.
3. Obtain vital signs, LOC, physical assessment and history.
4. Monitor ECG; document rhythm.
5. Establish large bore IV with 0.9% NACL at TKO , unless patient appears dehydrated, then at 125 cc/hr.
4. Consider:
  - A. Aerosol Ventoline treatment, 0.5mg in 2cc Normal Saline, if diffuse wheezing or bronchospasm is noted.
  - B. 0.3 - 0.5 mg Epinephrine, 1:1,000 Subcutaneous in the moderately distressed asthmatic or 0.3 - 0.5 mg Epinephrine, 1: 10,000 IV in the severely, acute asthmatic.
  - C. Solu-Medrol 125 - 250 mg IV, (give early in intervention) dependant more upon severity of reaction than size.
5. Contact appropriate medical control for further orders as indicated and transport.

# EMERGENCY DELIVERY

**RATIONALE:** Complications that arise during pregnancy that place the obstetric patient and fetus at risk have many causes.

**POPULATION:** Preterm delivery occurs in 6-9% of all deliveries. Although statistics are not available, full term deliveries also occur in the field.

## INTERVENTION INDICATORS:

heavy, bloody show	fetal bradycardia
frequent, regular contractions	desire to "bear down" by mother
bulging membranes from the vulva	crowning of the fetal head

## INTERVENTIONS:

1. Secure airway, assess breathing and circulation and intervene as necessary.
  1. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM, or 100% BVM.
2. Establish large bore IV of LR and infuse at < 50cc/hour.
3. Prepare mother by placing her in a prone position with knees apart or in a side lying position.
4. Assess fetal heart tones.
5. Monitor contractions.
6. Maintain sterile technique, if possible.
7. Have mother pant with each contraction or push gently.
8. Place fluid absorbent pad under mother.
9. Place gentle pressure on the fetal head when it crowns, while supporting the perineum with a towel.
10. Support head with both hands, but allow it to rotate naturally.
11. Check for cord around the infant's neck.
  - A. If it is there, attempt to slip it over the infant's head.
  - B. If it is too tight, immediately clamp the cord in two places and cut the cord between the clamps.
12. Suction the infant's mouth, then nose.
13. Deliver the shoulders by guiding the head downward to deliver the anterior shoulder, and then upward to deliver the posterior shoulder.
14. Note the time of birth.
15. If the membranes are still intact, snip them at the nape of the neck and peel them away from the face.
16. Suction the infant's mouth and nose once again.
17. Clamp the cord and cut between the clamps with sterile scissors.
18. Follow newborn protocol.
19. Instruct mother to bear down. (Delivery of the placenta should occur spontaneously within 20 minutes of birth of baby).
20. Apply gentle traction on the cord. DO NOT pull cord. 21. Massage fundus immediately after delivery of placenta.
22. Inspect placenta for missing sections. Save in plastic bag.
23. Gently clean perineal area and apply sanitary pad.
24. Increase IV fluids to 150cc/hour. Titrate to patient's state of perfusion. 25. Keep mother warm.
26. Contact appropriate medical control for further orders as indicated,
  - such as:
    - A. Pitocin

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## **PRETERM LABOR**

**RATIONALE:** Regular and rhythmic contractions that produce progressive cervical changes after the twentieth week of gestation and prior to the thirty-seventh week is considered to be preterm. The complications associated with preterm labor and delivery predominantly affect the fetus. Birth trauma, and the complications associated with transition to extrauterine life for the premature, are primary. Maternal complications include adverse reactions to labor-suppressing agents, endometritis, septicemia, septic shock, or other complications associated with preexisting conditions.

**PATIENT POPULATION:** Preterm delivery occurs in 6-9% of all deliveries.

### **INTERVENTION INDICATORS:**

pregnancy induced hypertension	fullness in vagina
regular contractions	cervical incompetence
vaginal mucus	lower abdominal discomfort
history of flu-like symptoms	spontaneous rupture of membranes

### **INTERVENTIONS:**

1. Complete primary survey, intervene as indicated, and prepare patient for transport.
2. Determine contraction pattern.
3. Determine status of amniotic membranes.
4. Determine cervical status.
5. Maintain left lateral position.
6. Monitor fetus.
7. Establish large bore IV of .9 % NACL at TKO.
10. Contact appropriate medical control for further orders as indicated.

# **OBSTETRIC HEMORRHAGE COMPLICATIONS**

**RATIONALE:** A placental abruption can be defined as a premature detachment of a normally implanted placenta from the uterine wall. Placenta previa occurs when the placenta implants in the lower uterine segment and covers or partially covers the internal cervical os. Potential complications include DIC, postpartum hemorrhage, hypovolemic shock, anemia, renal failure, and fetal distress or death.

**PATIENT POPULATION:** The obstetric patients at risk are those with abdominal trauma, multiparity, age over thirty-five years, amniocentesis, substance abuse, and uterine anomalies or tumors.

## **INTERVENTION INDICATORS:**

### **Placental Abruption**

severe abdominal pain rigid abdomen  
vaginal bleeding contractions  
signs of altered perfusion fetal distress  
oliguria  
pallor  
tachypnea  
petechia  
hematuria

### **Placenta Previa**

painless vaginal bleeding contractions  
signs of altered perfusion fetal distress  
oliguria  
pallor  
tachypnea  
petechia  
hematuria

## **INTERVENTIONS:**

1. Secure airway, assess breathing and circulation and intervene as necessary
2. Oxygen 1 -6 LPM N/C, 10-15 LPM/ NRFM or 15 LPM
3. Obtain vital signs, LOC, physical assessment and history.
4. Monitor ECG and document rhythm.
5. Establish two large bore IV's of LR, if possible, and titrate infusion determined by patient's state of perfusion.
6. Monitor fetus.
7. Observe for signs of DIC.
8. Contact appropriate medical control for further orders as indicated.

# **PREGNANCY INDUCED HYPERTENSION**

**RATIONALE:** Pregnancy induced hypertension refers to a group of hypertensive disorders that have their onset during pregnancy and resolve following pregnancy. As the disease progresses, blood perfusion to all body organs is decreased. The function of the placenta, kidneys, liver, and brain is significantly impaired.

**PATIENT POPULATION:** Primarily, pregnancy induced hypertension is a disease of the primigravida, the teenage primigravida or primigravida over thirty-five years of age. The patient with diabetes mellitus, preexisting cardiovascular or renal disease, hydramnios, family history of pregnancy induced hypertension, or no prenatal care is also at risk.

## **INTERVENTION INDICATORS:**

Hypertension	seizures
Edema	pulmonary edema
Hyperreflexia	visual disturbances
epigastric pain	cerebral hemorrhage

## **INTERVENTIONS:**

1. Complete primary survey, intervene as indicated.
2. Establish large bore IV of .9 % NACL at TKO.
3. Decrease sensory stimulation.
5. Monitor fetus.
6. Give Magnesium Sulfate as indicated for seizure activity.
  - A. Add 20 Grams of Magnesium Sulfate to 500cc LR and give bolus of 4-6 Grams slowly over 15 minutes, followed by infusion of 1-3 Grams/hour.
  - B. Monitor deep tendon reflexes and respiratory rate.
  - C. Have Calcium Gluconate available as antidote.
7. Give Valium per seizure protocol as indicated.
8. Evaluate for signs of pulmonary edema and follow protocol as indicated.
9. Contact appropriate medical control for further orders.

# **TOXICOLOGIC / POISONING EMERGENCIES**

**RATIONALE:** Emergency situations involving toxic substances occur intentionally, accidentally, socially, recreationally and with acute and chronic encounters. The most important concept in the care of the patient who has been poisoned is supportive care. In addition to maintaining the patient's airway, breathing, and circulation, the reason why the patient has been poisoned needs to be quickly discovered in order to prevent the possibility of further harm to the patient and those providing care to the patient.

**PATIENT POPULATION:** In 1988, the American Association of Poison Control Centers reported that 88.2% of human poison exposure cases were accidental and 10% were intentional. Poisoning generally occurs in the pediatric population. Patients who have overdosed or intentionally poisoned themselves are usually twelve years and older.

## **INTERVENTION INDICATORS:**

decreased CNS	altered perfusion
altered respiratory patterns	cardiac dysrhythmia
coma	seizures
GI disturbances	metabolic acidosis

## **INTERVENTIONS:**

1. Remove patient from toxic environment or toxic source.
2. Secure airway, assess breathing and circulation and intervene as necessary.
3. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM, or 100% BVM .
4. Monitor EKG and document
5. Establish large bore IV of .9% NACL at TKO.
  - A. Draw blood for baseline data.
  - B. Determine blood glucose level.
6. Administer D50 one ampule IV as indicated.
7. Administer Narcan 0.4mg up to 2mg IV or per endotracheal tube as indicated for unconscious patient.
8. Follow seizure protocol as indicated.
9. Treat dysrhythmia as indicated per protocol.
10. If poisoning agent was not caustic, place nasogastric tube.
11. Contact appropriate medical control for further orders as indicated, such as:
  - A. Specific antidotes.
  - B. Vasopressors for hypotension.
  - C. Afterload reducers or negative inotropic agents for hypertension.

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## SEIZURES

Seizures may result from a central nervous system disorder or may present as a symptom of an underlying metabolic or systemic disease. Appropriate intervention for the control of the seizure is primarily supportive, management of the airway and cardiovascular system, and treatment of an associated condition. The incidence of seizure onset is approximately one-half the population of the United States, with highest incidence among children under five and males over twenty. The prevalence rate is relatively constant between the ages of ten and sixty.

### INTERVENTION INDICATORS:

involuntary motor activity	tachycardia
continuous tense muscular stage	hyperventilation
hypertension	incontinence
decreased CNS perfusion	apnea

### INTERVENTION

1. Secure airway, assess breathing and circulation and intervene as necessary.
2. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM, or 100% BVM .
3. Prevent patient from further injury
4. If postictal, allow patient to rest.
5. Establish IV of .9% NACL at TKO
6. Determine blood glucose level and intervene as indicated
7. Administer valium 5 – 10 mg over 1 – 2 min. if:
  - a. The seizure last longer than 5 min.
  - b. The patient has repeated seizures without returning to a normal level of consciousness  
May repeat valium every 2 – 5 min. as necessary
8. For pediatrics, administer Valium 0.1mg to 0.3mg IV slowly.
  - a. Same dose may be given rectally if no IV access is available.
  - b. May repeat Valium in 15 minute intervals.
9. Contact appropriate medical control for further orders as indicated.
10. Transport to the appropriate facility.

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## Adult Cardiac Arrest

Sudden Cardiac Arrest is a leading cause of death among adults over the age of 40. In the United States alone, cardiac arrest accounts for an estimated 325,000 people per year or around 1,000 people. This accounts for one person every two minutes dying from Sudden Cardiac Arrest. There are many possible causes of cardiac arrest. They include coronary heart disease, heart attack, electrocution, drowning, or choking. Approximately 10 percent of Sudden Cardiac Arrest events occur among people less than 40 years of age. More people die each year from Sudden Cardiac Arrest than the number who die from colorectal cancer, breast cancer, prostate cancer, auto accidents, Aids, firearms, and house fires combined. Without medical attention, the person will die within a few minutes. CPR immediately can double or triple survival rates. Brain death and death usually start to occur in 4 – 6 minutes. The patient is less likely to die if they have early cardiopulmonary resuscitation (CPR) and defibrillation. If defibrillation occurs within 1 minute there is a 90% chance of survival. Survival rates drop by 7 - 10% for each minute of delay. For EMS workers the primary intervention is to determine the cause and treat the cause along with proficient CPR and defibrillation if indicated.

### INDICATORS:

- Sudden collapse
- No pulse
- No breathing
- Loss of consciousness

### UNDERLYING CAUSES:

Hypovolemia	Tablets or Toxins
Hypoxia	Cardiac tamponade
Hydrogen Ions	Tension pneumothorax
Hyperkalemia or HypoKalemia	Thrombosis
Hyperthermia	Thromboembolism
Hypoglycemia or Hyperglycemia	

1. Assess airway, breathing and circulation and intervene as necessary.  
Initiate CPR
1. Oxygenate with 100% by BVM
2. Apply EKG and Document
3. Defibrillate at 300 Jules if indicated. Refer to AHA guidelines.
4. Establish airway
  - A. Endotracheal intubation as indicated
  - B. Combi-tube as indicated
5. Establish IV of .9% NACL at TKO unless otherwise indicated
6. Consider;
  - Epinephrine 1mg of 10; 10,000 IV or double the dose if given ETT
  - Atropine 1 mg IV or double the dose if given ETT
  - Consider Lidocaine 100 mg IV or double the dose if given ETT.
  - Initiate Lidocaine drip if appropriate
7. Contact appropriate medical facility and transport

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# Burns

**RATIONAL:** It is estimated there are approximately 2.4 million burns injuries each year in the United States. About 650,000 are treated by medical professionals and 75,000 of those are hospitalized. Between 8,000 and 12,000 patient with burns die, and approximately one million will sustain substantial or permanent disabilities resulting from their burn injury. In 2005, the Center for Disease Control and Prevention reported that deaths from fires and burns are the fifth most common cause of unintentional deaths in the United States and the third leading cause of residential deaths. The majority of fire-related deaths (70 percent) are caused by smoke inhalation of the toxic gases produced by fires. Actual flames and burns only account for about 30 percent of fire-related deaths and injuries. 75% of burn fatalities occur at the scene. Burn accident statistics show that at least 50% of all burn accidents can be prevented. Burn injuries are second to motor vehicle accidents as the leading cause of accidental death in the United States.

**DEMOGRAPHICS:** 70% of burn victims are male, and 30% female. Ethnicity includes 62% Caucasian, 18% African-American, 12% Hispanic, 8% other. Burn causes include 46% fire/flame, 32% scald, 8% hot object contact, 4% electrical, 3% chemical, 6% other and the place of occurrences are 43% home, 17% street/highway, 8% occupational, 32% other.

## **INTERVENTION INDICATORS:**

1. Secure airway, assess breathing and circulation and intervene as indicated.  
The American Burn Associations suggest using the following mnemonic:  
**A** Airway  
**B** Breathing  
**C** Circulation  
    C- Spinal immobilization  
    C- Cardiac status  
**D** Disability  
    D- Neurological deficits  
**E** Exposure and evaluate  
**F** Fluid resuscitation  
Endotracheal intubation as indicated  
    Consider RSI per protocol  
Combi-tube as indicated  
    (Interal burns from inhalation can result in laryngeal edema that can occlude and airway. Intubate if evidence suggest respiratory tract burns).
2. STOP the burning, remove the patient from the source, and remove clothing and any jewelry in the affected area. Cool the area with saline soaks or sterile water if less than 15% burns. Avoid long cooling of large body surface areas.
3. Oxygen at 1-6 LPM or 10 – 15 LPM NRFM based on the O2 saturation.
4. Establish at least one large bore IV with .9% NACL
5. Obtain history of the type of burn and burn exposure and determine percentage of burns and depth. Use parkland formula for fluid replacement.
6. Dress burns accordingly, wet burns with moist dressings and dry burns with dry dressings. Avoid salves or ointments.
7. Consider Morphine for pain ( patient may require up to 20 mg's but be cautious of respiratory depression and blood pressure).
8. Treat associated injuries
9. Contact appropriate medical facility for further orders and transport

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KBEMS Form 30 084A  
090909

## STROKE / CVA

**RATIONAL:** Stroke also known as brain attack or cerebral vascular attack (CVA) is the third leading cause of adults in the United States. Each year 700,000 people suffer a stroke. Five hundred thousand of these strokes are first occurrences, while the rest are repeat strokes. Every 45 seconds someone has a stroke in the United States and strokes account for a death every three to four minutes. Yet up to 40% of people in a recent study could not identify a single symptom of stroke. The estimated total cost of a stroke is \$42 billion in the United States.

**DEMOGRAPHICS:** The risk for stroke in blacks is almost twice that of whites. Only 20% to 25% of patients who are admitted to the hospital with a stroke arrive in the emergency department within 3 hours of the onset of symptoms eliminating the possible treatment of tissue plasminogen activator. A rapid assessment is essential for definitive treatment. Of all strokes, 87 percent are ischemic, 10 percent are intracerebral hemorrhage, and 3 percent are subarachnoid hemorrhage.

### INTERVENTION INDICATORS:

Hemiparalysis	Vomiting
Head ache	Seizures
Blurred speech	Fever
Hypertension	Confusion
Drooling	Respiratory abnormalities
Dysphagia	Periods of apnea
Aphasia	Bowel and bladder incontinence
Apraxia	Uneven pupils
Lethargy or coma	

1. Secure airway, breathing and circulation  
Intubate if indicated
2. Oxygen 1 – 6 LPM N/C, 10 – 15 NRFM or 100% BVM
3. Provide a calm and reassuring atmosphere
4. History and time of onset is crucial to emergency care remember “OPQRST”
5. Use Cincinnati pre-hospital stroke scale in assessment.
6. Perform Cincinnati pre-hospital stroke scale
7. Establish an IV of .9 % NACL at TKO
8. Monitor EKG and document
9. Transport the patient on the affected side with their head elevated 15 degrees in a position of comfort.
10. Consider:  
Valium for seizures 5 – 10 mg’s IV  
Dopamine for hypotension 5 – 20 mcg’s

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KBEMS Form 30 086A  
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## Chest Injuries

RATIONAL: Trauma is the fourth leading cause of death in the United States and is the leading cause of death in children. Chest injuries are the leading cause of all trauma deaths. Chest trauma can result from a blunt or penetrating force to the chest and medical conditions such as spontaneous pneumothorax. There is potential to damage vital organs such as lungs and heart. When treating, be cautious as there can be other major injuries such as possible spinal injury. The injuries cause four specific etiologies; fractured ribs, flail segment, collapsed lung, and sucking or open chest wounds including gunshot wounds to the chest.

### INTERVENTION INDICATORS:

Cyanosis	Dyspnea
Jugular vein distension	Muffled heart tones
Hypotension	Subcutaneous emphysema
Absent breath sounds	Hyperresonance to percussion (Pneumo)
Tracheal deviation	Dullness to percussion (Hemo)
Anxiousness	

1. Secure airway, assess breathing and circulation and intervene as necessary with C- spine precautions.
2. Oxygen 1- 6 LPM n/c, 10-15 LPM/NRFM or 15LPM/BVM.
  - A. Endotracheal intubation as indicated  
Consider RSI per protocol
  - B. Combi-tube as indicated
3. Control major hemorrhage and stabilize flail segments
4. Establish at least one large bore IV of .9 % NACL and replace fluids as indicated (do not spend valuable time on the scene to start the IV, trauma patients are not saved in the field)
5. Monitor EKG and document
6. Decompress tension pneumothorax
7. Contact the appropriate medical facility and transport

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KBEMS Form 30 088A  
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## Abdominal Injury

**RATIONAL:** Abdominal injuries can be classified into two general categories; blunt and penetrating. Symptoms are variable depending on the nature of the injury. Blunt abdominal trauma is a leading cause of morbidity and mortality among all age groups. These injuries can be as severe as the penetrating type, but more difficult to diagnose. Identification of serious intra-abdominal pathology is often challenging. Their most immediate life-threatening consequences are hemorrhage and hypovolemic shock; later threats include infection. The prognosis depends on the extent of injury and on which organs are damaged. Many injuries may not manifest during the initial assessment and treatment period. The liver and spleen seem to be the most frequently injured organs, although reports vary. Small and large intestines are the next most injured organs, respectively. The male-to-female ratio is 60:40, according to national and international data.

### INTERVENTION INDICATORS:

Closed / blunt trauma	Open / penetrating trauma
Pain to the area	Obvious entry wound
Guarding from pain	Hemorrhaging
Tachycardia	Bowel evisceration
Hypotension (s/s shock)	Hypotension (s/s shock)
Distended abdomen	Distended abdomen
Discoloration, firm or rigid	Distended or rigid
Hypoactive bowel sounds	

1. Secure airway, assess breathing and circulation and intervene as indicated.
2. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM, or 100% BVM .
3. Cervical and Spinal immobilization as indicated
4. Dress eviscerations with sterile saline soaked dressings, cover dressings with occlusive dressings to retain heat and moisture.
5. Immobilize impaled objects
6. Establish IV of .9 % NACL at a rate to maintain systolic BP > 90 mmHg
7. Monitor EKG and document
8. Contact appropriate medical facility and transport

## Head Injuries

**RATIONAL:** About two million head injuries of all types (including skull and facial fractures) occur each year in the U. S.. Approximately 300,000 of those individuals suffer brain injuries severe enough to require hospitalization, with 99,000 resulting in a lasting disability. A total of 56,000 people die each year as a result of traumatic brain injury. Every 5 minutes someone dies from a head injury. The direct and indirect costs of traumatic brain injury in the U. S. have been estimated to be \$48.3 billion annually. The lifetime costs for one person surviving a severe TBI can reach \$4 million.

**DEMOGRAPHICS:** Males between the ages of 14 and 24 have the highest rate of injury. Males are almost twice as likely to suffer serious brain injuries as females. Brain Injuries kill more Americans under the age of 34 than all other diseases combined

### INTERVENTION INDICATORS:

Decreased level of consciousness	Pupil changes
Irregular respirations	Battle signs
Coons eyes	Posturing decorticate and decerebrate
Headache	Hypertension
Amnesia	CSF from nose or ears
Dysrhythmia's typically bradycardia	

1. Airway breathing and circulation
2. Cervical and Spinal immobilization
3. Oxygen as indicated by vital signs, O2 Sat's and PaCO2 between 25 – 30 mmHg
4. Establish at least one large bore IV with .9 % NACL administer to maintain a systolic BP >90 mmHg
5. Dress open wounds and cover orifices with CSF seeping
6. Consider;  
Valium 5 – 10 mg's for seizures
7. Contact the appropriate medical facility and transport

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KBEMS Form 30 092A  
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## Spinal Trauma

RATIONAL: Spinal cord injuries are physically and emotionally devastating. It is estimated that the annual incidence of spinal cord injury (SCI) is approximately 40 per million in the United States, with approximately 11,000 new cases each year. It predominantly affects males, at a rate of 4:1 to females. These are young patients, with a mean age of 35 years. Most people with neurologically complete lesions above C-3 die before receiving medical treatment. Those who survive are usually dependent on mechanical respirators to breathe. Pre-hospital management of spinal cord injury is of critical importance since 25% of spinal cord injury damage may occur or be aggravated after the initial event. Paralysis from injury could be a temporary sequela of spinal shock or permanent. 52% of spinal cord injuries are considered paraplegic and 47% are considered quadriplegic. Always immobilize even if the mechanism of injury remotely suggest the possibility of injury.

### INTERVENTION INDICATORS:

Paralysis	Incontinence
Dyspnea	Parathesias
Hypotension	Tachycardia
Diaphoresis	Tenderness
Pain	

### TREATMENT:

1. Secure airway, breathing, and circulation
2. Control C-spine and apply a cervical collar
3. Oxygen 1 – 6 LPM N/C or 10 – 15 LPM NRFM
4. Log roll patient onto LSB and secure, when secured, may open front of collar to observe neck
5. Establish IV of .9% NACL at TKO unless otherwise indicated by vital signs  
Be alert for signs of spinal shock
6. Contact the appropriate facility and transport
7. Consider:  
Solu-Medrol 125 – 250 mg's IV

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KBEMS Form 30 094A  
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## MULTIPLE SYSTEMS TRAUMA

**RATIONAL:** One out of every three people will be either directly or indirectly affected by trauma. According to the Centers for Disease Control and Prevention (CDC), unintentional injury kills more people under the age of 44 than any other disease or illness. It is a fact that a trauma occurs every four seconds. Six minutes from now, someone in the United States will die from trauma and another will be permanently disabled.

Each year trauma accounts for 37 million emergency department visits and 2.6 million hospital admissions across the nation. The majority of deaths occur in the first several hours after trauma. Rapid assessment, treatment and transport are essential to the survival of the trauma patient.

### INTERVENTION:

1. Insure scene is secure and safe
2. Secure airway, breathing and circulation
  - Intubate as indicated or Cricothyrotomy with physicians order
  - Consider RSI to control combativeness
    - Amidate: 0.2-0.6 mg/kg
    - Succinylcholine: 0.5-1.5 mg/kg
    - The following only after tube confirmation based on capnography
    - Versed: 5-10mg
    - Vecuronium: 0.04 mg/kg
    - Cricothyrotomy tray (for emergency use)*
3. Control major hemorrhage and C-spine
4. Oxygen 10 – 15 LPM NRFM or BVM at 100%
5. V/S, history, and physical exam
  - Mechanism of injury
  - Life-threatening injuries
  - Shock or respiratory failure
  - Preservation of life takes precedence over all other considerations
6. Stabilize all injuries before moving unless other factors place the patient in jeopardy.
7. Apply C-Collar and fully immobilize the patient on a LSB
8. Establish at least one large bore IV of .9 % NACL to maintain a systolic BP > 90 mmHg.
  - Do not prolong scene or transport time to establish IV's, survival is dependent on rapid surgical intervention.*
9. Asses blood glucose reroute and treat accordingly
10. Treat seizures with Valium 5 – 10 mg's IV
11. Contact the appropriate trauma center to activate the trauma plan and any further orders
12. Transport

This form supersedes no other

FBEMS Form 30 094A  
091109



## Orthopedic Injuries

RATIONAL: A fracture is a break in the continuity of a bone. Two generalized categories of fractures are open or compound and closed. Fractures can be further subdivided into; green stick (common in children) one side of the long bone is bent and the other side is fractured, simple fracture where there is a break but usually no separation of the bone and it is not exposed, a comminuted fracture where the bone is splintered and there can also be multiple fractures to a bone. A open or compound fracture is when the fracture has made an open wound to the skin and bone can be exposed. Typically fractures are caused by injury, however, older patients often develop osteoporosis from a lack of calcium in their diet which causes bones to spontaneously fracture.

### INTERVENTION INDICATORS:

Pain	Swelling
Deformity	Numbness
Tingling	Contusions
Abrasions	Punctures / penetrations
Tenderness	Crepitus
Limited mobility or none	

1. Secure airway, breathing and circulation
2. Oxygen 1 – 6 LPM N/C or 10 – 15 NRFM
3. Cervical and spinal immobilization if indicated
4. Straighten only grossly angulated fractures and insure distal extremity has pulses  
Most fractures are splinted as found
5. Splint extremity fractures
6. Apply ice packs for swelling
7. Establish an IV of .9 % NACL at TKO unless otherwise indicated by vital signs
8. Consider:
  - MS04 2-4 mg's IV slow push
  - Demerol 25 – 50 mg's slow puch
  - Nubain 10 mg's in a 70 Kg. patient every 3 – 6 hours not to exceed 160 mg's daily
  - Fentanyl 50 – 200 mcg's IV slow push
9. Contact appropriate medical facility and transport

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KBEMS Form 30 098A  
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## **Drowning/Near drowning**

RATIONAL: In 2000, there were 3,482 unintentional drownings in the United States, an average of nine people per day. 1 in 4 fatal drowning accidents involve children 14 and under. Drowning is the leading cause of death in children 4 and under and the second leading cause of death in children under 14. For every child that dies, another 4 are treated in the emergency room for submersion-related accidents, some of which cause permanent brain damage. Males and African Americans are statistically at higher risk.

### INTERVENTION INDICATORS:

Altered mental status	Seizures
Unresponsiveness	Coughing
Vomiting	Choking
Apnea	Dyspnea
Tachycardia	Bradycardia
Pulseless	Pale / cyanotic
Abdominal distention	Cool / clammy skin

1. Do not attempt to rescue a near-drowning victim unless you have been trained in water rescue.
2. Remove the victim from the water and always assume a neck injury.
3. Assess airway, breathing, and circulation
4. Oxygen 1 – 6 LPM N/C, 10 – 15 LPM NRFM, or 100% BVM for non-breathers  
Intubate as indicated  
Be alert for vomiting and have suction ready
5. Initiated CPR as indicated
6. Monitor EKG and document
7. Establish an IV of .9 % NACL at TKO  
Because water conducts heat 25 to 30 times more than air and rescuers should observe for signs and symptoms of hypothermia. Hypothermia can be a benefit and trigger the mammalian diving reflex.
8. Contact the appropriate medical facility and transport
9. Follow AHA algorithms' as indicated

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# Anaphylaxis

**RATIONAL:** Anaphylaxis is the most severe kind of allergic reaction, usually involving several body systems. Anaphylactic allergy is exposed to an allergen; their immune system goes into overdrive. The substances it produces, such as histamine, are intended to protect the body, but they go much too far, causing the throat to swell up and the blood vessels to leak fluid. Severe allergic emergencies affect an estimated 3 million to 40 million Americans and causes up to 1,500 deaths each year. The symptoms can occur within minutes of exposure to the offending allergen or may develop up to two hours later. The most common cause of death is from cardiovascular collapse or laryngeal edema that occludes the airway.

**DEMOGRAPHICS:** Before age 16, anaphylaxis is more common in boys than in girls. After age 30, it is more common in women than in men. Race and geographic location do not affect the risk of anaphylaxis. Up to 6 percent of the general population has an allergic sensitivity to latex

## INTERVENTION INDICATORS:

Hypotension	Dizziness
Diaphoresis	Syncope
Hives / urticaria	Nausea
Cramping	Diarrhea
Vomiting	Angioneurotic edema
Wheezing	Dyspnea
Chest pain	Flushing
Headache	Itching
Seizures	Bradycardia / tachycardia
Cool, clammy skin	Unconsciousness
Dysrhythmias	

1. Secure airway, breathing and circulation
2. Oxygen 10 – 15 LPM NRRM or 100% BVM  
Intubate as indicated, laryngeal edema can occlude an airway in minutes. (severe reactions may require a Crico-thyrotomy)
3. Place patient in the shock position as indicated
4. Assist patient with auto-injector or;  
Administer 0.3 – 0.5 mg's of 1:1000 Epi sub-q  
If severe reaction or hypotensive, administer 0.3 mg's of 1:10,000 IV
5. Establish IV of .9 % NACL at TKO unless hypotensive and then 500 cc fluid challenge
6. Consider:  
Dyphenhydramine 25 – 50 mg's IV  
Albuterol 2.5 mg's nebulized  
Atrovent .5 mg's nebulized  
Solu-Mederol 125 – 250 mg's IV
7. Contact the appropriate medical facility and transport

This form supersedes no other

KBEMS Form 30 102A  
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