

1. Introduction to the national Emergency Medical Technician Basics treatment protocol

The goal of Emergency Medical Services system is to provide the optimum out-of- facility medical care to all community members presenting with labor and delivery emergencies, acute illnesses, and injuries in a timely and efficient manner. The treatment protocols found in this text are designed to immediately manage emergent patient illnesses, injuries and maternal related emergencies that rapid intervention by EMT- Basics and Intermediate personnel will alleviate patient suffering and ultimately allow the patient to be delivered to a receiving health facility in an already improved clinical state whenever possible.

This Treatment handbook establishes the acceptable standard of care for managing patient with injuries, acute illness and maternal & child related emergencies by certified EMTs working for ambulance services in the country. The narrative format allows the protocols to serve as a reference text when needed, while the algorithmic treatment sections provide guidance in the acute situation.

1.2 RESPONSIBILITIES OF EMS PROVIDERS

EMTs working for ambulance services providing pre- facility patient care in Ethiopia have an obligation to understand the nation EMS system, and the EMS System regulations and to provide patient assessment and care in accordance with these nationwide Treatment Protocols and their training.

Proper use of adequate communications equipment is essential to an effective system operation; early, accurate, brief and well-organized communication and notification with the receiving facility should be required in each EMS system.

In accordance with the EMS System regulations and administrative requirements, a properly completed trip record for each patient management situation is mandatory, and a minimum EMS record for each transport must be maintained on the trip record.

Trip record information is critical, so that systems-wide improvement can be undertaken by identifying issues important to the out of hospital management of patients.

EMTs may request medical direction on call where management is beyond the standing order and whenever they fill the need. Early and concise reporting to the receiving facility is strongly recommended in all EMS systems.

1.3 GENERAL RULES APPLICABLE TO CARE OF ALL EMS PATIENTS

- Maintain scene safety. In accordance with your EMT training, this means:
 - Assure your safety from imminent threat of harm.
 - Maintain appropriate body substance isolation precautions, proper management of patients such that the provider and the patient are protected from undue exposure to communicable diseases.
- EMS providers and destination facilities must adhere to a reporting mechanism for infectious-disease exposure. The following steps should be taken at the scene of every patient encounter:
 - a) Assure scene safety.
 - b) Body substance isolation.
 - c) Determine mechanism of injury/nature of illness.
 - d) Determine total number of patients.
 - e) Evaluate need for additional resources (fire and rescue units, law enforcement, ALS team, and other specialized search and/or rescue units if available).
- Begin assessment and care at the side of the patient, in accordance with your EMT training.
- Bring with you to the patient all equipment and monitoring devices needed to allow you to function to the level of your certification, up to the level of service at which the ambulance you are on is operating.

This is critical, so that you may gather complete assessment information that will allow you to properly treat patients to the appropriate level without delay.
- Provide rapid transport to the nearest appropriate treatment facility as defined in EMS regulations.
- Remember that ambulance crashes are a threat to both crew and patients: use lights and sirens only when indicated due to patient condition or circumstances.
- Request and use Advanced Life Support backup from health facility that is closer to your area whenever indicated

- Do not allow patients with significant medical or traumatic conditions to walk, or otherwise exert themselves. You are taught in your EMT training several ways to safely carry and/or lift and move patients, and you must use such procedures and appropriate devices in moving patients.
- When moving a patient on an ambulance bed, adjust the height of the ambulance bed down to the safe position for moving a patient, in accordance with manufacturer's instructions. All EMTs moving the patient must keep both hands on the ambulance bed at all times.
- Properly secure all patients, especially children, to the ambulance bed, using all of the required straps, or in an approved infant/child carrier or seat, or harness, or in an appropriate immobilization device, in a position of comfort, or in a position appropriate to the chief complaint, and/or the nature of the illness or injury.
- All stretchers have to be equipped with an over the shoulder harness, hip and leg restraining straps.
- Proper securing of a patient means the use of all required straps, at all times. If patient care requires that a strap be removed, the strap must be re-secured as soon as practical.

1.4 General principles and requirements regarding specific EMT skills

- Communication system: familiarity with available communication system is essential
- Personnel communicating with EMS field providers must have a working knowledge of the nationwide EMS system and be fully aware of the skills and capabilities of the EMS providers with whom they are communicating.
- Health facilities health professionals providing Medical Direction must be familiar with the communication system and its usage and must also know the treatment guidelines established in this document for the level of EMT- Basics.
- Health facility personnel and EMS providers must respect patient confidentiality.
- Medical directors for EMT services must take an active role in reviewing EMT performance in the delivery of patient care.

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3. Medical Emergencies

3.1. Adult Upper Airway problems/illness

Causes of airway illness include:

- Obstruction of the pharynx by the tongue in the unconscious patient;
- Foreign bodies in the oropharynx, trachea, or esophagus (commonly large pieces of meat or food);
- Allergic swelling of upper airway structures ("angioedema");
- Chemical burns; inhalation injuries;
- Altered mental/Neurological status and congenital abnormalities (patients with small jaws or large tongues).
- Infectious causes are, epiglottitis, and retropharyngeal or peri- tonsillar abscess.
- Trauma resulting in upper tracheal or laryngeal injury may also result in airway and breathing difficulties.

3.2. General approach to airway problems:

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Determine presence of upper airway problems (stridor):
- c. If ***partial obstruction*** due to a foreign body is suspected and the patient has adequate breathing effort: transport to appropriate medical facility. ***Do not attempt to remove foreign body in the field.***
- d. If foreign body is visible and readily accessible, attempt removal with Magill forceps.
- e. Provide positive pressure ventilations with bag valve mask if needed.
- f. **If suspected epiglottitis (stridor, drooling)**, place patient in position of comfort. and avoid upper airway stimulation.
- g. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- h. Determine patient's hemodynamic stability and symptoms. Continually assess level

of consciousness, ABCs and Vital Signs.

- i. Obtain appropriate history related to event, including recent infectious history (fever, cough, etc.) or exposure to allergens.
- j. Monitor and record vital signs and respond as you find
- k. Initiate transport as soon as possible,
- l. Properly secure to bed, immobilization device, in position of comfort, or appropriate to treatment(s) required.

3.3. Basic adult airway management protocol

3.3.1. Unconscious but has adequate breathing Or spontaneously breathing patients

- a. Put them on recovery/left lateral position
- b. Consider supplemental oxygen in patients protecting their own airway to maintain O₂ saturation > 95%.
- c. Give oxygen via Nasal cannula at 2 to 6 liter per minute - **OR** –
- d. Use Facemask at 10 to 15liter per minute.
- e. Use pulseoxymeter to measure oxygen saturation and record readings.
- f. Remember C- spine precaution if patient has history of trauma

3.3.2. Unconscious Inadequate Breathing:

- a. Basic maneuvers first: open airway- head tilt chin lift for none trauma patients and jaw thrust for trauma patient
- b. Consider placement of a nasal airway in semi conscious patient or oral air way in deeply unconscious patients
- c. Face mask with supplemental oxygen at 10 to 15 liter per minute - or
- d. Bag-valve-mask (ambubag) with 100% oxygen if the breathing effort is not adequate. Consider oral airway if the chest is not expanding well during bag-valve-mask assistance.
- e. For adults, ventilate once every 5 to 6 seconds (10 to 12 times per minute).
- f. If signs of airway obstruction present (no chest movement) reassess the patient for possible presence of foreign body or tongue is falling back on patient who is deeply comatose.
- g. Suction if there is excessive secretions, see for any foreign body and remove if it is accessible, proceed to use oral air way, get an assistant and

use your both hands for jaw thrust and ventilate with ambu bag, if saturation is above 92% continue bagging.

- h. If you couldn't ventilate use Laryngeal Mask Airway (LMA) OR ,Combitube
- i. Communicate with receiving health facility or medical oversight if available
- j. Transport patient to nearby health facility as fast as possible and maintain your care during transportation

3.3.3. Specific airway problems

3.3.3.1. Obstruction due to a foreign body

In order to treat a choking patient it is important to recognize the condition. Try to ascertain what material is causing the obstruction.

Signs and symptoms

- Chocking has a sudden onset
- Patient will be obviously distressed and agitated.
- The face is likely to be congested (red),
- The patient may be holding their throat (universal sign).
- The patient may be standing up and leaning forward.
- Difficulty in breathing and/or speaking.
- Cyanosis (late sign, blueness around the lips).
- Unconsciousness (late and pre-arrest sign).

Treatment

Conscious /partial obstruction

- a. Your initial action in this situation should be to reassure the conscious patient and encourage them to cough, if this proves unsuccessful you should:
- b. Give oxygen
- c. Transport

Conscious /complete obstruction

- a. Stand to the side and slightly behind the patient.
- b. Support the chest with one hand; lean the patient forwards so that if the object becomes dislodged it will not go further down the windpipe but be ejected.
- c. Give FIVE firm blows with the heel of the hand between the shoulder blades.
- d. If this fails abdominal thrusts should be used. Stand behind the patient and place both arms around the upper part of the abdomen, just below the ribcage

- e. Hold one fist within the other hand and pull sharply inwards and upward up to FIVE times.
- f. If unsuccessful return to 5 back blows and alternate with abdominal thrusts until the obstruction is removed or patient becomes unconscious.
- g. For technical application See picture on the annex part

If Unconscious

- Despite the actions previously described and if the patient does not have pulse commence CPR.
- Loss of consciousness will lead to a relaxation of the muscles in the throat and this may allow some air to pass beyond the obstruction and into the lungs, therefore give 2 rescues breathing during the CPR. See CPR protocol
- If the object is visible attempt finger sweep or remove using Magill forceps.

3.3.4. Airway problem due to Tracheostomy tube obstruction

- In the patient with an obstructed tracheostomy tube, in whom no effective ventilation/oxygenation is possible, the following are to be considered
 1. Wipe neck opening with gauze
 2. Attempt to suction tracheostomy tube
 3. Remove tracheostomy tube if necessary
 4. Once airway is open, give oxygen as necessary/possible
 5. Consult or Notify receiving hospital when necessary
 6. Transport to the health facility

3.3.5. Respiratory distresses

Respiratory Distress is defined as:

- Inadequate breathing in terms of any of the following: bradypnea (slow breathing) or tachypnea, (fast breathing) and/or depth of breathing (shallow, labored, with use of accessory muscles)
- Persons who are breathing too fast or too slow may not be receiving enough oxygen to support bodily functions and may suffer an increase in blood carbon dioxide to dangerous levels.
- Irregular breathing can be a sign of a serious medical problem and needs to be

evaluated by a physician.

- Quality of breathing interms of either unequal breathes sounds, noisy breathing (rales, rhonchi, wheezes, snoring, stridor), use of accessory muscles, and/or nasal flaring (especially in children) are a sign of serious respiratory tract problem that needs urgent treatment at health facility
- Cyanosis is usually a late sign and requires immediate treatment.

Assessment/ treatment priorities of respiratory distress

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist ventilation as needed.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Continually assess Level of Consciousness, ABCs and treat accordingly
- e. Take vital signs when a patient ABCD is stabilized.
- f. Obtain appropriate history related to event, including prior asthma, anaphylaxis, and allergies.
- g. Identify exposures to foreign body, foods, medicines, chemicals or envenomation should be ascertained.
- h. Determine if patient is in mild or severe distress:
 - **Mild Distress:** Slight wheezing and/or mild cough. Able to move air without difficulty.
- i. Do not delay transportation
- j. Monitor and record vital signs and ECG if available
- k. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

Mild distress management

If the patient has not taken the prescribed maximum dose of their own inhaler prior to the arrival of EMS, and if the inhaler is present:

- Encourage and/or assist patients to self-administer their own prescribed inhaler medication if indicated or if not already done.
- If patient is unable to self-administer their prescribed inhaler, administer patient's prescribed inhaler.
- Reassess vital signs

- Repeat a second dose if required, and if prescribed maximum dose has not been administered,
- Contact MEDICAL CONTROL/receiving health facility for further management while you are transporting the patient.
- Put the patient in a position of comfort, or appropriate to treatment(s) required.

Severe Distress: Evidenced by poor air movement, difficulty to speak, dyspnea, (difficulty of breathing), and use of accessory muscles, tachypnea and/or tachycardia.

NOTE: Severe bronchospasm may present without wheezes, indicating minimal air movement,

Sever distress management

- ✓ Requires urgent treatment at health facility
- ✓ Don't delay transportation to nearby health facility
- ✓ Reassure the patient
- ✓ Put the patient in a position of comfort,
- ✓ Administer high flow humidified oxygen with face mask
- ✓ Encourage and/or assist patients to self-administer their own prescribed inhaler medication if indicated or if not already done.
- ✓ If patient is unable to self-administer their prescribed inhaler, administer patient's prescribed inhaler.
- ✓ Monitor vital signs and if the blood pressure is below 90mm/HG give bolus 250ml normal saline
- ✓ Do not delay transportation if you have difficulty to secure IV lines
- ✓ Consult the nearby health facility or medical oversight while transporting
- ✓ Try to identify the cause of the severe distress and act accordingly and tell the consulted body the possible reason and act according his recommendation

3.4. Cardiac emergencies

3.4.1 A systole/Cardiac arrest

Definition

Is the complete cessation of cardiac activity, either electrical, mechanical, or both. It is indicated in the field by the absence of a carotid pulse.

- Possible Causes:

1. Drug overdose,
2. Hypokalemia,
3. Hypoxemia,
4. Hypothermia,

▪ **ASSESSMENT / TREATMENT PRIORITIES**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Determine unresponsiveness, airway patency and absence of breathing
- c. Maintain an open airway with appropriate device(s), remove secretions, vomitus,
- d. If still no breathing give 2 rescue breaths and check for circulation on the neck- carotid artery for not more than 6 seconds if no pulse,
- e. Initiate CPR at lower 1/3 of the sternum, (“push hard, push fast”, limit interruptions), and deliver supplemental oxygen, in 2:30 ratio using bag valve mask device
- f. Continue CPR until patients heart activity is resumed or until you reach to health facility
- g. If the patient responds to your management (that is restart breathing, pulse is palpable, consciousness is improving, continue to assess level of consciousness, ABCs and Vital Signs, continue oxygen delivery with mask or nasal prong, open IV line, Initiate IV Normal Saline if possible. Administer 250-cc/ bolus IV NS
- h. Do not delay patient transportation to search difficult IV access ,
- i. Put the patient on recovery position
- j. Notify receiving health facility.
- k. Obtain appropriate history related to event, including possible ingestion or overdose of medications, specifically calcium channel blockers, beta-blockers and / or digoxin preparations and determine the possible causes of asystole/cardiac arrest in the patient.

3.4.2. Brady Arrhythmias

Definition heart rates less than 60/min.

- Causes
 - Hypoxemia,

- Acidosis, hypothermia,
- Toxic ingestion or exposure,
- Damage to the cardiac conduction system (e.g. infarct), and late shock.
- Late finding in cases of raised intracranial pressure (ICP) due to head trauma, infection, or CNS tumor.
- Out of hospital treatment is directed to the symptomatic patient only.
- In treating bradycardia, "treat the patient, not the monitor" should be emphasized.
- REMEMBER: EMS providers must be aware of the concept of "relative" bradycardia, i.e., the patient's pulse rate in relation to the patient's blood pressure and clinical condition.

▪ **ASSESSMENT / TREATMENT PRIORITIES**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. If patient is asymptomatic despite low rate of pulse: blood pressure is optimal, no chest pain, and no shortness of breathing; reassure the patient put on position of comfort, reassure, give oxygen via nasal catheter, reassure and transport to nearby health facility
- c. **Symptomatic patients will have**
 - Accompanied by decreased level of consciousness,
 - Abnormally slow heart rates(<60 beats/minute)
 - Weak pulses
 - Hypotension (systolic blood pressure less than 90mm Hg).
 - Loss of consciousness
- d. If patient is unconscious maintain an open airway with appropriate device(s),
- e. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- f. Remove secretions, vomitus, etc., be prepared to initiate CPR and assist ventilations as needed.
- g. Continually assess level of Consciousness, ABCs and Vital Signs.
- h. Obtain appropriate history related to event, including possible ingestion or

overdose of medications, specifically calcium channel blockers, beta-blockers, and digoxin preparations.

- i. Monitor and record vital signs and ECG if available.
- j. Initiate transport as soon as possible.
- k. Do not allow patients to exert themselves
- l. Transport unconscious patients in recovery/left lateral position
- m. If systolic blood pressure drops below 90mmHg, administer 250ml bolus of IV Normal saline or titrate to patients hemodynamic status,
- n. Contact MEDICAL CONTROL/receiving health facility for further management while you are transporting the patient.

3.4.3. Acute Coronary Syndrome (ACS)

Definition

Represents a spectrum of disease. There are at least three conditions identified within the spectrum of ACS: Classic angina chest pain; atypical chest pain; angina equivalents;

Classic Anginal Chest Pain	Atypical Chest Pain	Anginal Equivalents
1. Central anterior pains;	1. Epigastric discomfort	1. Dyspnea,
2. Chest Pressure, tightness	2. Musculoskeletal	2. Syncope
3. Crushing radiates to arms, neck, back	3. Often-unilateral	3. "Generally weak"
	4. Palpitations	

Additional signs and symptoms of an ACS patient may be;

- Sudden onset of diaphoresis (cool, clammy, wet skin often profuse),
- Anxiety,
- Restlessness,
- Abnormal vital signs such as an irregular pulse rate, low blood pressure
- Nausea / vomiting.

NB.

- All ACS patients must be carefully monitored until a definitive diagnosis can be made at the hospital
- All patients with ACS-like symptoms of a non-traumatic etiology should be considered to be of cardiac origin until proven otherwise.

- **Assessment/ treatment priorities**
 - a. Ensure scene safety and maintain appropriate body substance isolation precautions.
 - b. Maintain open airway if patient is unresponsive
 - c. Determine adequacy of breathing by observing chest movement and feel air movement around the nose and mouth
 - d. If pulse oximetry is available, measure saturation and give supplemental oxygen only if the oxygen saturation level is less than 94%.
 - e. Give oxygen via Nasal cannula at 2 to 6 liter per minute *if still the saturation is low <94%* Use Facemask at 10 to 15 liter per minute.
 - f. Put all unconscious patients on recovery/left lateral position
 - g. If the patient is conscious, position on semi sitting position, and reassure patient
 - h. Determine patient's history of allergies, and administer aspirin (Dose= 300 mg., chewable preferred) if not contraindicated and if not already administered.
 - i. Obtain appropriate history and assessment related to event.
 - j. Monitor and record vital signs.
 - k. Initiate transport as soon as possible,
 - l. If patient complains of chest pain, chest pressure or chest discomforts, administer nitroglycerin (NTG), 1 tablet or spray sublingual, if available.
 - m. If SYSTOLIC BLOOD PRESSURE is greater than 100mm Hg , you May repeat dosage in 5 minute intervals times two (x2), to a maximum of three doses.
 - n. If SYSTOLIC BLOOD PRESSURE drops below 90mm Hg ,Keep IV open administer a 250ml bolus of IV Normal saline or titrate to patients blood pressure response
 - o. Contact and report on the patient's condition to medical control or receiving health institution

3.4.4. Ventricular fibrillation/pulse less ventricular tachycardia –: Cardiac arrest

- Definition: abnormal, shaking type heart beat that leads to low perfusion of the brain and heart that followed by cardiac arrest
- The need for early defibrillation is clear and should have the highest priority.
- Since these patients will all be in cardiopulmonary arrest, use of adjunctive equipment should not divert attention or effort from Basic Cardiac Life Support (BCLS)

resuscitative measures, and early defibrillation and Advanced Cardiac Life Support (ACLS).

- Remember: rapid defibrillation and early ACLS is the major determinant of survival.
- Causes: it can happen to people without prior cardiac disease or in patients with prior cardiac lesion.

- **Assessment / Treatment Priorities**
 - a. Ensure scene safety and maintain appropriate body substance isolation precautions.
 - b. Consider all potential non-cardiac causes (i.e. electric shock and remove from danger).
 - c. Determine unresponsiveness, by touching and communication
 - d. Shout for help if you are alone
 - e. Assess the airway and determine absence of breathing
 - f. Maintain an open airway with appropriate device(s), remove secretions and vomitus,
 - g. Initiate CPR 2:30 ratio either you are one or two (“push hard, push fast”, limit interruptions), if there is no visible sign of life check carotid pulse after every 5 cycle of 2breaths and 30compressions
 - h. Administer oxygen using Bag Valve Mask and avoid hyper ventilation and over expansion/inflation of the chest and abdomen
 - i. Continue CPR and assist ventilations while attaching AED if available. If not available continue CPR and transport patient to nearby health facility
 - j. Notify receiving hospital, and get advice on the further management of the patient
 - k. Initiate IV normal saline if possible, but **do not delay** evacuation/transportation of patients, if you have an open IV LINE give 250ml bolus and give Epinephrine 1 mg IV push every 3-5 minutes; rinse with 10cc normal saline after every push of the drug and continue CPR
 - l. Continue CPR and defibrillate according the AED instruction
 - m. Continually assess Level of Consciousness, ABCs and Vital Signs, following successful resuscitation/CPR
 - n. Obtain appropriate history related to event.

3.4.5. Ventricular Tachycardia with Pulses

Definition

- Ventricular tachycardia represents a grave, life-threatening situation in which the patient requires immediate treatment.
- The diagnosis is suggested any time three or more premature ventricular beats occur in succession.
- With ventricular tachycardia, cardiac output may drop dramatically or be absent altogether and progress into ventricular fibrillation.

STABLE:

- Presents with pulses,
- Patient conscious,
- Without chest pain,
- Systolic Blood pressure greater than 90mm Hg.

UNSTABLE:

- Presents with pulses, but is severely symptomatic:
- Chest pain,
- Palpitations,
- Shortness of breath (SOB),
- Signs and symptoms of congestive heart failure (CHF), hypotension (systolic Blood pressure less than 90mm Hg), decreasing level of consciousness (LOC) or unresponsive.

▪ **Assessment/ treatment priorities**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Assess LOC and ABCs
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Monitor and record vital signs and ECG if available
- e. Do not allow patients to exert themselves
- f. Properly secure to cot in position of comfort or appropriate to treatment required.
- g. Keep IV open
- h. Obtain appropriate history related to event.
- i. Initiate transport as soon as possible,

- j. If systolic blood pressure drops below 90mm Hg, notify receiving hospital.
- k. Initiate IV normal saline if possible, but don't delay evacuation/transportation of patients, give 250ml bolus or titrate to patients hemodynamic status
- l. If cardio version is warranted, and patient is conscious consider administration of any of the following for sedation: Diazepam if patient < 70 kg: 2.5 mg slow iv push or, if patient > 70 kg: 5 mg slow iv push.
- m. If Systolic blood pressure is unstable (less than 90mm Hg): consider synchronized cardio version. (If available and you have proper training) Check rhythm and pulse between each attempted cardio version.

3.4.6. Congestive heart failure with pulmonary edema

Definition

- Severe congestive heart failure (CHF) and/or acute pulmonary edema are caused by acute left ventricular failure, resulting in pulmonary congestion.

Causes

- Most commonly these conditions are the result of myocardial infarction, diffuse infection, opiate poisoning, inhalation of toxic gases, and severe fluid over load
- Pulmonary edema is typically characterized by:
 - Shortness of breath,
 - Cough with frothy(reddish and foamy) sputum,
 - Anxiety,
 - Cyanosis,
 - Diaphoresis,
 - Rales and/or wheezing.

▪ **Assessment/ treatment priorities**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions
- b. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- c. Place patient in full sitting position as tolerated.
- d. Continually assess Level of Consciousness, ABCs.
- e. Obtain appropriate history related to event, including any Trauma (recent head injury/fracture).
- f. Monitor and record vital signs and ECG if available
- g. Initiate transport as soon as possible,
- h. Do not allow patients to exert themselves and properly secure to cot

- i. Notify nearby receiving health facility and inform the patient's condition and try to get advice on the further management of the patient
- j. If patient systolic blood pressure drops below 90mmHg, administer 250ml bolus of IV Normal saline or titrate to patient's hemodynamic status. Do not delay transportation of patient if you have problem in IV access
- k. Administer Nitroglycerin Sublingual tablet; 0.4 mg or NTG spray if systolic BLOOD PRESSURE is greater than 90 mm Hg. Nitroglycerin may be repeated in five (5) minute intervals times two (2) as dictated by patient's Blood Pressure. OR Furosemide 0.5 mg/kg - 1 mg/kg IV push (SLOWLY)

3.4.7. Hypertensive emergencies

Definition

- A hypertensive emergency is characterized by elevation of a patient's blood pressure greater than 180/120mm Hg), which might lead to significant, irreversible end-organ damage within hours if not treated.
 - The brain, heart and kidneys are at risk.
 - The patient may also present with restlessness, confusion, blurred vision, nausea and/or vomiting.
 - Hypertensive encephalopathy is a true emergency and is the direct result of untreated hypertension.
 - It is characterized by severe headache, vomiting, visual disturbances (including transient blindness), paralysis, seizures, stupor, and coma. This condition may lead to pulmonary edema, left ventricular failure or cardiovascular accident (CVA).
 - The goal of therapy for hypertensive emergencies is to reduce the BLOOD PRESSURE, on average, approximately 10% - 20% or until patient's clinical presentation is improved.
 - Caution should be taken to reduce the BLOOD PRESSURE in a controlled fashion as opposed to rapid reduction.
- **Assessment/ treatment priorities**
- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
 - b. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.

- c. Place patient in position of comfort.
- d. Continually assess Level of Consciousness, ABCs
- e. Obtain appropriate history related to event, including any Trauma (recent head injury), allergy, medication, past illness, last meal
- f. Monitor and record vital signs and ECG if available
- g. Do not allow patients to exert themselves and properly secure to cot in position of comfort,
- h. Notify medical oversight if available, or nearby receiving health facility and inform the patient's condition and try to get advice on the further management of the patient
- i. Keep IV line open en route to health facility; do not delay transportation of patient if you have problem in IV access.
- j. If possible and with discussion with the medical control/receiving health facility Administer Nitroglycerin Sublingual tablet; 0.4 mg or NTG spray

3.4.8. Shock

Definition

- Shock is defined as inadequate tissue perfusion and oxygenation
- Multiple causes of shock exist and include:
 - **Hypovolemia** (hemorrhage, burns, dehydration due to vomiting, diarrhea, hyperthermia...);
 - **Cardiogenic** (myocardial infarction, congestive heart failure, dysrhythmias)
 - **Obstructive** (cardiactamponed, pulmonary embolism, aortic dissection);
 - **Distributive** (infection,sepsis, poisonings, spinal cord injuries, anaphylaxis's)
- The patient with severe shock will typically present with sever hypotension or un-recordable blood pressure, severe tachycardia or bradycardia and changes in mental/neurological status (agitation, restlessness) eventually leading to confusion and coma.
- **Assessment/ treatment priorities**
 - a. Ensure scene safety and maintain appropriate body substance isolation precautions.
 - b. Assume spinal injury if trauma is suspected and treat accordingly.
 - c. Assess Level of Consciousness and ABCs, and manage accordingly
 - d. Control/stop hemorrhage

- e. Administer oxygen via appropriate device
- f. Monitor and record vital signs.
- g. Maintain body temperature.
- h. Initiate transport as soon as possible.
- i. Reassure patient
- j. Do not allow patients to exert themselves and properly secure to cot
- k. Place patient in supine position with legs elevated,
- l. If patient is unresponsive place lateral and elevate legs
- m. Activate ALS intercept, if deemed necessary and if available.
- n. Contact medical oversight or receiving health facility duty professional, explain the condition of the patient and the possible causes
- o. Open IV line with normal saline, give bolus 250 -500 ml continue resuscitation under consultation of medical control

3.5. Neurological emergency

3.5.1. Acute stroke

Definition

It is a leading cause of death and brain injury in adults. Once the diagnosis of acute stroke is suspected, pre-hospital care providers should make every effort to determine the time of onset of symptoms and to minimize time in the field. The suspicion of acute stroke mandates rapid transport.

▪ **Assessment/Treatment Priorities**

- a. Maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
- c. Avoid hyper oxygenation; administer oxygen using an appropriate oxygen delivery device, as clinically indicated.
- d. If pulse oximetry available, give supplemental oxygen only if the oxygen saturation level is less than 94%.
- e. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs.
- f. Obtain S-A-M-P-L-E history related to event. If possible, establish the time of onset of stroke signs and symptoms.

- g. Monitor and record vital signs and ECG if available
- h. Initiate transport as early as possible
- i. Properly secure patient to cot,
- j. Elevate head part of the stretcher approximately 15 cm
- k. Determine blood glucose level if available and contact medical control/receiving health facility about the patient condition
- l. If systolic blood pressure drops below 90mm Hg, secure IV line and give fluid to maintain BP to 90mm.Hg systolic
- m. If patient is unconscious or seizing, transport on left side (coma position)
- n. Spend as little time on scene as possible
- o. Place paralyzed side of the body down and well protected with padding
- p. Initiate transport as soon as possible, to nearest appropriate facility.
- q. Communicate the medical oversight for further management
- r. Notify receiving health facility

3.5.2. Syncope

Definition

Syncope is a brief loss of consciousness caused by inadequate perfusion of the brain. If the patient remains unconscious, they should be treated according to the "Altered Mental/Neurological Status" protocol.

3.5.3. Altered mental statuses

Definition

An alteration in mental/neurological status is the hallmark of central nervous system (CNS) injury or illness.

Causes

A common grouping of causes for altered mental/**neurological** status is the following: **A E I O U – T I P S**(**A**lcoholism, **E**pilepsy, **I**nsulin, **O**verdose, **U**nder dose, **T**rauma, **I**nfection, **P**sychiatric and **S**troke).

Altered mental/neurological status may present as mild confusion or complete unconsciousness (coma). Altered mental status may be a result of a medical condition, traumatic event, or both.

EMS agencies should use the Glasgow Coma Scale (GCS) or AVPU for their ongoing neurological assessment, as appropriate for the possible causes of the patient's condition.

Any alteration in mental/**neurological** status is abnormal and warrants further examination

▪ **Assessment/ treatment priorities**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist oxygenation and ventilations as needed.
- c. Assume spinal injury when appropriate and treat accordingly.
- d. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- e. Continually assess Level of Consciousness, ABCs
- f. Obtain appropriate S-A-M-P-L-E history related to event.
- g. Monitor and record vital signs.
- h. Initiate transport as soon as possible,
- i. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- j. If patient is a known diabetic who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated.
- k. Do NOT administer anything orally if the patient does not have a reasonable level of Consciousness and normal gag reflex.
- l. If patient is unconscious or seizing, transport on left side (coma position).
- m. If systolic blood pressure drops below 90mm Hg, administer 250 mL bolus of IV Normal Saline.
- n. Notify receiving hospital.
- o. Apply Cardiac Monitor: If available
- p. If obvious narcotic overdose:
 - **Naloxone 0.4-2 mg IV Push, IM, SC,**
 - **Thiamine 100 mg IV or IM**
 - Determine Blood Glucose level: If glucose is less than 70 mg/dL, administer **Dextrose 40%**, 20 ml IV Push. Additional Dextrose 40% may be administered as necessary. If no IV access, administer Glucagon 1-2 mg IM (if available)

3.5.4. Seizures

Definition

A seizure is a temporary alteration in behavior due to abnormal electrical discharge of one or more groups of neurons in the brain. Seizures can present in several different forms: generalized tonic/clonic seizure, partial/ simple, or partial/complex.

Causes

The single most common cause of seizure disorder is idiopathic epilepsy. However, there are multiple other causes: alcohol withdrawal syndrome, hypoglycemia, head trauma, vascular disorders, cerebrovascular accidents, overdose, infection, psychiatric, electrolyte abnormalities, eclampsia, hypoxemia, toxic exposure, drug withdrawal and structural brain disorders such as tumors.

The seizure may be followed by state of altered mental status or complete coma depending upon cause.

▪ Assessment/ treatment priorities

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Protect patient from injury,
- c. After ending of the seizure assess the airway and breathing and manage accordingly
- d. Administer oxygen, using appropriate oxygen delivery device, as clinically indicated
- e. Be certain that the oropharynx is clear of secretions and/or vomitus.
- f. Obtain appropriate (S-A-M-P-L-E) history related to event. Question witnesses or bystanders as to actual event if possible.
- g. The majority of seizures are self-limiting, followed by a gradual awakening. However, prolonged or recurrent seizures may indicate status epilepticus.

NOTE: Status epilepticus is considered to be occurring when it has been reported, or is known that, a patient has been seizing for 5-10 minutes or greater.

- h. Monitor and record vital signs
- i. Prevent / treat shock if there is any indication on your vital sign.
- j. Initiate transport as soon as possible
- k. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- l. Initiate IV line en rout to health faculty, and titrate the IV fluid to patient's hemodynamic status. Do not delay transportation of patient if you have problem in IV access.
- m. If patient is a known diabetic who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated. A second dose may be necessary.

CAUTION: Do NOT administer anything orally if the patient does not have a reasonable level of consciousness and normal gag reflex

- n. Notify receiving hospital.
- o. If obvious narcotic overdose: Naloxone 0.4-2 mg IV Push, IM, SC or Nasal via atomizer
- p. If patient with obvious alcohol abuse, malnourished state: Thiamine 100 mg IV or IM
- q. If glucose is less than 70mg/dL, Administer Dextrose 50%, 12.5 to 25 grams IV Push.
- r. **CAUTION:** If cerebrovascular accident is suspected, contact Medical Control/receiving health facility prior to glucose administration.
- s. If patient is in Status Epilepticus, administer:Diazepam 5 mg - 10 mg slowly IV push or Intramuscularly (IM) **CAUTION:** Benzodiazepines may affect breathing and be ready to assist the patient using ambubag
- t. Contact medical control or receiving health facility

3.6. Poisoning

- **Definition**

Poison is any substance/ chemical action can damage body structures or impair body functions. Routes of entry include: **ingestion, inhalation, injection or skin absorption.**

- **Causes**

The most common poisoning emergencies include, but are not limited to:

- ✓ Carbon monoxide,
- ✓ Corrosive agents (acids/alkalis),
- ✓ Hydrocarbons (gasoline, oil, pesticides, paints, turpentine, kerosene, lighter fluids, benzene, and pine-oil products),
- ✓ Methanol (wood alcohol),
- ✓ Ethylene glycol (anti-freeze),
- ✓ Isopropyl alcohol,
- ✓ Cyanide,
- ✓ Food poisonings (bacterial, viral, and non-infectious)
- ✓ Plant poisonings.
- ✓ Envenomation

The primary goal of physical assessment of the poisoned patient is to identify effects on the three vital organ systems most likely to produce immediate morbidity and/or mortality:

- ✓ Respiratory system,
- ✓ Cardiovascular system, and
- ✓ Central nervous system.

An "**overdose**" is the result of an individual's intentional/accidental exposure to a pharmacological substance(s). The most common drugs of abuse resulting in overdose are:

- ✓ Narcotics,
- ✓ Central nervous system depressants,
- ✓ Central nervous system stimulants.

General management principles should be directed towards patient's clinical status and suspected cause for their clinical condition.

Due to the complex nature of poisonings and substance abuse emergencies, it is strongly recommended that Medical Control be utilized in the initial management of these patients.

Assessment / Treatment Priorities

- a. Ensure scene safety and maintain appropriate body substance isolation, i.e. by ascertaining the source and type of poisoning. This is especially important when responding to industrial and/or farm accidents.
- b. Call appropriate public safety agencies: fire, rescue, or HAZMAT teams to properly stabilize the scene and rescue the victim(s) from the source of contamination.
- c. The patient will need to be removed from point of exposure and must be properly decontaminated.
- d. Rescuers will need to place patient in a safe environment such that the EMTs may administer emergency care.
- e. Take necessary precautions to protect yourself from contamination
- f. If the poison is on the skin, brush off dry chemicals before irrigation
- g. Assess the airway and breathing
- h. Maintain open airway and assist ventilations as needed. Airway management may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
- i. Ensure spinal stabilization/immobilization if indicated.
- j. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- k. Continually assess Level of Consciousness, ABCs
- l. Obtain appropriate (S-A-M-P-L-E) history related to event.

- m. Specific management principles should be directed towards patient's clinical status and suspected cause for their clinical condition.
- n. Envenomations: immobilize the extremity in a dependent position. May utilize cold packs and/or constricting bands, as indicated.
- o. Monitor and record vital signs.
- p. Prevent / treat shock.
- q. Initiate transport as soon as possible,
- r. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- s. Contact **MEDICAL CONTROL**
- t. Notify receiving hospital.

3.6.1 Carbon monoxide poisoning

Assessment/treatment priority

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Remove patient from site of exposure
- c. Use modified jaw thrust to open the airway if trauma is suspected.
- d. Be certain that the oropharynx is clear of secretions and/or vomitus.
- e. Put patient in recovery position if he/she is adequately breathing and continue oxygen administration via face mask or
- f. Provide patient with ventilations (BVM) with high flow oxygen if patient is exhibiting signs of respiratory compromise and if respiratory rate falls outside of normal limits (less than 10 or greater than 30 breaths per minute).
- g. If patient has no pulse start CPR according the CPR protocol
- h. Closely monitor the breathing pattern and VS
- i. If patient has low blood pressure (<90mm/Hg systolic) open IV line and give bolus 250-500cc of normal saline. Do not delay transportation if you have problem on securing IV line
- j. Contact medical control or receiving health facility for further management while transporting

3.6.2. Management of bites and stings

Spiders, snakes and scorpions

- a. Ice for comfort on spider or scorpion bite
- b. DO NOT apply ice to snake bites.

Bees and wasps

- a. Remove sting mechanism from honeybees only by scraping out. Do not squeeze venom sac if this remains on stinger.
- b. Provide wound care.
- c. Observe patient for signs of systemic allergic reaction.
- d. Treat anaphylaxis per Anaphylaxis/Allergic Reaction Protocol.

Drug, chemical, plant, mushroom ingestion

- a. Use protective eye equipment.
- b. In situations of potential ingestion or inhalation of petroleum distillates, do NOT induce vomiting.
- c. Use protective eye equipment

3.7. Allergic reactions/Anaphylaxis

Definition

Anaphylaxis is an acute, generalized, and violent antigen-antibody reaction that can be rapidly fatal. An Anaphylactic Reaction may present as a mild to severe response; and management is based upon severity.

Causes

There are multiple causes of anaphylaxis: most commonly these causes are injected substances or drugs such as: penicillin, cephalosporins, sulfonamides, iron, and thiamine. Other causes include food sensitivities, vaccines, contrast dyes, insect sting(s) and other environmental allergens. Most reactions occur within thirty minutes following allergen exposure, although the onset of symptoms can vary from several seconds to hours.

▪ **Assessment/ treatment priorities**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist ventilations as needed.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Continually assess level of consciousness, ABCs and Vital Signs.
- e. Obtain appropriate S-A-M-P-L-E history related to event.
- f. Determine if patient is in mild or severe distress:
 - . **Mild Distress:** itching, urticaria, nausea, and no respiratory distress.
 - . **Severe Distress:** stridor, bronchospasm, severe abdominal pain, respiratory distress, tachycardia, shock, and edema of lips, tongue or face.
- g. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- h. Initiate transport as soon as possible,
- i. Contact medical control/ receiving health facility about the patient condition and follow their instruction. If this is not possible and patient has signs of **sever distress** as defined in Assessment Priorities, and if patient age is between 5 and 65 years: administer
 - **Epinephrine** 0.15 or 0.3 mg IM a second dose may be given in 5 minutes if necessary
 - Open IV line with Large Bore and administer normal saline
 - **Diphenhydramine:** 25 mg- 50 mg IV push, IM.
 - **Albuterol** 2.5-3 mg. via nebulizer.
 - **Hydrocortisone** 100 mg. IV, IM,
Mild Distress:
 - **Diphenhydramine:** 25 mg- 50 mg IV push, IM

3.8. DIABETIC EMERGENCIES

The patient presenting with a potential diabetic emergency is either hypoglycemia or hyperglycemia in the pre-hospital environment may be difficult to assess without the capability of measuring a blood sugar. An alteration in mental/neurological status may be related or unrelated to their diabetes.

Hypoglycemia: Hypoglycemia (low blood sugar) is the most common type of diabetic emergency and may be life threatening.

Cause

Too much insulin or oral diabetic medication, reduced their food intake, or increased their level of physical activity acutely.

Typically, the **hypoglycemia** patient may present with a change in mental status, an appearance of intoxication, unsteady gait, slurred speech, unconscious, elevated heart rate, cold clammy skin, seizures, or coma

Hyperglycemia: Hyperglycemia (**overly high blood sugar**) although not as common as an emergency presentation, may still be life threatening to the patient.

Cause

Infections, stress, pain and not have taken enough or skipped an insulin dose,

Typically, the **hyperglycemic** patient may present with confusion, weakness, tachycardia, and hypotension.

▪ Assessment / Treatment Priorities

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Obtain blood glucose level(if glucometre is available)
- e. If glucose is less than 70 mg/dl and the patient is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated.
- f. **CAUTION:** Do NOT administer anything orally if the patient does not have a reasonable level of consciousness and normal gag reflex.
- g. If after 10 minutes the patient continues to be symptomatic, re-determine Blood Glucose level and administer a second dose of oral glucose if glucose is still below **70** mg/dl.
- h. If blood glucose level is >250mg/dl,give 250ml bolus normal saline and consult medical control
- i. **CAUTION:** If cerebrovascular accident is suspected, follow stroke protocols and notify Medical Control
- j. If patient is unconscious or seizing, transport on left side (coma position).
- k. Continually assess Level of Consciousness, ABCs and Vital Signs.
- l. If systolic blood pressure drops below 90mm Hg treat for shock.
- m. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15

- minutes if stable.
- n. Notify receiving hospital.
 - o. Initiate transport as soon as possible,
 - p. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

3.9. Environmental emergency

3.9.1. HYPERTHERMIA / HEAT EMERGENCIES

Heat emergencies result from one of two primary causes: environmental (exogenous heat load when the temperature exceeds 32° C or 90° F) or excessive exercise in moderate to extreme environmental conditions (endogenous heat load). Regardless of the cause, hyperthermic conditions can lead to the following conditions: Heat Cramps, Heat Exhaustion, or Heat Stroke.

Definition

Heat Cramps most commonly occur in the patient who exercises and sweats profusely and subsequently consumes water without adequate salt. Heat cramps most commonly involve the most heavily exercised muscles. These patients may present with normal temperature but hot sweaty skin with mild tachycardia and normal blood pressure.

Heat Exhaustion presents with minor mental status changes, dizziness, nausea, headache, tachycardia and mild hypotension. Temperature is less than 103° F. Rapid recovery generally follows cooling and saline administration.

Heat Stroke occurs when the patient's thermoregulatory mechanisms break down completely. Body temperature is elevated to extreme levels resulting in multi-system tissue damage, including altered mental status and physiological collapse. Heat stroke usually affects the elderly patient with underlying medical disorders. Patients with heat stroke usually have dry skin; however, up to 50% of patients with exertional heat stroke may exhibit persistent sweating. Therefore, the presence of sweating does not preclude the diagnosis.

▪ **Assessment / Treatment Priorities**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain an open airway and assist ventilations as needed.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.

- d. Continually assess Level of Consciousness, ABCs
- e. Obtain appropriate S-A-M-P-L-E history related to event.
- f. Monitor and record vital signs and ECG if available
- g. In general, rapid recognition of heat illness is required and rapid cooling of the patient is the priority.
- h. Loosen or remove all nonessential clothing. Move patient to a cool environment.
- i. For Heat Cramps and Heat exhaustion, administer water or oral re-hydration-electrolyte solution if patient is alert and swallows easily. Elevate legs of supine patient with heat exhaustion.
- j. If evidence of Heat Stroke,
- k. Initiate transport as soon as possible,
- l. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- m. **CAUTION:** Do not over-chill patient, observe for shivering. If shivering occurs, discontinue active cooling procedures.
 - Remove patient to cool area and place patient in a supine position.
 - Loosen or remove all unnecessary clothing, while protecting privacy.
 - Apply cool packs to armpits, neck and groin.
 - Use evaporation techniques if possible (fans, open windows)
 - Keep skin wet by applying water with wet towels or sponges
- n. Initiate transport as soon as possible
- q. Notify receiving hospital.
- r. If systolic blood pressure drops below 90mm Hg treat for shock.

3.9.2 HYPOTHERMIA / COLD EMERGENCIES

Cold Emergencies include conditions from mild frostbite to severe accidental hypothermia.

Definition

Frostbite is a localized injury resulting from freezing of body tissues and can be categorized from mild (frost-nip) to severe (deep frostbite).

Hypothermia is the result of a decrease in heat production (often seen in patients with metabolic, neurologic and infectious illnesses), increased heat loss (traumatic, environmental and toxic), or a combination of the two factors.

Hypothermia is defined as a core temperature below 95°F (35°C). Mild hypothermia often presents as altered mental status. Shivering may or may not be present. Moderate to severe

hypothermia will not only have altered mental status, but may show decreased pulse, respiratory rate and blood pressure. Failure to recognize and properly treat hypothermia can lead to significant morbidity and mortality.

REMEMBER: A patient in cardiopulmonary arrest with suspected severe hypothermia is not considered dead until all attempts at active re-warming have been completed in a hospital setting and resuscitation efforts remain unsuccessful.

ASSESSMENT / TREATMENT PRIORITIES

NOTE: Hypothermic patients must be handled gently as shaking movements may cause cardiac arrest.

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Continually assess Level of Consciousness, ABCs.
- e. Obtain appropriate S-A-M-P-L-E history related to event.
- f. Monitor and record vital signs and ECG if available
- g. Remove wet clothing (by cutting clothing to limit patient movement).
- h. Prevent heat loss with use of blankets. If available, place heat sources at patient's neck, armpits, flanks and groin.
- i. Handle patient gently. Do not allow patients to walk or exert themselves.
- j. Do not allow patient to eat or drink stimulants.
- k. Do not massage extremities.
- l. Initiate transport as soon as possible
- m. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) require
- n. If patient is in cardiopulmonary arrest, initiate CPR
- o. Use AED according to the standards if available
- p. Whenever possible, use warmed, humidified oxygen (40°C - 42°C) by non-re-breather mask, during resuscitation procedures for hypothermic patients.
- q. Contact MEDICAL CONTROL: Medical Control may order, further defibrillations with AED as patient rewarms.
- r. Initiate transport as soon as possible

- s. If systolic blood pressure drops below 90mm Hg, treat for shock.
- t. Notify receiving hospital.
- u. Administer warmed Normal Saline IV Solution (40°C - 42°C) whenever possible.
- v. Apply dry sterile dressings as padding over injured areas and splint as needed; **avoid pressure or constriction. Do not allow victim to use injured part(s).**
- w. Do not attempt rapid re-warming of the frozen part in out of hospital setting. Keep frozen part(s) from direct heat while warming the patient.

3.10. Abdominal pain/non traumatic

Definition:

Is a common symptom associated with transient disorders or serious disease. Many diseases can cause this symptom

Assessment/treatment priority

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain an open airway if necessary.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
- e. Obtain appropriate assessment, (O-P-Q-R-S-T), related to event.
- f. Obtain appropriate S-A-M-P-L-E history related to event, including: surgery, LMP, prior episodes.
- g. Allow the patient to assume a comfortable position, unless contraindicated. Flexion of the knees and hips may help reduce pain.
- h. Monitor and record vital signs
- i. Do not give anything Per mouth
- j. Prevent / treat for shock.
- k. Initiate transport as soon as possible,
- l. Notify receiving hospital.
- m. Consider pain management with consultation of receiving health institution
- n. If systolic blood pressure is less than 90mmHg, initiate IV normal saline 250 -500ml bolus IVs Normal Saline, en route to the health facility /hospital if possible, but **don't delay** evacuation/transportation of patients,

3.11. Acute febrile emergencies

Definition:

Acute Febrile illness AFI is used to refer to any illness that is associated with a sudden high fever causing an increase in temperature. For example malaria, meningitis, typhoid sepsis...

Cause

Bacterial, viral and protozoa, etc

High fever may be followed by delirium and convulsion

Assessment/Treatment priority

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Continually assess Level of Consciousness, ABCs.
- e. Obtain appropriate S-A-M-P-L-E history related to event.
- f. Monitor and record vital signs and ECG if available
- g. Remove excess clothing
- h. Keep the person in cold place
- i. Give sponge bath in lukewarm water
- j. Do not wrap the person in blanket /warm cloth
- k. If systolic blood pressure is less than 90mmHg, initiate IV normal saline 250 -500ml bolus IVs Normal Saline, en route to the health facility /hospital if possible
- l. Follow coma management protocol if the patient is in coma. (ABC, positioning)
- m. Urgent transportation

3.12. Behavioral emergency

Definition:

A situation in which a patient's behavior becomes so unusual, bizarre, threatening, or dangerous that it alarms the patient or family

Cause: Organic AFI, sepsis, alcohol

Non-organic unknown, psychiatric disorder

Sign and symptom: loud speech, hostile. Irritability, agitation, aggression to property

Confusion, expression of suicidal /homicidal thoughts,

Assessment/Treatment priorities

- a. Ensure scene safety and maintain appropriate body substance isolation precautions
- b. Maintain an open airway if necessary.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Remove patient from Stressful environment
- e. Restrain where indicated if threat to self or others with cotton padded bandage (do not use rope)
- f. Keep the patient the most appropriate position (do not restrict the patient breathing or circulation)
- g. Give diazepam 5-10 mg IM/IV push slowly with consultation of medical control or receiving health facility
- h. Transport patient as soon as possible,
- i. Constant reassessment of ABC's,
- j. Record all patient care information /pre-hospital care report

Criteria for Restraint Use:

- Patient out of control and may cause harm to self or others.
- Necessary force required for patient control without causing harm.
- Position of patient must not impede airway or breathing.
- Restraints must not impede circulation.
- Place mask on patient for body secretion protection. May use TB mask, or
- Non-rebreather if patient needs oxygen.
- Use supine or lateral positioning ONLY.
- DOCUMENT methods **used**

4. Trauma

4.1. General Assessment of Trauma Patient

4.1.1. Airway Management with C-Spine protection

The first priority is establishment or maintenance of airway patency.

- ✓ Talk to the patient

A patient who can speak clearly must have a clear airway. The unconscious patient may require airway and ventilatory assistance. Airway obstruction is most commonly due to obstruction by the tongue in the unconscious patient.

- ✓ Assess airway

The signs of airway obstruction may include:

- Snoring or gurgling
- Stridor or abnormal breath sounds
- Agitation which may indicate hypoxia
- Using the accessory muscles of ventilation/paradoxical chest movements
- Cyanosis (bluish discoloration of nails and lips).

- ✓ Be alert for foreign bodies.

- ✓ Open airway by

- Jaw thrust
- Insert oral airway or nasopharyngeal airway according to their level of consciousness

- ✓ Give oxygen (if available, via self-inflating bag or mask or nasal cannula)

- ✓ Apply C-Collar

4.1.2. Ventilation (Breathing) Management

The second priority is the establishment of adequate ventilation.

Inspection (LOOK) of respiratory rate is essential. Are any of the following present

- ✓ Cyanosis
- ✓ Penetrating injury
- ✓ Presence of flail chest
- ✓ Sucking chest wounds
- ✓ Use of accessory muscles?

Palpation (FEEL) for

- ✓ Tracheal shift
- ✓ Broken ribs
- ✓ Subcutaneous emphysema (air in the skin)

Auscultation (LISTEN) for

- ✓ Pneumothorax (decreased breath sounds on site of injury)
- ✓ Detection of abnormal sounds in the chest.

Resuscitation action

Special notes

- ✓ If available, maintain the patient on **oxygen** until complete stabilization is achieved.
- ✓ If patient is not breathing or breathing at a rate of less than 8 breathes per minute start bag mask ventilation.
- ✓ If a tension pneumothorax is suspected (respiratory distress, trachea deviated to one side, asymmetric chest, chest movement decreased on the injured side, tympanic on percussion, no air entry during auscultation and associated with hypotension) then one large-bore needle should be introduced into the pleural cavity through the second intercostal space, mid clavicular line to decompress the tension and allow time for the placement of an intercostal tube.

4.1.3. Circulatory Management

The third priority is establishment of adequate circulation.

- ‘Shock’ is defined as inadequate organ perfusion and tissue oxygenation. In the trauma patient it is most often due to hypovolaemia.
- The diagnosis of shock is based on clinical findings: hypotension, tachycardia, tachypnea, as well as hypothermia, pallor, cool extremities, decreased capillary refill, and decreased urine production.

Hemorrhagic (hypovolemic) shock:

- Occurs due to acute loss of blood or fluids. The amount of blood loss after trauma is often poorly assessed and in blunt trauma is usually underestimated.
- Remember large volumes of blood may be hidden in the abdominal and pleural cavity
 - Femoral shaft fracture may lose up to 2 liters of blood
 - Pelvic fracture often loses in excess of 2 liters of blood.

Hypovolaemia is a life-threatening emergency and must be recognized and treated aggressively

4.1.4. Primary Trauma Care Circulatory Resuscitation Measures

The goal is to restore oxygen delivery to the tissues. As the usual problem is loss of blood, fluid resuscitation must be a priority.

- a. If bleeding is external
 - Elevate extremity
 - Apply pressure by hand or apply pressure dressing.
 - If bleeding can not be stopped by the above measures apply tourniquet
- Adequate vascular access must be obtained. This requires the insertion of atleast two large-bore cannulas (14–16 G).
- Infusion fluids (normal saline and ringer lactate are fluids of choice)

DON'T GIVE (DNS, DW)

- Start fluid infusion (NS/RL) at a rate of 250-500ml over 20 minutes and consult medical oversight. If contact could not be established continue fluid resuscitation until systolic blood pressure of 90mmhg is achieved or signs of fluid overload appear.

History and Vital Signs

- ✓ Obtain pulse, respirations, blood pressure
- ✓ Blood glucose as necessary
- ✓ Gather history using SAMPLE
- ✓ S: Signs/Symptoms
- ✓ A: Allergies
- ✓ M: Medications (Over-the-counter, prescribed, vitamins, etc)
- ✓ L: Last Oral Intake
- ✓ E: Events Leading Up To Event/Injury

4.1.5. Rapid Trauma/Detailed/Focused Assessment (Should be done toe-to-head if possible)

This assessment should be done systematically, placing emphasis on the chief complaint, nature of

Illness or mechanism of injury presented. Any life-threatening injuries should be treated as found, if not done so in initial assessment. The standard DCAP-BTLS should be used in physical exam.

DCAP-BTLS

- ✓ D: Deformities
- ✓ C: Contusions
- ✓ A: Abrasions
- ✓ P: Punctures/Penetrations
- ✓ B: Burns
- ✓ T: Tenderness
- ✓ L: Lacerations
- ✓ S: Swelling

Head and Eyes

- ✓ Assess for DCAP-BTLS
- ✓ Check for Raccoon Eyes
- ✓ Check pupils for responsiveness, size and equality
- ✓ Check ears for Battle's Signs and cerebrospinal fluid or blood

Neck

- ✓ Assess for DCAP-BTLS
- ✓ Check for tracheal deviation
- ✓ Check for jugular vein distention (JVD)

Chest

- ✓ Assess for DCAP-BTLS
- ✓ Check for paradoxical motion
- ✓ Check for open chest wounds
- ✓ Auscultate lung sounds

Abdomen

- ✓ Assess for DCAP-BTLS
- ✓ Asses all four quadrants for rigidity and distention

Pelvis

- ✓ Assess for DCAP-BTLS
- ✓ Assess for stability
- ✓ Assess genitalia as needed

Upper/Lower Extremities

- ✓ Assess for DCAP-BTLS
- ✓ Check Circulatory, Motor, Sensation (CMS)

- ✓ Check range of motion, as necessary

Back

- ✓ Assess for DCAP-BTLS

4.1.6. Ongoing Assessment

A patient's airway, breathing, circulation, interventions/treatments and vitals should be checked regularly.

- ✓ Stable patients should have vitals taken every 15 minutes
- ✓ Unstable patients should have vitals taken every 5 minutes

Pain Management

- ✓ Give Diclofenac 75mg IM (intramuscular) or
- ✓ Give Tramadol 50mg IM /IV once

4.2. Specific types of traumatic emergencies

4.2.1. Head injuries

Head trauma can be:

- Superficial injury involving scalp, fascia, and skull,
- Internal injury involving brain and spinal cord, and
- Sensory organ injury involving the eye and the ear.
- Neck injury involves skeletal and soft tissue structures.
 - ❖ All these conditions must be considered when managing patients with head injury.

ASSESSMENT AND TREATMENT PRIORITIES

- Ensure scene safety and maintain appropriate body substance isolation precautions.
- Maintain an open airway (jaw thrust maneuver is recommended).
- Ensure cervical spine stabilization and immobilization
- **Breathing:** administer oxygen using appropriate delivery device, as needed.
- **Circulation:** determine patient's hemodynamic stability and symptoms, and act accordingly
- Continually assess, level of consciousness (AVPU), ABCs, disability and Vital Signs.

- Examine head for presence of lacerations, depressions, swelling, Nose bleeding, Cerebrospinal Fluid (CSF) from ears/nose, and foreign (impaled) objects.
- Obtain appropriate S-A-M-P-L-E history related to event, and mechanism of injury.

NOTE: Family and friends may be useful during the assessment to determine normal or abnormal mental status.

- Patient care activities must not unnecessarily delay transport to an appropriate facility.
- Prevent / treat shock, avoid hypoxia, determine blood glucose and act accordingly, avoid hyperthermia,
- Monitor and record vital signs
- Initiate transport as soon as possible,
- Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

BASIC PROCEDURES

- Ensure cervical spine stabilization and immobilization
- Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, pressure dressing, etc.).
- Activate ALS intercept, if available.
- Initiate transport as soon as possible
- Initiate 250-500ml IV Normal Saline/ Ringer lactate, if patient's systolic BLOOD PRESSURE drops below 90mm Hg and consult en route to the hospital. Don't use dextrose containing fluids.
- Notify receiving hospital.

4.2.2. EYE EMERGENCIES

- Eye emergencies can be either medical or traumatic. In general they are not life threatening.
- However, they present serious potential difficulties for the patient.
- Eye injuries can be caused by chemical or thermal burns, penetrating or blunt trauma, which can result in permanent disfigurement and/or blindness.

- In addition small foreign particles landing on the surface of the eye can also result in ocular emergencies

ASSESSMENT AND TREATMENT PRIORITIES

- Ensure **scene safety** and maintain appropriate **body substance isolation** precautions.
- If eye injury is the result of blunt and/or penetrating trauma, assume spinal injury and manage appropriately.
- If patient is unconscious maintain **open airway** and Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- Obtain appropriate S-A-M-P-L-E history related to incident, including any trauma (i.e. recent head trauma).
- Depending upon mechanism of injury, the following procedures should be followed:
 - **Chemical irritants:** Eye(s) should be opened and flushed as soon as possible using copious amounts of water for a period of fifteen (15) minutes with a controlled stream of Sterile Normal Saline, Sterile water or tap water.
 - **Blunt Trauma:** Both eyes should be patched and protected.
 - **Penetrating Trauma:** Puncture wound with no impaled object: Both eyes should be patched and protected.
 - **NOTE:** If object is impaled in the eye, the object must be immobilized and both eyes should be patched and protected. (Objects penetrating the eye globe should only be removed in-hospital.)
 - **Thermal Burns:** wash eye with tap water/normal saline and both eyes should be patched and protected.
 - **Lacerations:** If there is a laceration of the globe itself, apply no pressure to the eye because compression can interfere with the blood supply to the back of the eye and result in loss of vision from damage to the retina.
 - The followings are the Guidelines in treating lacerations of the eye:
 - a. Never exert pressure on or manipulate the injured eye (globe).
 - b. If part of the eyeball is exposed, gently apply a moist, sterile dressing to prevent drying.
 - c. Cover the injured eye with a protective eye shield.
- **Treatment of a displaced globe**
 - a. Do not attempt to reposition the globe.

- b. Simply cover the eye and stabilize it with a moist, sterile dressing.
 - c. Have the patient lie in a supine position while on the way to the hospital.
- If patient is unable to close eyelids, moisten eyes with sterile Normal Saline (exception: chemical irritants which need continuous irrigation) to maintain eye integrity. The eye(s) may then be irrigated and covered with moistened gauze pads.
 - Obtain visual history, including use of contact lenses, corrective lenses (glass/plastic), safety goggles.
 - **NOTE:** As a general rule, EMTs should not attempt to remove contact lenses of patients with eye injuries. However, in certain chemical burn cases, **MEDICAL CONTROL** may instruct in removal of the lenses, if patient is unable to do so.
 - Monitor and record vital signs as indicated
 - Initiate transport as soon as possible
 - Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

GUIDELINES FOR SECURING IMPALED OBJECT IN AN EYE

1. Place a roll of gauze bandage or folded gauze pads on either side of the impaled object, along the vertical axis of the head. These rolls or pads should be placed so they stabilize the object.
2. Fit a paper or other protective cup/cone etc. over the impaled object. The protective cup should not touch the impaled object and it must rest upon the rolls of gauze or gauze pads.
3. Secure the dressings and cup in place with self-adherent roller bandage or wrapping of gauze. **DO NOT** secure bandage over the top of the cup.
4. Patch and bandage the uninjured eye to reduce eye movements.

GUIDELINES FOR REMOVAL OF CONTACT LENSES

Removal of soft contact lenses

1. Pull down the lower eyelid.
2. Gently slide the lens down onto the conjunctiva.
3. Compress the lens between the thumb and index finger using a pinching motion.
4. Remove the lens.

5. Store lens in a container with water or normal saline and label appropriately (i.e., left/right eye and patient's name).

4.2.3 EAR INJURIES

- The injury to external ear is common and the extent is from laceration to mutilation of the ear part.
- The entry of foreign body to the canal is other common problem in case of children.

Assessment and treatment priorities

1. Place a soft, padded dressing between the ear and the sculp.
2. If the part of the external ear removed, keep the part in wet sterile material and send to hospital with patient.
3. Don't attempt to remove foreign body from the ear canal it may cause further trauma. Let this task to advance emergency care provider.
4. Note any clear fluid coming through ear.

4.2.4. NOSE INJURY

Assessment and treatment priorities for nasal bleeding

1. Position the victim in sitting, leaning forward,
2. Apply direct pressure by pinching the fleshy part of the nostril for about 10-15 minute
3. Keep the patient calm and quite
4. Apply covered ice over the nose
5. Control bleeding from laceration and abrasion from surrounding structure with sterile dressing

4.2.5 Face and Throat Injury

- The soft tissue injury and fractures are common as well as serious in its severity to the extent of death and disability
- It may cause facial disfiguration if not properly managed, sever bleeding it may lead to shock and hematoma; it may also block blood supply to the brain.

Assessment and treatment priorities

- ✓ Immobilize the head in neutral position
- ✓ Maintain an **open airway**, (use jaw-thrust maneuver), Clear any blood or vomitus from the mouth using gauze with your gloved hand.
- ✓ Monitor circulation,control bleeding by covering any wound or site of bleeding with dry sterile dress
- ✓ Use roller gauze, wrapped around the head to hold dressing in place, in case of bone fracture don't apply excessive pressure
- ✓ When the injury involves brain and the eye cover with moist sterile dressing.
- ✓ For soft tissue around the mouth you should check for bleeding inside the mouth, broken teeth and laceration of the tongue
- ✓ Advice thepatient not to swallow any blood this may induce further vomiting.
- ✓ Check any source of bleeding in oral cavity. Have suction ready to use.
- ✓ If you found the separated tissue it should be delivered to hospital with moist sterile dressing, so may repair by skilled personnel.

4.2.6. Injuries to the neck

- ✓ Blunt injury to neck may involve the trachea, larynx that likely present disability to voice and fatal airway obstruction
- ✓ Penetrating injury to the neck likely to cause damage to underline carotid arteries/jugular veins these further allows entry of air into veins cause pulmonary embolism and sever state of bleeding.

Assessment and treatment priorities

- **To control the source of external bleeding follow the following steps**

1. Apply direct pressure to the bleeding site with sterile occlusive dressing, if not with available cloth
2. Secure the dressing in place with roller gauze; add more dress over the past dress if needed.
3. Wrap the gauze around the neck and under the patients shoulder.
4. Don't wrap the gauze around the neck to avoid possible airway and circulatory problem.
5. Document the time, and VS; communicate medical control, or receiving facility for farther advice

6. If bleeding is heavy and BP is going down, secure IV line and start bolus fluid.
Do not delay transportation
7. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

4.2.7. SPINAL INJURIES

Spinal cord injury may be the result of direct blunt and/or penetrating trauma, compression forces abnormal motion (hyper-flexion, hyperextension, hyper-rotation, lateral bending and distraction, i.e., hanging).

Most spinal injuries result from motor vehicle crashes, falls, firearms, and recreational activities. Spinal injuries may be classified into sprains, strains, fractures, dislocations and/or actual cord injuries.

Spinal cord injuries are classified as complete or incomplete and may be the result of pressure, contusion or laceration of the cord.

When evaluating for possible spinal injury and the need for immobilization, consider the following factors as high-risk:

- Altered mental status due to injury, intoxication, or other causes;
- History of cervical spine injury or abnormality;
- Evidence of significant non-penetrating trauma above the clavicles;
- Posterior neck pain;
- Loss of sensation in extremities;
- Weakness or paralysis of extremities;
- Distracting injury (such as long-bone fracture);
- Age less than 8 years or over 65 years;

Mechanism of injury

- ❖ fall from over 3 feet and/or 5+ stair steps
- ❖ Motor Vehicle Crash at 30+ mph, or rollover or ejection
- ❖ Motorcycle, bicycle, or pedestrian-vehicle collision
- ❖ Diving or axial load
- ❖ Electric shock

▪ ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.

- b. Maintain an open airway using spinal precautions as needed
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated
- d. Assume spinal injury and provide spinal immobilize accordingly.
- e. Determine patient's hemodynamic stability and symptoms
- f. Continually assess Level of Consciousness (AVPU), ABCs, disability and Vital Signs.
- g. Examine head for presence of lacerations depressions, swelling, battles sign cerebrospinal fluid (CSF) from ears/nose and foreign (impaled) objects.
- h. Obtain appropriate S-A-M-P-L-E history related to event, including mechanism of injury.
- i. NOTE: Family and friends may be useful during the assessment to determine normal or abnormal mental status.
- j. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
- k. Initiate transport as soon as possible,
- l. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- m. Monitor and record vital signs.

BASIC PROCEDURES

1. Control/stop any identified life-threatening hemorrhage (direct pressure, pressure points, etc.).
2. Determine presence or absence of significant neurologic signs and symptoms: motor function, sensory function, reflex responses, visual inspection, bradycardia, and hypotension, loss of sweating or shivering and loss of bladder/bowel control.
3. Secure IV line and give 250- 500ml of Normal Saline or Ringer Lactate bolus if systolic blood pressure is less than 90mmhg then consult for more fluid administration. Do not use dextrose containing fluid
4. Notify receiving hospital of patient's status.

SPINAL STABILIZATION / IMMOBILIZATION SUMMARY

General principles:

- Provide manual in-line immobilization.
 - A. If Patient is in sitting or standing position
 1. Access from behind

- Place heels on mastoid & digits on mandible
- 2. Access from the front:
 - place heels on mandibule& digits on mastoïde
- 3. Access from the side:
 - One hand on occiput &the other under mandible
- B. If patient is in Supine
 - Thumbs on clavicles, palms below shoulders
- C. If Patient found prone/on the side:
 - Position your hands comfortably
- D. Examine the patient's neck and apply cervical collar.
- E. Make sure collar does not limit jaw movement
- F. Do not release manual control until the patient is fully secured in long back board
- G. Immobilize the patient's torso to the selected immobilization device such that the torso cannot move up, down, left or right.
- H. Evaluate torso straps and adjust as needed.
- I. Place an appropriate amount of padding behind head and/or neck and small of back, if needed for adult patients and under the thorax and/or neck for pediatric patients (age 7 yrs. or under) to maintain in-line spinal immobilization.
- J. Log roll the patient to assess the back
- K. Immobilize the patient's head.
- L. Once patient is immobilized, secure patient's arms and legs to the board or immobilization device.
- M. Reevaluate patient's responsiveness, ABCs, need for immediate resuscitation and check motor, sensory and distal pulses in all four extremities.

4.2.8. THORACIC TRAUMA

Chest injuries are the result of blunt trauma, penetrating trauma or both and most commonly result from motor vehicle crashes, blast injuries, falls from heights, blows to the chest, chest compression, gunshot and stab wounds.

Chest injuries include:

1. Trauma of the rib cage
2. Injury of the lung,
3. Injury of the heart,

4. Injury of great vessels and/or diaphragm.

A number of potentially lethal injuries can occur with significant chest trauma. These include:

- Flail chest,
- Hemothorax,
- Pneumothorax,
- Tension pneumothorax,
- Myocardial contusion,
- Sucking chest wound,
- Cardiac tamponade,
- Aortic rupture and/or
- Diaphragmatic rupture.

In general these patients are managed under the multisystem trauma protocol in most circumstances. However, specific interventions may be life saving for the conditions noted above.

▪ **ASSESSMENT / TREATMENT PRIORITIES**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Make sure the airway is patent and patient breathing is adequate. If not open airway using only jaw thrust, suck any secretions and apply appropriate airway device to the level of consciousness
- c. Assume spinal injury and take all precautions for spinal injury
- d. Look and listen breathing activities: RR, Symmetric bilateral chest movement, absence and /or presence of use of accessory muscles, deviation of trachea, engorgement of neck veins,
- e. Administer oxygen using appropriate oxygen delivery device, as indicated.
- f. Determine patient's hemodynamic stability and symptoms.
- g. Continually assess Level of Consciousness, ABCs and Vital Signs.
- h. Treat all life threatening conditions (tension pneumothorax, open pneumothorax, flail chest, hemothorax) as they become identified.
- i. Secure IV line and give 250- 500ml of Normal Saline or Ringer Lactate if systolic blood pressure is less than 90mmhg then consult for more fluid administration. Do not use dextrose containing fluid

- j. Obtain appropriate S-A-M-P-L-E history related to event.
- k. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
- l. Monitor and record vital signs
- m. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- n. Treat pain with tramadol 50mg, IM, OR IV
- o. Initiate transport as soon as possible,
- p. Notify receiving health facility

BASIC PROCEDURES

1. Provide appropriate management for identified thoracic injuries:

a. Open pneumothorax:

- Immediately apply an occlusive dressing sealing 3 sides.
- Monitor patient closely for evidence of developing tension pneumothorax

b. If object is protruding from chest

- Do not attempt to remove it.
- Immobilize object by placing dressings around it and taping the dressings in position
 - Place victim in comfortable position
 - Give high flow oxygen
 - Transport immediately

b. **Tension pneumothorax:**

➤ **Patient presentation**

- Increasing respiratory difficulty,
- Distended neck veins,
- Unilateral decreased breath sounds,
- Tracheal deviation away from the side of injured side
- absent breath sounds on the injured side

➤ **Treatment**

- ✓ If Tension pneumothorax present following closure of open pneumothorax, release occlusive dressing temporarily, then reseal.
- ✓ Contact medical control/receiving health institution for pleural/ tension

pneumothorax decompression if indicated

- ✓ Perform needle chest decompression, at mid clavicle on the above margin of 2nd rib,
- ✓ Observe coming out of air, it is a positive sign of tension pneumothorax.

c. Flail chest- (paradoxical movement of portion of chest wall)

- Provide manual stabilization of the flail segment; or splint as needed
- Position patient with injured side down, unless contraindicated.
- **Note:** assisted positive ventilation using bag valve mask device may be indicated and may also serve as internal splinting of the flail segment due to lung expansion
- Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
- Secure IV line and give 250- 500ml of Normal Saline or Ringer Lactate if systolic blood pressure is less than 90mmhg then consult for more fluid administration. Do not use dextrose containing fluid
- Treat pain with tramadol 50mg IV, or IM
- Notify receiving hospital.

4.2.9 TRAUMATIC CARDIOPULMONARY ARREST (and POST-RESUSCITATION CARE)

Cardiopulmonary arrest due to trauma, especially penetrating trauma, may occasionally be reversible with prompt aggressive therapy.

Patients found in arrest, without any signs of life (i.e. no pulse), by first-arriving EMS personnel have little probability of survival. Therefore, resuscitation of these patients should be considered only in situations where witnessed signs of life shortly before.

EMS arrival were noted or in exceptional circumstances (penetrating chest trauma, hypothermia, etc.). Management of the few potentially salvageable patients will require rapid assessment, stabilization and transportation.

▪ **ASSESSMENT / TREATMENT PRIORITIES**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Determine unresponsiveness, absence of breathing
- c. Initiate cardiopulmonary resuscitation (CPR) for 2 minutes (5 cycles), then reassess for ABC.

- d. Consider all potential non-traumatic causes (hypothermia, overdose, underlying medical conditions etc.).
- e. Maintain an open airway and ventilate the patient. Assume spinal injury and treat accordingly.
- f. Administer oxygen using appropriate oxygen delivery device, as indicated.
- g. Continually assess Level of Consciousness using AVPU, ABCs and Vital Signs.
- h. Obtain appropriate S-A-M-P-L-E history related to event.
- i. Secure IV line and give 250- 500ml of Normal Saline or Ringer Lactate bolus if systolic blood pressure is less than 90mmhg then consult your medical control for more fluid administration
- j. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility.
- k. Monitor and record vital signs and ECG if available
- l. Initiate transport as soon as possible, notify receiving health facility

4.2.10. ABDOMINAL and PELVIC TRAUMA

Abdominal and pelvic injuries can result from blunt or penetrating trauma, and most commonly result from motor vehicle crashes, blast injuries, falls from heights, blows to the abdomen, abdominal compression, and gunshot and stab wounds. Injuries include musculo-skeletal and internal organs. These injuries can be associated with rib, vertebral and pelvic fracture.

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway. Assume spinal injury when appropriate apply spinal immobilization procedure.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Control any life threatening hemorrhage
- e. Secure IV line and give 250- 500ml of Normal Saline or Ringer Lactate if systolic blood pressure is less than 90mmhg with 10-15 minutes , check B/P and pulse, consult your medical control or receiving health facility for further

management . Do not use dextrose containing fluids

- f. Treat pain with tramadol 50mg IV/IM
- g. Continually assess Level of Consciousness, ABCs and Vital Signs.
- h. Obtain appropriate S-A-M-P-L-E history related to event.
- i. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
- j. Initiate transport as soon as possible, do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

Eviscerations of internal organs

- Remove any organic mater
- Cover eviscerations with sterile non-adherent material (saline or sterile water moistened).
- If applicable, stabilize any impaled object(s).
- Stabilize the pelvis with available sheet
- Initiate transport as soon as possible
- Notify receiving hospital.

NOTE: Special Consideration: the pregnant patient

Pregnant victims involved in major trauma to the abdomen are more susceptible to life-threatening injuries. In general, the fluid-filled gravid uterus protects the fetus from blunt trauma. However, direct trauma may result in premature separation of the placenta from the uterine wall, premature labor, uterine rupture, abortion and fetal death. Therefore, immediate transport to the appropriate emergency facility is of highest priority.

Abdominal trauma during pregnancy:

- Follow all procedures identified above.
- Place patient in left lateral recumbent position (non-spinal injured patient).
- If suspected spinal injury: completely immobilize the patient on a long board and place the patient on her left side (while immobilized).
- Notify appropriate facility immediately.

4.2.11. Genitourinary injuries

When there is an injury to kidneys and bladder:

- ✓ Scene safety and Body Substance Isolation
- ✓ Check ABC

- ✓ Treat for shock, if there is signs of shock
- ✓ Monitor v/s
- ✓ Provide prompt transport to hospital.

Injuries of the External male genitalia

- ✓ This type of injuries characterized with pain & great concern for the patient.
- ✓ Wrap the penis in a soft, sterile dressing moistened with sterile saline solution
- ✓ Use direct pressure to control any bleeding
- ✓ Try to save and preserve the avulsed skin with rapid transport for treatment
- ✓ Amputation of the penile shaft/partial or complete/
 - Apply local pressure with sterile dressing on the remaining stump.
 - Never apply a constricting device to the penis to control bleeding
 - Wrap the amputated part with moist sterile dressing, place it in a plastic bag, and transport it in cooled container.

Direct blow on the scrotum–

- ✓ Can result in the rupture of testicle or accumulation of blood around the testes.
 - Apply cold pack to the area

N.B: General rules for the management of injuries of male genitalia

- ✓ The injuries are very painful make the patient comfortable as much as possible.
- ✓ Use sterile moist compresses to cover areas that have been stripped of skin
- ✓ Apply direct pressure with dry sterile dressing to control bleeding
- ✓

External Female Genitalia

- ✓ An injury of the external female genitalia includes all types of soft tissue injuries, which are very painful.
- ✓ Laceration, Abrasion, and Avulsions should be treated with moist, sterile compresses, apply local pressure to control bleeding and use diaper-type bandage to hold the dressing in place
- ✓ Don't pack the vagina
- ✓ Determine urgency of transport.

4.2.12. MUSCULOSKELETAL INJURIES

Musculoskeletal injuries can occur from both blunt and penetrating trauma. Injuries may include contusions, cramps, dislocations, fractures, spasm, sprains, and strains. Early proper

treatment of these injuries may prevent long-term morbidity and disability. Major injuries to the musculoskeletal system (e.g., pelvic fractures and hip dislocations) may cause shock due to hemorrhage, injury to adjacent nerves and blood vessels and infection due to the presence of an open fracture. Fractures of the humerus, pelvis or femur take priority over other musculoskeletal injuries, as do fractures or dislocations involving circulatory or neurologic deficits.

▪ **ASSESSMENT / TREATMENT PRIORITIES**

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway. Assume spinal injury when appropriate and immobilize it
- c. Administer oxygen using appropriate oxygen delivery device, indicated.
- d. Stop any external bleeding
- e. Determine patient's hemodynamic stability and symptoms.
- f. Continually assess level of consciousness, ABCs and Vital Signs.
- g. Assess the neurovascular status (motor, sensory and circulation) distal to the injury before and after proper immobilization.
- h. If no palpable, distal pulse is present, apply gentle traction along the axis of the extremity distal to the injury until the distal pulse is palpable and immobilize in place. **Note:** This does not apply to dislocations.
- i. All jewelry should be removed from an injured extremity.
- j. Immobilize all painful, swollen and/or deformed extremity injuries (e.g. fractures, sprains, strains and/or dislocations) involving joints, in the position found.
- k. Obtain appropriate S-A-M-P-L-E history related to event.
- l. Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate and manage appropriately
- m. Prevent / treat for shock.
- n. Monitor and record vital signs.
- o. Initiate transport as soon as possible,
- p. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- q. Notify receiving hospital.

4.2.13. TRAUMATIC AMPUTATIONS

The partial or complete separation of a digit or limb is most commonly the result of an industrial/machine operation accident.

The re-implantation surgical team may utilize the amputated part, or the skin of the amputated part. Careful management of the patient and their amputated part(s) will reduce the possibility of infection and increase the likelihood of successful re-implantation.

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway. Assume spinal injury when appropriate immobilize it
- c. Administer oxygen using appropriate oxygen delivery device, as indicated.
- d. Determine patient's hemodynamic stability and symptoms, using O-P-Q-R-S-T model.
- e. Continually assess Level of Consciousness, ABCs and Vital Signs.
- f. Treat all life threatening conditions as they become identified.
- g. Obtain appropriate S-A-M-P-L-E history related to event. Assess and treat pain.
- h. Patient transport must not be unnecessarily delayed in an effort to find avulsed tissue and/or body parts, if they are not readily available. Other EMS/law enforcement providers may transport these tissues and/or body parts to the receiving facility at a later time.
- i. Monitor and record vital signs
- j. Initiate transport as soon as possible,
- k. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- l.

BASIC PROCEDURES

1. Control/stop any identified life threatening hemorrhages. If other methods cannot stop the bleeding apply an appropriate tourniquet. Document the exact time of tourniquet application.
2. **Management of injured tissue:**
 - a. **Tissue still attached to body:**
 - Clean wound surface with sterile water or Normal Saline.
 - Gently return skin to normal position if possible.

- Control bleeding and bandage wound with bulky pressure dressings.

b. Complete amputation:

- Clean wound surface with sterile water or Normal Saline.
 - Control bleeding and bandage wound
 - Retrieve amputated tissue/part(s) if possible.
 - Wrap amputated tissue/part(s) in sterile gauze moistened with sterile water or Normal Saline.
 - Place amputated tissue/part(s) in a plastic bag.
 - Place sealed bag into a cool/cold water immersion. **NOTE:** ice cubes may be in the outer bag of water but no direct contact between injured tissue/part(s) and ice should occur.
1. Secure IV line and give 250- 500ml of Normal Saline or Ringer Lactate, if systolic blood pressure is less than 90mmhg then consult for further management .
 4. Transport immediately.
 5. Notify receiving hospital.

4.2.14. SOFT TISSUE / CRUSH INJURIES

Trauma to the skin may include abrasions, lacerations, hematomas, punctures, avulsions, contusions, incisions, and amputations, crush injuries and compartment syndromes.

Crush injury is associated with severe trauma and most commonly occur in multiple casualty disasters, such as bombings, earthquakes, building collapse, train accidents and mining accidents. Crush injuries may result in fatal injury or severe metabolic abnormalities that may result in death. Careful monitoring of these patients is essential.

Compartment syndrome is usually due to a crush injury and is a surgical emergency. It occurs most commonly in the forearm and leg, gluteal region, thigh, and lumbar paraspinal muscles. Compartment syndrome may result in ischemic swelling, muscle infarction, nerve injury and permanent loss of extremity function.

▪ **ASSESSMENT / TREATMENT PRIORITIES**

- a. Ensure scene safety, including safety for the patient(s) and rescuer(s), if indicated.
- b. Maintain appropriate body substance isolation precautions.
- c. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.

- d. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- e. Continually assess Level of Consciousness, ABCs and Vital Signs.
- f. Treat all life threatening conditions as they become identified.
- g. Assess the function of the injured area above and below the injury site:
 - Check pulses,
 - Sensation,
 - Motor function distal to the injury.
 - Splint/immobilize injured areas as indicated.
 - Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate.
 - h. Treat for shock.
 - i. Treat pain with tramadol 50mg IV/IM
 - j. Obtain appropriate S-A-M-P-L-E history related to event.
 - k. Monitor and record vital signs and ECG.
 - l. Initiate transport as soon as possible,

BASIC PROCEDURES

1. Control/stop any identified life threatening hemorrhages.
2. Place dry sterile dressing on all open wounds and bandage as needed:
 - If wound is grossly contaminated, irrigate with sterile water or normal saline.
 - Stabilize all protruding foreign bodies (impaled objects) if noted
3. If you suspect severe crushing injury/compartment syndrome, if injury permits:
 - Remove all restrictive dressings
 - Close monitoring of distal pulse, sensation, and motor function
 - Splint/immobilize injured areas as indicated.
 - Activate ALS intercept, if deemed necessary and if available.
 - Initiate transport as soon as possible
 - Notify receiving hospital.

4.2.15. BURNS / INHALATION INJURIES

- A burn injury is caused by an interaction between energy (thermal, chemical, electrical, or radiation) and biological matter.

- Thermal burns (flames, scolds, contact with hot substances or objects, including steam) account for the majority of burns.
- Acids, alkalis, cause chemical burns and organic compounds (phenols, creosote, and petroleum products) commonly found in industrial and household environments.
- Burn severity should be assessed and classified by degree.
 - The **first-degree** burn involves only the upper layers of the epidermis and dermis.
 - The **second-degree** burn penetrates slightly deeper and produces blistering of the skin. First- and second- degree burns are considered **partial thickness** burns.
 - **Third degree** or **full thickness** burns penetrate the entire dermis. These burns may involve injury to blood vessels, nerves, muscle tissue, bone, or internal organs. Burn surface area should be assessed by the rule of nines.

Inhalation injury and fire toxicology

- (Carbon Monoxide, Hydrogen Chloride, Phosgene, Nitrogen Dioxide, Ammonia, Cyanide, Sulfur Dioxide, Methane, and/or Argon) frequently accompany burn injuries.
- This is especially true if injury occurred in a closed space and/or patient presents with facial burns, singed nasal hairs, beard or mustache, sooty or bloody sputum, difficulty breathing, or brassy cough.
- The signs and symptoms of inhalation injuries may not be noted until several hours after inhalation.

1. MAJOR BURN

- 25% of BSA or greater
- Functionally significant involvement of hands, face, feet, or perineum
- Electrical or Inhalation Injury
- Concomitant Injury or severe pre-existing medical problems

2. MODERATE BURN

- 5-25% BSA
- No complications or involvement of hands, face, feet, or perineum
- No electrical injury, inhalation injury, concomitant injury

- No severe pre-existing medical problem

3. **MINOR BURN**

- 5% or less BSA
- No involvement of hands, face, feet, or perineum
- No electrical burns, inhalation injury, severe pre-existing medical problem or complications

ASSESSMENT / TREATMENT PRIORITIES

- Ensure **scene safety**, including safety for the patient(s) and rescuer(s).
- Call** appropriate public safety agencies for assistance if needed.
- Take appropriate **personal protective** measures against airborne dust or toxic fumes and any other potential chemical agents.
- Maintain appropriate body substance isolation precautions.
- Maintain open **airway** and assist **ventilations** as needed.
- Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
- Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- Early endotracheal intubation must be considered for all patients with suspected inhalation injuries and/or who present in respiratory distress. Transport immediately to appropriate health facility
- Determine patient's hemodynamic stability and symptoms. Continually assess, level of consciousness, ABCs and Vital Signs.
- Treat all life threatening conditions as they become identified.
- Obtain appropriate S-A-M-P-L-E history related to event (determine mechanism and time of exposure, assess patient for evidence of inhalation injury including potential for toxic inhalation exposure).
- Monitor and record vital signs and ECG if available
- Initiate transport as soon as possible, with or without ALS.
- Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

BASIC PROCEDURES

- Appropriately manage

1. **THERMAL**

- Stop burning process with water or saline for up to 10 minutes.

- Remove smoldering, non-adherent clothing and jewelry.
- DO NOT pull off skin or tissue.
- Cover burns with a CLEAN, DRY DRESSING

2. CHEMICAL

- Determine offending agent(s) if possible. Consider HAZMAT intervention if indicated.
- Wash with copious amounts of clean water and/or sterile normal saline for 10-15 minutes, unless contraindicated by chemical agent (i.e., Sodium, Potassium and/or Lithium metals).
- **CAUTION:** Dry Lime/Lye and/or Phenol exposure: water irrigation is not recommended as primary treatment since water exposure may produce further chemical reactions. Dry powders should be brushed off prior to flushing with large amounts of water. It is advised to contact MEDICAL CONTROL for further advice.
- Initiate transport as soon as possible with or without ALS.
- Notify receiving hospital.

INTERMEDIATE PROCEDURES

- Initiate large bore IV Normal Saline. Begin fluid resuscitation for treatment of the BURN INJURY if greater than 20% BSA
- For transport times LESS THAN 1 HOUR use the following pre-hospital rates:
 - Over 15 yrs. of age – 500mL/hour
 - 5 –15 yrs. of age – 250mL/hour
 - 2 – 5 yrs. of age – 125mL/hour
 - Under 2 yrs. of age – 100mL/hour
- For transport times GREATER THAN 1 HOUR consult medical control regarding the following fluid rates:
 - Adults: 2-4 mL x kg x % burn [Adult = over 15 yrs. of age
 - Pediatric: 3-4 mL x kg x % burn
- Infusion rate regulated so one-half of estimated volume is given in the first 8 hours post burn
- If suspected hypovolemia (consider other injuries), administer 250mL - 500mL fluid bolus and titrate to patient's hemodynamic status.

5. ELECTROCUTION / LIGHTNING INJURIES

The manifestations and severity of electrical trauma encompass a wide spectrum, ranging from a transient unpleasant sensation due to brief contact with low-intensity household current to instantaneous death and massive injury from high-voltage electrocution/lightning injury.

Unlike thermal burns, electrical injuries commonly involve multiple body systems with the potential to pose difficult challenges regarding accurate assessment and proper management.

Injury due to electricity may include burns to the skin and deeper tissues, cardiac rhythm disturbances and associated injuries from falls and other trauma. The amperage, voltage, type of current (AC vs. DC) duration of contact, tissue resistance and current pathway through the body will determine the type and extent of injury. Higher voltage, greater current, longer contact and flow through the heart are associated with worse injury and worse outcome.

▪ ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety, i.e. by ascertaining that the source of electricity is removed from the patient and the rescue area.
- b. Call appropriate public safety agencies for assistance if needed.
- c. Maintain appropriate body substance isolation precautions.
- d. Maintain open airway and assist ventilations as needed.
- e. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
- f. Maintain an open airway with appropriate device(s); remove secretions, vomitus, initiate CPR.
- g. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- h. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
- i. Obtain appropriate S-A-M-P-L-E history related to event, (voltage source, and time of contact, path of flow through body and unresponsiveness or seizures).
- j. Assess patient for entry and exit wounds, particularly under rings or other metal objects.

- k. Monitor and record vital signs and ECG if available
- l. Prevent / treat for shock.
- m. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

BASIC PROCEDURES

1. If patient is in cardiopulmonary arrest:
 - a. Initiate CPR with supplemental oxygen.
2. Activate ALS intercept, if available.
3. Initiate transport as soon as possible
4. Manage burn injuries and/or entrance and exit wounds as indicated.
5. If patient's BLOOD PRESSURE drops below 90mm Hg systolic: treat for shock.
6. Notify receiving hospital.

INTERMEDIATE PROCEDURES

1. STANDING ORDERS

- a. Initiate large bore IV Normal Saline.
- b. Begin fluid resuscitation for treatment of the BURN INJURY if greater than 20% BSA
- c. For transport times less than 1hr use the following pre hospital rates
 - Over 15 yrs. of age – 500mL/hour
 - 5 –15 yrs. of age – 250mL/hour
 - 2 – 5 yrs. of age – 125mL/hour
 - Under 2 yrs. of age – 100mL/hour
- d. For transport times GREATER THAN 1 HOUR consult medical control regarding the following fluid rates:
 - Adults: 2-4 mL x kg x % burn [Adult = over 15 yrs. of age]
 - Pediatric: 3-4 mL x kg x % burn
- e. Infusion rate regulated so one-half of estimated volume is given in the first 8 hours post burn

5.1 MULTI-SYSTEM TRAUMA

Multi-system trauma is a leading cause of death and disability. Trauma victims require definitive surgical intervention to repair and/or stabilize their injuries in order to enhance survival and reduce complications. Successful management of trauma victims will require

rapid assessment, stabilization and transportation to hospital.

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway . Ensure cervical spine stabilization and immobilization, when appropriate and treat accordingly.
- c. Administer oxygen using appropriate oxygen delivery device, as indicated.
- d. Continually assess Level of Consciousness, ABCs and Vital Signs.
- e. Treat all life threatening conditions as they become identified.
- f. Obtain appropriate S-A-M-P-L-E history related to event.
- g. Treat for shock. Secure IV line and give 250- 500ml of Normal Saline or Ringer Lactate bolus if systolic blood pressure is less than 90mmhg then consult for more fluid administration. Do not use dextrose containing fluid
- h. Initiate transport as soon as possible,
- i. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- j. Notify receiving hospital

5.2. DROWNING AND NEAR-DROWNING EMERGENCIES

Drowning begins with accidental or intentional submersion in any liquid. Fresh-water drowning/near-drowning and salt-water drowning/near-drowning have different physiologic mechanisms leading to asphyxia. However, out of hospital management of these patients is the same: treatment must be directed toward correcting severe hypoxia.

SPECIAL CONSIDERATIONS:

- a. The **cold-water** drowning/near-drowning victim
 - The first thing to remember is that hypothermia can make it very difficult to find the pulse of a near-drowning survivor. Therefore, a careful search for pulse should be done, for at least a minute, before trying to restart the heart by chest compressions.
 - The Heimlich or other maneuvers aimed at draining water from the body are of little use; it is much more important to try to get the victim breathing immediately instead
 - It is also vital to begin to bring the victim's body temperature back up to normal levels, using whatever means is at hand, from blankets to heaters or hot packs.
 - Should be not considered dead until he/she is warm and dead, unless the patient has

- been submerged for a prolonged period (typically greater than one (1) hour).
- Near-drowning victims may exhibit delayed pulmonary complications up to 24-36 hours after the submersion incident. This is especially true concerning salt-water exposure, therefore all such patients has to be transported to health facility for observation
- b. All drowning/near-drowning victims with suspected barotrauma/ decompression sickness should be transported in the left lateral and head down, position.

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene and rescuer safety. Call appropriate public safety agencies: fire, rescue, or police teams, to properly stabilize the scene and safely rescue the victim(s) from the source of submersion. Consider need for additional EMS unit(s) for rescuer rehabilitation and/or treatment.
- b. Maintain appropriate body substance isolation precautions.
- c. Maintain an open airway immediately upon obtaining access to patient.
- d. Ensure spinal stabilization and immobilization if indicated (i.e., un-witnessed event, unconscious patient, or mechanism of injury). Assist ventilations as needed.
- e. Once the patient is rescued and is placed in a safe environment, rescuers may administer specific emergency care such as:
 - Suctioning the airway
 - Use of airway adjuncts
 - Assisted ventilations
 - Administration of oxygen.
- f. Continually assess level of consciousness, ABCs and Vital Signs.
- g. Treat all life threatening conditions as they become identified. Initiate CPR when appropriate.
- h. Obtain appropriate history related to event. (Length of exposure, temperature of liquid medium, potential for injury).
- i. If suspected hypothermia: see **Hypothermia / Cold Emergencies** protocol.
- j. If patient blood pressure drops below 90mmHg, systolic administer a 250- 500ml bolus of IV Normal saline or R/L then assess and consult .
- k. Do not delay transportation of patient if you have problem in IV access
- l. Notify receiving hospital.

6. OBSTETRICAL EMERGENCIES

These emergencies include, but are not limited to the following:

6.1. Abortion, (spontaneous, threatened, inevitable, incomplete)

6.2. Trauma

6.3. Ectopic pregnancy

6.4. Pre-eclampsia and eclampsia

6.5. Labor

6.6. Abnormal deliveries (breech, prolapsed cord, limb presentation, and multiple births)

6.7. Bleeding during any trimester

6.8. Complications of labor and delivery (antepartum hemorrhage, abruption placenta, placenta previa, uterine rupture, uterine inversion, toxemia of pregnancy, pulmonary embolism and post-partum hemorrhage).

Pre-existing medical conditions can lead to obstetrical complications. The primary concerns are diabetes, hypertension, heart disease and substance abuse. All of these conditions may adversely affect the developing fetus and therefore, may complicate the delivery of the fetus and compromise the health of the mother and child.

All obstetrical emergencies should be managed as though the patient is at risk for hypovolemic shock and should be considered an acute emergency requiring efficient management and transport per the Shock Protocol. The Obstetrical Emergencies protocol relates to normal labor and its complications and they're out of hospital management.

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain an open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
- e. Obtain appropriate S-A-M-P-L-E history related to event, (gravidity, parity, length of

- gestation, LMP estimated date of delivery, prior C-sections, prior obstetrical or gynecological complications, bleeding, pain, and vaginal discharge).
- f. Obstetric/gynecologic history and examination except vaginal examination.
 - g. Management of unscheduled field delivery with or without obstetrical complications as they are identified: (**see appropriate procedures in this protocol**)
 - a. Vaginal Bleeding
 - b. Supine-Hypotensive Syndrome
 - c. Abruptio Placenta
 - d. Pre-eclampsia and Eclampsia
 - e. Placenta Previa
 - f. Uterine Inversion
 - g. Postpartum Hemorrhage
 - h. Obstetrical emergencies that result in shock should be managed according to the Shock Protocol.
 - i. Obstetrical emergencies due to trauma should be managed according to the Abdominal Trauma Protocol: Special Considerations.
 - j. Monitor and record vital signs
 - k. Consults the medical personnel
 - l. Transport patient(s) to the nearest appropriate facility (determined by the dispatch center)
 - m. Record exact time and location (especially if in transit) of birth.
 - n. Perform neonatal resuscitation (See neonatal resuscitation protocol)
 - o. Label the child
 - p. Initiate transport as soon as possible
 - q. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
 - r. **NOTE:** EMTs should be prepared to handle a minimum of two patients (mother and infant), with a possibility of additional patients (twins, triplets, etc.). (In such cases, the two EMTs have to attend the labor while summoning.)
 - s. Notify receiving hospital.
 - t. Initiate IV normal saline 1-2 liters Normal Saline, en route to the health facility /hospital if possible, but don't delay evacuation/transportation of patients, titrate the IV fluid according to the patient's vital sign.
 - a. Give bolus 500ml if systolic blood pressure is less than 90mmHg and

- b. If there is any active bleeding
- u. Put on Cardiac monitor if available
- v. Eclamptic Seizures (Refer to seizure protocol)
- w. Contact MEDICAL CONTROL. Medical Control may order:
 - a. Administration of additional IV Normal Saline.
 - b. Lorazepam 2mg-4mg slow IV push or Intramuscularly (IM) or
 - c. Diazepam 5-10 mg slow (over 2 minutes) IV push or Intramuscularly (IM) or nasal

SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

6.1 VAGINAL BLEEDING:

- Vaginal bleeding at any given time during pregnancy is not normal and is always of concern.
- Though, the exact etiology of the bleeding cannot be determined in the out of hospital setting, the onset of bleeding may provide clues to indicate the etiology. For example,
 - Bleeding early in the pregnancy may suggest an ectopic pregnancy or spontaneous abortion.
 - Third-trimester bleeding is often the result of abruption placentae or placenta previa but it also may be the result of trauma.
- Due to the variable mechanisms for bleeding, the amount of blood loss will vary anywhere from spotting to extensive hemorrhage that will require aggressive resuscitation measures.
- **NOTE:** The amount of visualized vaginal blood loss is NOT a reliable indicator as to the actual amount of blood loss occurring. Visualized blood loss will most likely be out of proportion to the degree of shock

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain an open airway and assist ventilations as needed.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.

- e. Obtain appropriate S-A-M-P-L-E history related to event, (gravidity, parity, length of gestation, LMP estimated date of delivery, prior C-sections, prior obstetrical or gynecological complications, bleeding, pain, and vaginal discharge).
- f. Monitor and record vital signs
- g. Transport patient(s) to the nearest appropriate facility (determined by the dispatch center)
- h. Initiate transport as soon as possible
- i. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- j. Initiate IV normal saline 1-2 liters Normal Saline, en route to the health facility /hospital if possible, but don't delay evacuation/transportation of patients, titrate the IV fluid according to the patient's vital sign.
- k. Notify receiving hospital.

6.2 HYPERTENSIVE DISORDERS OF PREGNANCY:

PRE-ECLAMPSIA and ECLAMPSIA

- **Pre-eclampsia**, these disorders are characterized by hypertension, weight gain, and edema, protein in urine, and headaches and visual disturbances.
- **Eclampsia** is further complicated by seizure disorders

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain an open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway) do not use nasopharyngeal airway such mothers has bleeding tendency
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Put patient on left lateral position with tilted gravid uterus
- e. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
- f. Obtain appropriate S-A-M-P-L-E history related to event, (gravidity, parity, length of gestation, LMP estimated date of delivery, prior C-sections, prior obstetrical or gynecological complications, bleeding, pain, and vaginal discharge).
- g. Conduct Obstetric/gynecologic history and examination except vaginal examination.
- h. Initiate transport as soon as possible

- i. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
- j. **NOTE:** EMTs should be prepared to handle a minimum of two patients (mother and infant), with a possibility of additional patients (twins, triplets, etc.). (In such cases, the two EMTs have to attend the labor while summoning.)
- k. Initiate IV normal saline 1-2 liters Normal Saline, en route to the health facility /hospital if possible, but don't delay evacuation/transportation of patients, titrate the IV fluid according to the patient's vital sign.
- l. Put on Cardiac monitor if available
- m. Contact MEDICAL CONTROL. Medical Control may order:
 - Administration of additional IV Normal Saline.
 - **Lorazepam 2mg-4mg** slow IV push or Intramuscularly (IM) or
 - **Diazepam 5-10 mg** slow (over 2 minutes) IV push or Intramuscularly (IM) or nasal
- n. Notify receiving hospital.

6.3 NORMAL DELIVERY / COMPLICATIONS OF LABOR:

- **Labor** is divided into three (3) stages:
 - The **first stage** begins with the onset of uterine contractions and ends with complete dilation of the cervix
 - The **second stage** begins with the complete dilation of the cervix and ends with delivery of the fetus.
 - The **third stage** begins with the delivery of the fetus and ends with delivery of the placenta.
- In general, the most important decision to be made with a patient in labor is whether to attempt delivery of the infant at the scene or transport the patient to the hospital.
- Factors that effect this decision include: In consultation with the medical control:
 - Maternal urge to push and
 - Presence of crowning.
- The maternal urge to push and/or the presence of crowning and perianal gapping indicate that delivery is imminent. In such cases, the infant should be delivered at the scene or in the ambulance.

ASSESSMENT / TREATMENT PRIORITIES UNSCHEDULED NORMAL FIELD DELIVERY

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Determine need for imminent delivery or need for immediate transport. If the mother is pushing and signs of imminent delivery present:
- c. Position mother for delivery. Have mother lie back, if tolerated, with knees drawn up and spread apart. Elevate buttocks with pillow or blankets.
- d. Whenever possible, use sterile or aseptic technique.
- e. Coach mother to breathe deeply between contractions and to push with contractions.
- f. Support peri-anal area using a gauze pad
- g. Administer oxygen using appropriate oxygen delivery device, as clinically indicated
- h. As the head crowns control with gentle pressure and support the head during delivery and examine neck for the presence of a looped (nuchal) umbilical cord. If cord is looped around neck, gently slip it over the infant's head. If unable to do so, clamp and cut the cord.
- i. Suction mouth, then nose of the infant as soon as possible.
- j. Support the infant's head as it rotates for shoulder presentation.
- k. With gentle pressure, guide the infant's head downward to deliver the anterior shoulder and then upward to release the posterior shoulder. Complete the delivery of the infant.
- l. Hold infant firmly with head dependent to facilitate drainage of secretions. Clear infant's airway of any secretions with sterile gauze and repeat suction of infant's mouth, then nose using bulb syringe.
- m. Apply two clamps to umbilical cord (if not already done due to Nuchal cord):
 - a. The first one is placed approximately 5cm (two to three fingers) from the infant and
 - b. The second is placed 1 to 2 cm (one finger) proximal to the first clamp. Cut cord between clamps and check for umbilical cord bleeding. If umbilical cord bleeding is evident apply additional clamp(s) as needed.
- n. Dry infant and wrap in warm towels/blanket (cover infant's head).
- o. Place infant on mother's abdomen for mother to hold and support.
- p. Note and record infant's gender, time and geographical location (especially if in transit) of birth.

- q. If infant resuscitation is not necessary, record APGARscore at 1 minute and 5 minutes post-delivery.
- r. If infant resuscitation is necessary, follow neonatal resuscitation protocol.
- s. Delivery of the Placenta: (do not delay transport)
 - a. As the placenta delivers, the mother should be encouraged to push with contractions.
 - b. Hold placenta with both hands, place in plastic bag or other container and transport with mother to receiving hospital. NEVER "pull on" umbilical cord to assist placenta delivery
 - c. Evaluate perineum for tears. Apply gauze pad to the area while maintaining direct pressure.
- t. Initiate transport as soon as possible.
- u. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
- v. Notify receiving hospital.

6.4 PROLAPSED UMBILICAL CORD

This occurs when the cord slips down into the vagina or presents externally after the amniotic membranes have ruptured. Fetal asphyxia may rapidly ensue if circulation through the cord is not re-established and maintained until delivery.

- If umbilical cord is seen in the vagina,
 - Position the mother in Trendelenburg or knee-chest-position to relieve pressure on the cord.
 - Instruct the mother to "pant" with each contraction to prevent her from bearing down.
 - Contact medical control or receiving health facility and explain the condition
 - If you can't contact any one of the above feel the fetal heart beat and if the heart beat is within normal rate transport rapidly in knee-chest-position, explain to the mother why you are doing this and reassure
 - If despite the knee-chest-position still there is fetal distress, administer oxygen confirm the mother is maintaining the knee-chest-position properly and if still no change and you have to go long distance: Insert two gloved fingers into the vagina and gently elevate the presenting part to relieve pressure on the cord and restore umbilical pulse. DO NOT attempt to reposition or push the cord back into the uterus.

- If assistance is available, apply moist sterile dressings to the exposed cord, and rapid transport to the receiving hospital.

6.5. POSTPARTUM HEMORRHAGE (PPH)

This is defined as the loss of 500 mL or more of blood following delivery.

- The most common cause is:
 1. **Tone**-Lack of uterine muscle tone (atonic uterus) and is most frequent cause of PPH
 2. **Trauma**- Lacerations of the genitalia, hematomas (collection of blood in the uterus, vagina), inversion, and rupture of the uterus
 3. **Tissue**- Retained tissue from the placenta, invasive placenta (placenta deeply attached to the wall of uterus)
 4. **Thrombin** – blood clotting problem

Clinical Presentation

- Constant vaginal bleeding following delivery
- Shock - BP –low, PR-fast & feeble, RR- fast, Pallor, anxious, sweating
- Atonic uterus- boggy, non contracted uterus above the umbilicus
- Uterine rupture- easily felt uterine defect
- Retained placenta- inspect placenta carefully
- Vaginal, cervical laceration- specular exam

Sequential steps in managing PPH

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway and assist ventilations as needed.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. If boggy, non-contracted uterus is found above the umbilicus==>uterine massage- place your hand over the uterine funds externally, And apply circular massage.
- e. Misoprostol 800mcg stat PV or Sublingual OR
- f. Oxytocin 20mcg iv- 20drops/min, diluted in 1000normal saline, OR, IM,
- g. Initiate IV line en route to the hospital, 1-2 IVs of Normal Saline, Titrate IV flow rate to patient's hemodynamic status.
- h. If the systolic blood pressure is still less than 90mmhg, after the above treatment, consult the medical control or the receiving hospital.
- i. The second common cause of PPH is trauma:

- Inspect vagina and cervix for lacerations; and if you found bleeding site
 - Pack with sterile material position on shock position and contact medical control or receiving health facility
- j. If the uterus is well contracted and no laceration inspect placenta properly while rapidly transporting the patient
 - k. Continue ABCD evaluation and management as needed
 - l. Monitor, record v/s, reassure patient and notify receiving facility on the condition of the patient.

7 PEDIATRIC EMERGENCIES

7.1 Newborn resuscitation

7.2 pediatrics airway obstruction

7.3 Pediatric Respiratory Distress

7.4 Pediatric Cardio Pulmonary Arrest

7.5 Pediatric anaphylaxis

7.6 Pediatric Coma / Altered Mental Status/

7.7 Pediatric Seizures

7.1 Newborn resuscitation

- Anticipation, adequate preparation, accurate evaluation, and prompt initiation of resuscitation steps when necessary are essential for all babies born at pre-health facility level
- For all newborns It is essential
 1. To prevent heat loss
 2. To rapidly dry the infant
 3. Cover the head,
 4. Wrap the child to avoid a drop in body temperature/hypothermia/.
 5. Cord care
 6. Keep the infant in between the mothers breast (skin to skin contact)
- **If the newborn is not crying immediately after birth suspect neonatal asphyxia and start resuscitation**
 1. Maintain an open airway and suction the mouth, then nose.
 2. If meconium (brown stained fluid) is present, suction the hypo pharynx (the oral cavity)

3. Keep the newborn warm.
 - Dry the infant
 - Place on a dry blanket
 - Cover the head then
4. If the infant is ventilating adequately, administer free flow (blow-by) 100% oxygen at a minimum of 1.5 to 3 liters per minute close to the face.
5. If ventilations are inadequate or if the chest fails to rise:
 - ✓ Reposition the head and neck,
 - ✓ Suction,
 - ✓ Initiate positive pressure (bag-valve-mask) ventilations with 100% oxygen at 40-60 breaths per minute, use appropriate size bag valve mask
6. If still the newborn is not started spontaneous breath and heart rate is going down continue bag valve ventilation, make sure the chest is expanding, clear secretions if necessary
7. Contact medical control or receiving health facility and explain the condition of the newborn
8. Give due attention to warm the neonate. Close windows. Use warmed blanket.
9. Do not delay transportation

7.2. PEDIATRIC UPPER AIRWAY OBSTRUCTION

Airway obstruction can vary in severity from mild to life threatening and the child's condition may change suddenly.

Common mechanical causes or contributing factors include:

- Tongue-obstructed airway,
- Foreign bodies in the oropharynx, trachea, or esophagus;
- Allergic swelling of upper airway structures
- Chemical burns, inhalation injuries;
- Altered mental status, and
- Infectious causes are common with croup and epiglottitis being the most prevalent.

Children, especially 1 to 3 years of age, are at greatest risk for aspirating foreign objects particularly when running and/or falling.

The most common objects aspirated resulting in airway obstruction in children include coins, food particles, buttons, cereals, pins, candy, nuts, chewing gum, and grapes...

ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine presence of upper airway obstruction (stridor):
 - a. If partial obstruction due to a foreign body is suspected and the child has adequate air exchange: transport to appropriate medical facility. Do not attempt to remove foreign body in the field.
 - b. If suspected croup (barking cough, no drooling) or epiglottitis (stridor, drooling) but can maintain an open airway, place child in position of comfort and avoid upper airway stimulation,
3. Administer humidified oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Continually assess level of consciousness (AVPU), ABCs and Vital Signs.
5. Determine capillary refill status and if blood pressure is appropriate for age.
6. Obtain appropriate S-A-M-P-L-E history related to event, including recent infectious history (fever, cough, etc.) or exposure to allergens.
7. Monitor and record vital signs
8. Initiate transport as soon as possible,
9. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort
10. Notify medical control or receiving health facility

Foreign-Body Airway Obstruction (Choking)

- Signs of Foreign-Body Airway Obstruction include:
 1. *Sudden* onset of respiratory distress
 2. Coughing,
 3. Inability to speak,
 4. Gagging, stridor
- If there is foreign body obstruction:
 - For an infant, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive

- For a child, perform sub-diaphragmatic abdominal thrusts (Heimlich maneuver) until the object is expelled or the victim becomes unresponsive
- If the victim becomes unresponsive, perform CPR but should look in to the mouth before giving breaths

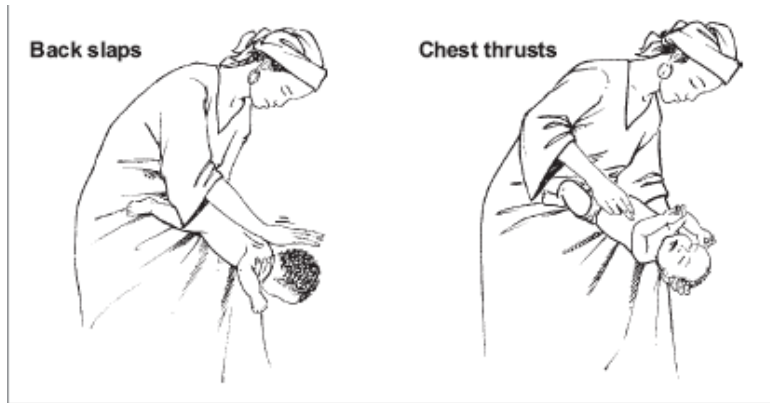


Figure chest thrusts and back slap

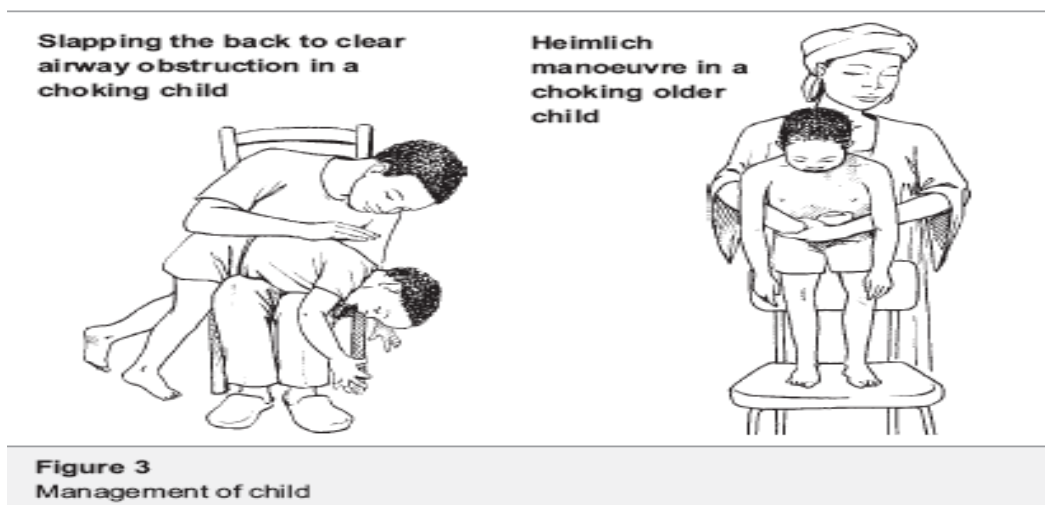


Figure 3
Management of child

7.3. Pediatric Respiratory Distress

Respiratory Distress is defined as inadequate breathing in terms of rate, rhythm, quality and/or depth of breathing. Children, who are breathing too fast or slow, or in an abnormal pattern or manner, may not be receiving enough oxygen to support bodily functions. Cyanosis is usually a late sign and requires immediate treatment.

Mild distress

In children minor wheezing and good air entry

Severe distress

In children it is evidenced:

- Extreme use of accessory muscles,
- Nasal flaring,
- Grunting,
- Irritable
- Cyanosis
- Altered mental status (weak cry, somnolence, poor responsiveness).

ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Maintain open airway, remove secretions or vomitus, and assist ventilation as needed.
- c. Determine if patient is in mild or severe distress and presence of upper airway involvement (stridor) or lower airway findings (wheezing).
- d. **Mild distress:** Administer oxygen using nasal prong 2-4l/min, put on position of comfort
- e. **Sever distress:** Administer humidified oxygen using face mask 5-10l/min,
- f. Continually assess Level of Consciousness, ABCs and vital signs. Evaluate capillary refill and determine if blood pressure is appropriate for age. (SEE APPENDIX)
- g. Obtain appropriate S-A-M-P-L-E history related to event, including prior asthma, anaphylaxis, allergies, and exposures to foreign body, foods, medicines, chemicals or envenomation
- h. Encourage and/or assist patient to self-administer his or her own prescribed inhaler medication if indicated or if not already done.
- i. If patient is unable to self-administer their prescribed inhaler, administer patient's prescribed inhaler.
- j. Initiate transport as soon as possible,
- k. Properly secure to cot, infant
- l. Contact medical control or receiving health facility if child is critical

7.4. Pediatric Cardio Pulmonary Arrest

Causes:

- Severe dehydration,
- Airway obstruction,
- Infections, sepsis,
- Asthma,
- Hypothermia and
- Drug overdose.

ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness- unresponsive
 - ✓ Open airway using head tilt chin lift or jaw thrust if trauma;
 - ✓ remove secretions, vomitus,
 - ✓ Look, listen for B- breathing/ chest movements and air coming out from nose/mouth
 - ✓ If still no breath, deliver 2rescu breaths with bag valve mask,
 - ✓ Then assess for heart beat or carotid pulse on the lateral part of neck,
 - ✓ No pulse deliver 30compression proper to age according your training (2:30/5cycle, CPR, and then check for sign of life and continue CPR as needed.
3. Administer oxygen
4. Continually assess level of consciousness, ABCs and Vital Signs, including capillary refill.
5. Obtain appropriate S-A-M-P-L-E history related to event, including possible ingestion or overdose of medications.
6. Every effort should be made to determine the possible cause(s) for Cardiac arrest (Asystole) including medical and/or traumatic etiologies.
7. Monitor and record vital signs (if any)
8. Treat for shock.
9. Initiate transport as soon as possible,
10. Properly secure to cot, or pediatric immobilization device appropriate to treatment(s) required.

BASIC PROCEDURES

- If unable to ventilate child after repositioning of airway: assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.

- Continue Cardiopulmonary Resuscitation (CPR), push hard and fast: 30:2 if you are alone or; 2:15 if you are 2
- EARLY DEFIBRILLATION if available and you are trained to use it. Select energy to 1 – 2 joules/kg.
- Use AED according to the machine instruction and standards
- Notify receiving hospital.

7.5. PEDIATRIC ANAPHYLAXIS

Anaphylaxis is an acute and generalized antigen-antibody reaction that can be rapidly fatal. Management is based upon severity. Anaphylaxis in children is unusual. As in adults, there are multiple causes of anaphylaxis: injected substances or drugs such as penicillin, cephalosporin, sulfa; other causes include food sensitivities, vaccines, insect stings, virtually any chemical or other environmental allergens.

Signs and symptoms: Urticaria, Hypotension, Wheezing, Drooling, hoarseness and stridor

1. ASSESSMENT / TREATMENT PRIORITIES

- a. Ensure scene safety and maintain appropriate body substance isolation precautions.
- b. Determine presence of upper airway involvement (stridor) or lower airway symptoms (wheezing). These may coexist. Maintain an open airway, remove secretions, vomitus and assist ventilations as needed.
- c. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
- d. Continually assess level of consciousness, ABCs and Vital Signs.
- e. Determine if blood pressure, obtained, is appropriate for age (See Appendix).
- f. Obtain appropriate S-A-M-P-L-E history related to event, including (prior allergies and/or anaphylaxis),
- g. Determine if patient is in mild or severe distress:
 1. **MILD DISTRESS:** itching, isolated urticaria, nausea, no respiratory distress.
 2. **SEVERE DISTRESS:** poor air entry, flaring, grunting, cyanosis, stridor, wheezing, abdominal cramps, respiratory distress, tachycardia, shock, edema of lips, tongue or face and generalized urticaria.

- h. Initiate transport as soon as possible,
- i. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.
- j. Prevent / treat for shock if possible
- k. If patient presents in Severe Distress, as defined in Assessment Priorities,
 - ✓ Administer Epinephrine appropriate to age/weight (0.01mg/kg, IM/IVmax 0.3mg/dose, repeat same dose after 5min if necessary/ severe symptoms not resolved).
 - ✓ Diphenhydramine (Benadryl) 1 mg/kg up to maximum single dose of 50 mg via IV push, if you have IV line
 - ✓ If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
 - ✓ Monitor vital signs and keep patient warm.
 - ✓ Notify receiving hospital.

7.6 PEDIATRIC COMA / ALTERED MENTAL/ NEUROLOGICAL STATUS/

Story from the caregiver is critical. The common causes of pediatric coma are:

1. Injury,
2. Shock,
3. CNS infections.
4. Poisoning
5. Hypoglycemia

ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed.
3. Suctioning and/or use of airway adjuncts (nasopharyngeal / oropharyngeal airway) as indicated.
4. Assume spinal injury if associated with trauma and manage accordingly.
5. Evaluate capillary refill and determine if blood pressure is appropriate for age. (**See Appendix**).

6. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
7. Continually assess level of consciousness (AVPU), ABCs and Vital Signs.
8. Obtain appropriate S-A-M-P-L-E history related to event, including diabetes, CNS disorders and/or injury, overdose, or trauma.
9. Monitor and record vital signs
10. If child is a known diabetic (or is confirmed to be hypoglycemic) who can speak and swallow, administer oral glucose or other sugar source as tolerated.
11. **CUTION:** Do NOT administer anything orally if the patient does not have a reasonable level of consciousness and normal gag reflex.
12. **Give Dextrose:** 10% 0.5 ml/kg IV Bolus (for neonates). Dextrose 25% 0.5 ml/kg IV Bolus (if estimated body weight is less than 50 kg
13. If patient is fully unconscious or seizing, transport on left side (coma position) or as needed if trauma is suspected.
14. If patient is in or exhibits signs and/or symptoms of shock, (i.e. If patient's blood pressure drops below age appropriate pressure (See Appendix), give 10 mL/kg Normal Saline fluid Bolus, if possible. Do not delay transportation to search difficult veins
15. Notify receiving hospital.
16. Initiate transport as soon as possible,
17. Properly secure to cot, infant car seat or pediatric immobilization device, in left lateral position

7.7. PEDIATRIC SEIZURES

The cause of seizure disorder is unknown. However, there are multiple other causes: hypoglycemia, head trauma, vascular disorders, meningitis, sepsis, metabolic abnormalities, poisoning, hypoxemia, tumors, epilepsy and shock.

The seizure may be followed by a post-ictal state or complete coma depending upon cause. The most common cause of seizure in **children age 1 – 4 years is "benign febrile seizure"**. These seizures usually last less than 5 minutes and are tonic-clonic (grand mal) and non-focal (generalized).

ASSESSMENT/TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Prevent patient from accidental self-harm. DO NOT use a bite block.

3. Maintain an open airway. Wipe secretions from the mouth.
4. Suction to remove secretions and/or vomitus, or use of airway adjuncts after the seizure is over.
5. Administer oxygen using appropriate oxygen delivery device, as clinically indicated or via blow-by method if seizure persists.
6. Be certain that the oropharynx is clear of secretions and/or vomitus.
7. Obtain appropriate S-A-M-P-L-E history related to event, including possible ingestion or overdose of medications.
8. Question all witnesses or bystanders as to actual event.
9. The majority of seizures are self- limiting, followed by a gradual awakening. However, prolonged or recurrent seizures may indicate status epilepticus.
10. Monitor and record vital signs
11. If child is febrile administer paracetamol suppository, PO/PR: 20mg/kg 6-hourly
Rectal loading dose 30-40mg/kg
12. Initiate transport as soon as possible,
13. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.
14. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), Initiate IV Normal Saline (KVO), while en-route to hospital, if vein is visible and/or palpable, give 10 mL/kg Normal Saline fluid Bolus.
15. Notify receiving hospital.

7.8. PEDIATRIC SHOCK

The most common cause of shock in children is acute volume loss. This can be due to: increased fluid loss (vomiting, diarrhea, hyperthermia, hemorrhage); decreased intake;

Regardless of etiology, treatment should be directed at rapid fluid replacement. Severe shock is present if the child exhibits a decreased level of consciousness, weak pulses, no palpable blood pressure, or a capillary refill of more than 2 seconds.

ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. In case of suspected head/neck injury, Ensure cervical spine immobilization /

stabilization.

3. Evaluate and maintain ABCD. Open airway and assist ventilations as needed.
4. Suction to remove secretions and/or vomitus, or use of airway adjuncts as indicated.
5. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
6. Control external bleeding sources and keep child warm.
7. Evaluate capillary refill and determine if BLOOD PRESSURE is appropriate for age.
8. Initiate IV Normal Saline (KVO), while en-route to hospital, if vein is visible and/or palpable. Give 20 mL/kg Normal Saline fluid Bolus. Do not delay transportation
9. Continually assess level of consciousness AVPU, ABCs and Vital Signs.
10. If in severe shock, position child 15° Trendelenburg (head down position).
11. Obtain appropriate S-A-M-P-L-E history related to event, such as recent illness, change in eating pattern, excessive exercise or heat exposure, and/or trauma.
12. Monitor and record vital signs
13. Initiate transport as soon as possible,
14. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.
15. Notify receiving hospital.

7.9. PEDIATRIC Traumas AND TRAUMATIC ARREST

- If a child has multiple injuries or bruises in varying stages of resolution, consider child abuse as a possible etiology.
- To resuscitate a pediatric traumatic arrest victim, aggressive in-hospital management, often times open thoracotomy, is required. The more prolonged the field time and the transport to the medical facility, the less likely the child is to survive.

ASSESSMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness
3. Maintain open airway and assist ventilations as needed.
4. Suction to remove secretions and/or vomitus, or use of airway adjuncts as indicated
5. Assume spinal injury and treat accordingly.
6. Initiate Cardiopulmonary Resuscitation (CPR), proper to age

7. Administer oxygen using bag valve mask
8. Consider potential non-traumatic causes (hypothermia, overdose, underlying medical conditions etc.)
9. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
10. When multiple patients are involved, they need to be appropriately triaged.
11. Obtain appropriate S-A-M-P-L-E history related to event, including Mechanism of Injury, and possible child abuse.
12. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility
13. Monitor and record vital signs
14. Initiate transport as soon as possible,
15. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.
16. Initiate IV Normal Saline KVO administer Fluid bolus of Normal Saline fluid bolus of 20 mL/kg if possible
17. Contact medical control or receiving health facility if child condition is critical

Appendix1

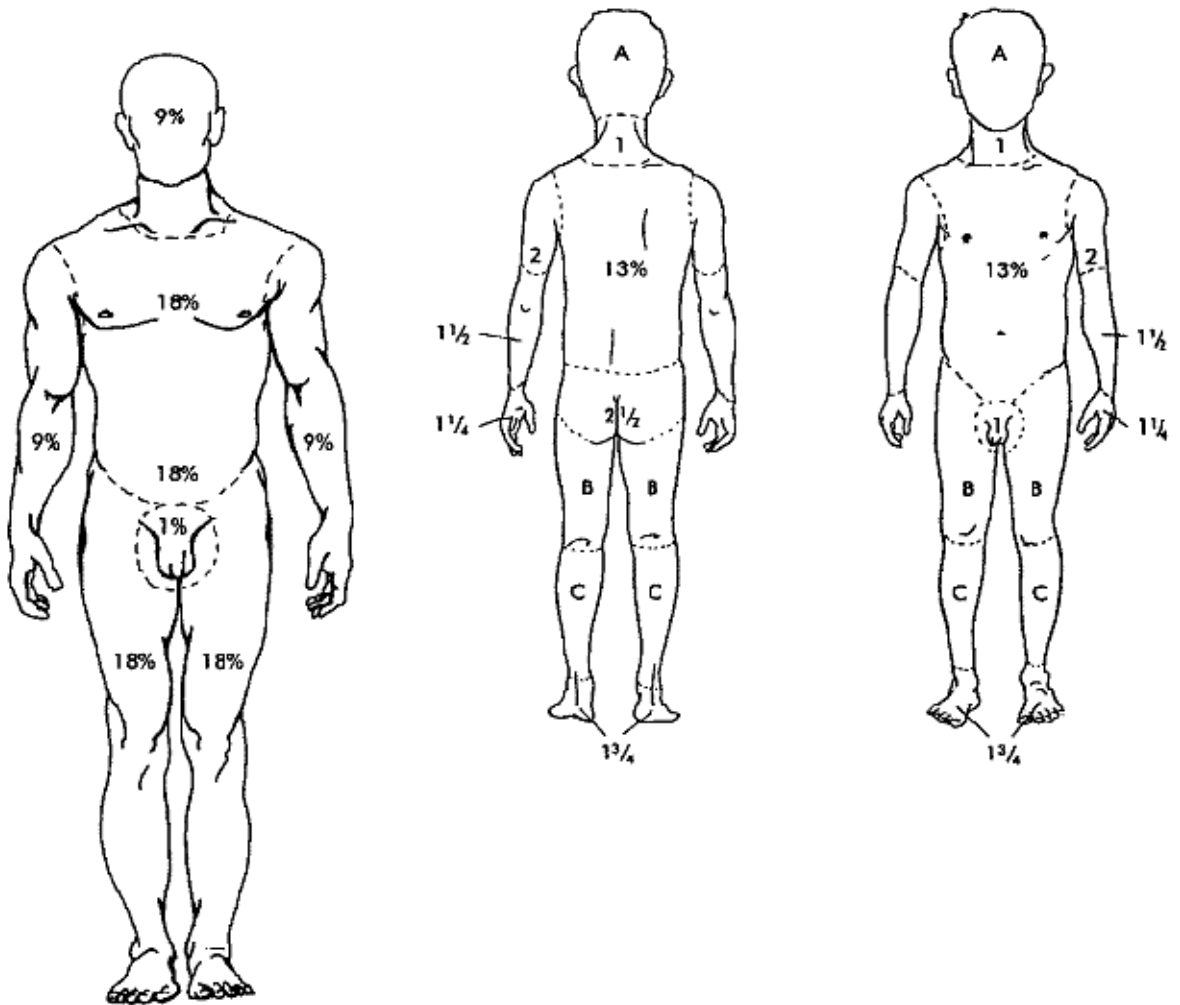
APGAR score

SIGN	0 POINTS	1 POINT	2 POINTS
HEART RATE	ABSENT	< 100	> 100
RESPIRATORY EFFORT	ABSENT	WEAK CRY	STRONG CRY
MUSCLE TONE	FLACCID	SOME FLEXION	ACTIVE MOTION
REFLEX IRRITABILITY	NO RESPONSE	GRIMACE	COUGH, SNEEZE OR CRY
COLOR	BLUE, PALE	BODY: PINK EXTREMITIES: BLUE	FULLY PINK

APPENDIX 2 PEDIATRIC VITAL SIGNS & Equipment CHART

Age Years	Weight Kg	Resp Rate	Heart Rate	Systolic Blood Pressure	Resus. Mask	Self Inflating Bag	Suction Cath. Fr.	Naso/Oro Gastric Tube	BP Cuff cm
Newborn	3 - 5	30-60	100 - 160	60-80	Infant 0-1	Pediatric	6	8	5
6 mos.	7	25-40	90-120	80-100	1	Pediatric	8	8	5
1 yr.	10	20-30	90-120	80-100	1-2	Pediatric	8	8	5
18 mos.	12	20-30	80-120	80-110	2	Pediatric	10	8	5
3 yrs.	15	20-30	80-120	80-110	3	Pediatric	10	10	5
5 yrs.	20	18-24	70-110	80-110	3	Pediatric	10	10	7
6 yrs.	20	18-24	80-100	80-110	3	Pediatric	10	10	7
8 yrs.	25	18-24	70-110	80-110	3	Adult	14	10	9.5
10 yrs.	30	16-20	70-110	90-120	3	Adult	14	12	9.5
12 yrs.	40	16-20	60-110	90-120	4	Adult	14	12	9.5
14 yrs.	50	16-20	60-105	90-120	4-5	Adult	14	14	Adult
16 yrs.	60	16-20	60-80	80-120	4-5	Adult	14	14	Adult
18 yrs.	70	16-20	60-80	80-120	5	Adult	16	16	Adult

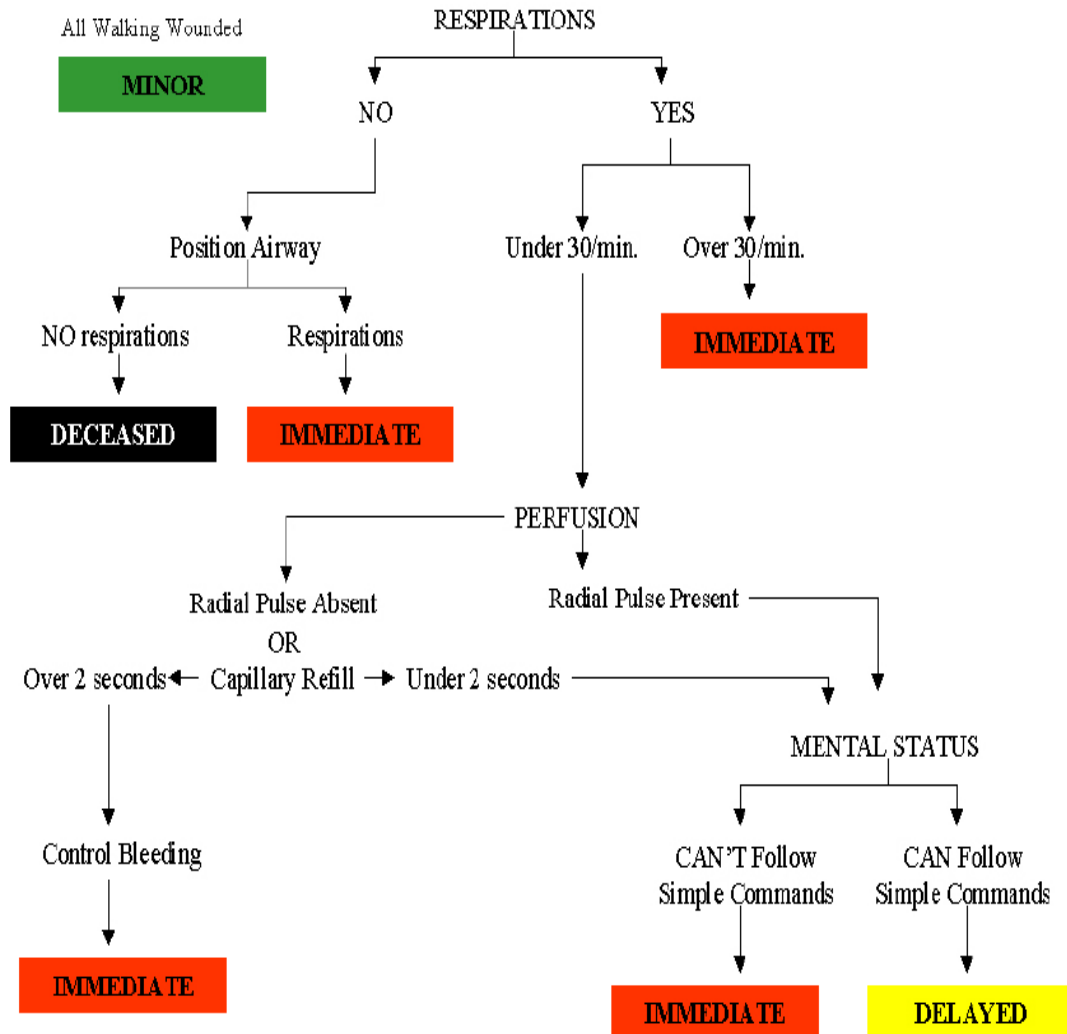
APPENDIX 3 Lund & Browder burns surface area estimation Chart



Estimation of Burn Size (Children)

Area	Age 0	1 yr.	5 yr.	10 yr.	15 yr.
A - 1/2 of head	9 1/2 %	8 1/2 %	6 1/2 %	5 1/2 %	4 1/2 %
B - 1/2 of one thigh	2 3/4 %	3 1/4 %	4 %	4 1/4 %	4 1/2 %
C - 1/2 of one leg	2 1/2 %	2 1/2 %	2 3/4 %	3 %	3 1/4 %

APPENDIX4 Triage



TRIAGE

Triage is a special process of sorting patients by the severity of injury or illness to determine the need of emergency care and transportation. This needs to be a continuous process throughout the management of an Multiple Causality Incidence.

The initial triage process should be performed by the first crew to arrive on scene and needs to be continuously reevaluated since the patient's triage status may change.

MULTIPLE CASUALTY INCIDENTS / MCI/ TRIAGE

MCI triage and treatment priorities are generally defined as:

BLACK: Deceased or live patients with obvious fatal and non-resuscitatable injuries

RED: 1st priority Severely injured patients requiring immediate care and transport. (e.g., respiratory distress, thoraco abdominal injury, severe head or maxillofacial injuries, shock/severe bleeding, severe burns)

YELLOW: 2nd priority Patients with injuries that are determined not to be immediately life threatening. (e.g., abdominal injury without shock, thoracic injury without respiratory compromise, major fractures without shock and minor burns)

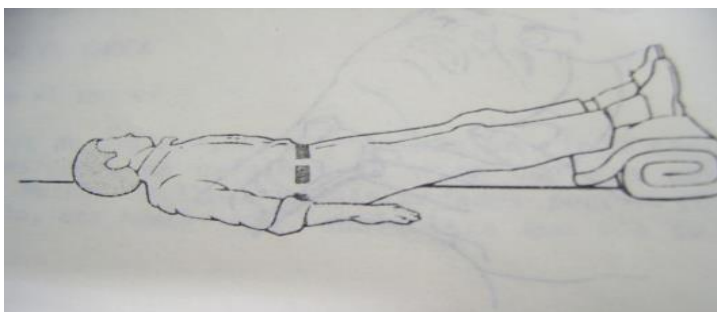
GREEN: Third priority Patients with minor injuries that do not require immediate stabilization. (e.g., soft tissue injuries, extremity fractures and dislocations, maxillofacial injuries without airway compromise and psychological emergencies)

APPENDIX5 SCENE ASSESSMENT AND TRIAGE PRIORITIES

1. Maintain universal blood and body fluid precautions.
2. The initial response team should assess the scene for potential hazards, safety and number of victims to determine the appropriate level of response.
3. Notify central dispatch to declare an MCI and need for interagency support as defined by incident level.
4. Identify and designate the following positions as qualified personnel become available:
5. Identify and designate sector areas of MCI
6. Post incident MCI Plan

APPENDIX 6 important pictures

6.1 Shock position



6.2 recovery position

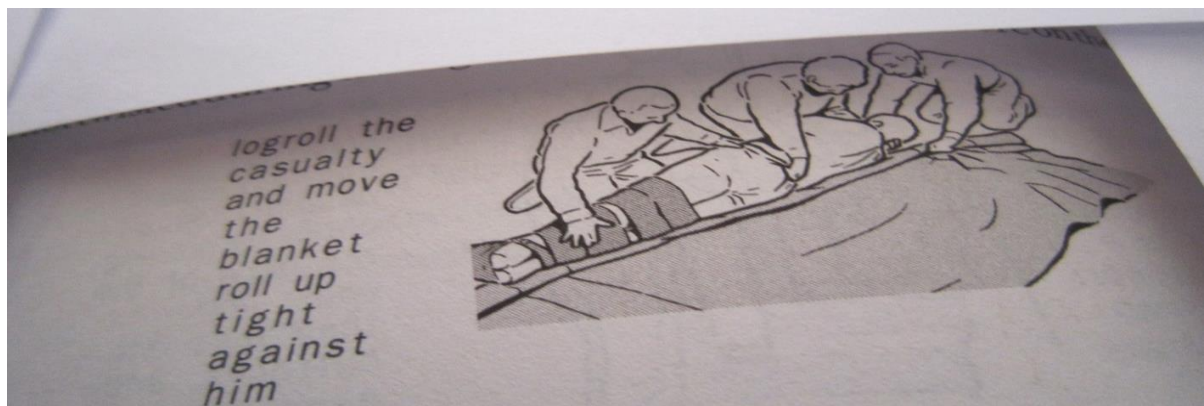
- Maintains a clear airway- allows the tongue to fall forward.
- Facilitates drainage and lessens the risk of inhaling foreign material.
- Permits good observation and access to the airway.
- Avoids pressure on the chest, which facilitates breathing.
- Provides a stable position and minimizes injury to casualty.



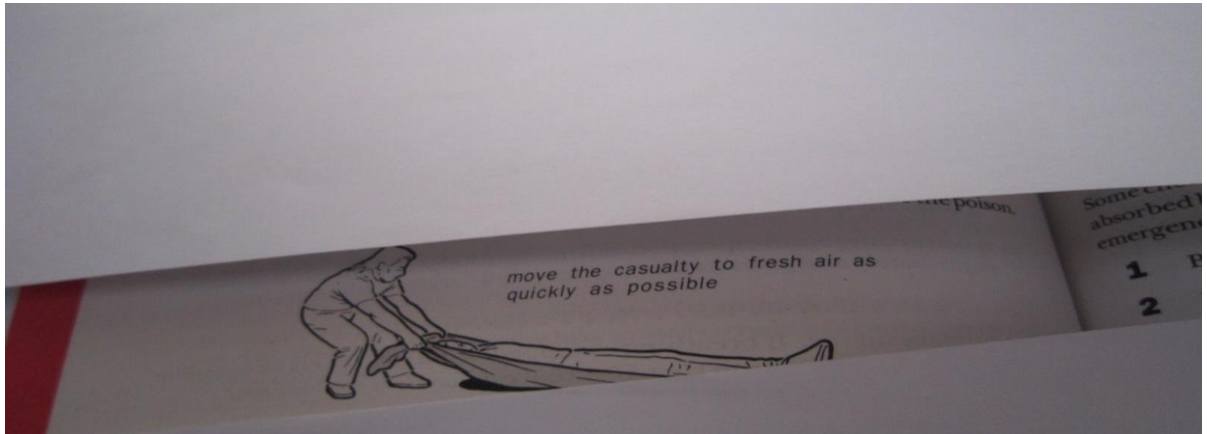
6.3 Extrication



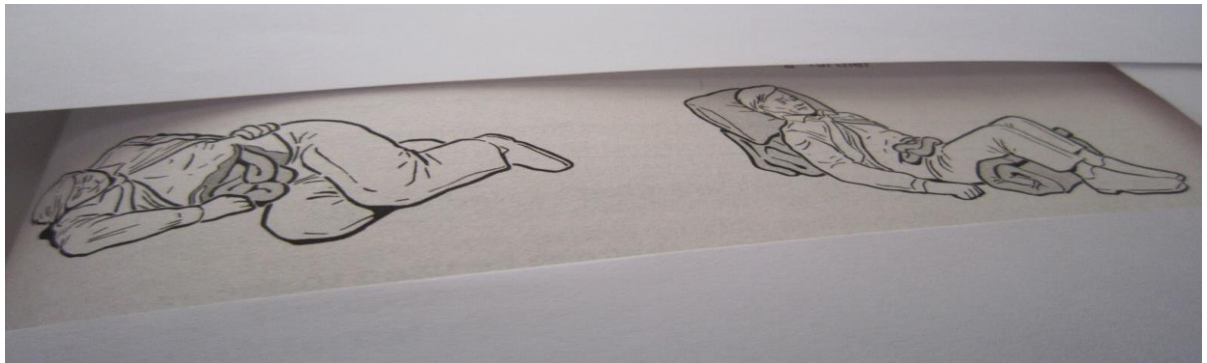
6.4 log roll



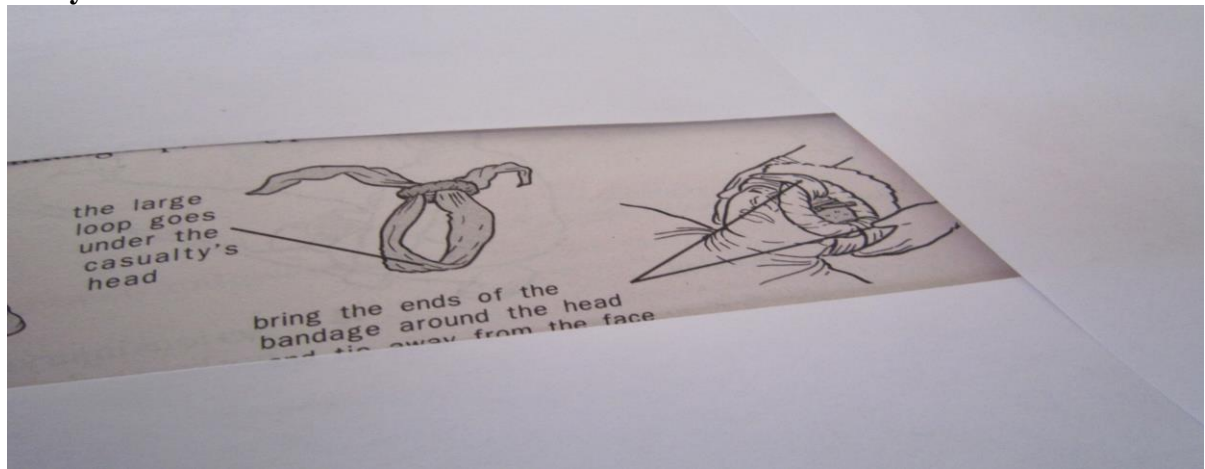
moving patient



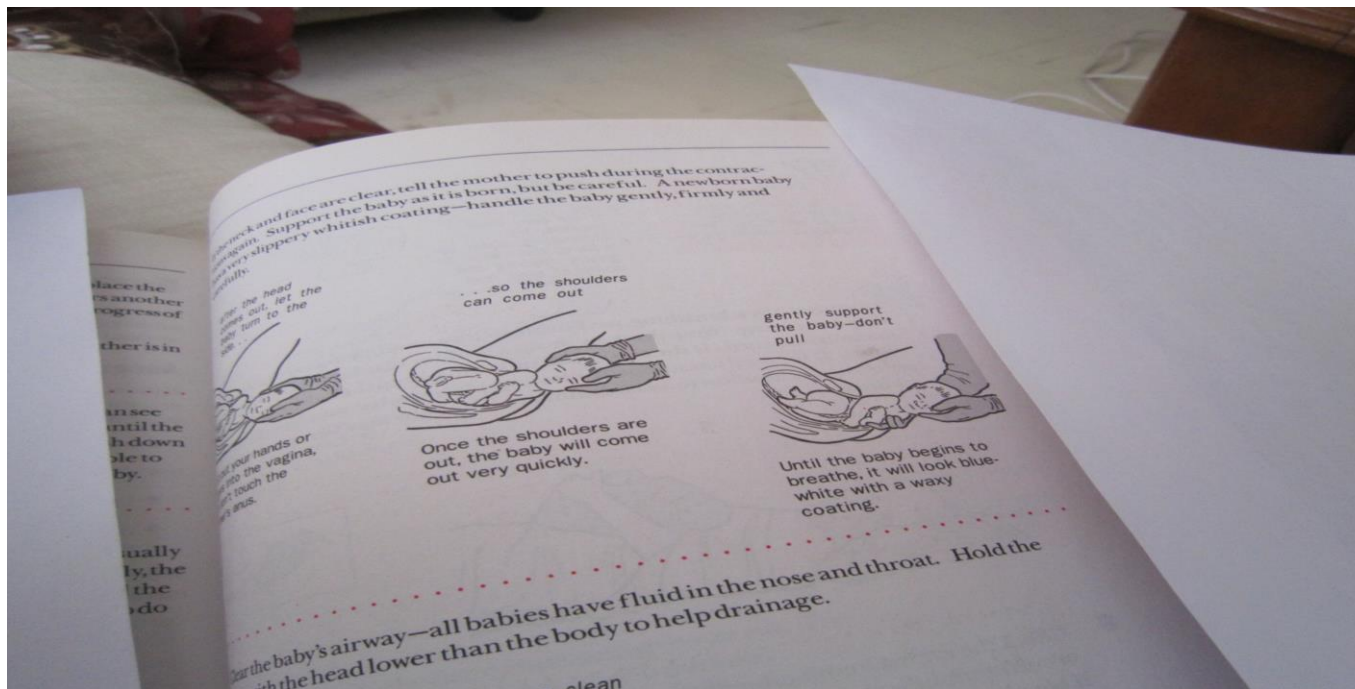
6.5 care for inveterate organ



6.6 eye trauma care



child delivery



APPENDIX 7 supply list

1. ACTIVATED CHARCOAL

Class

Adsorbent

Mechanism of Action

Adsorbs toxic substances from the GI Tract; Onset of action is immediate.

Indications

Most oral poisonings and medication overdoses; can be used after evacuation of poisons.

Contraindications

Oral administration to comatose patient; after ingestion of corrosives, caustics or petroleum distillates (ineffective and may induce vomiting); simultaneous administration with other oral drugs.

Adverse Reactions

May induce nausea and vomiting; may cause constipation; may cause black stools.

Drug Interactions

Bonds with and generally inactivates whatever it is mixed with, e.g., syrup of ipecac.

How supplied

25 gm (black powder) / 125 ml bottle (200 mg/ml)

50 gm (black powder) / 250 ml bottle (200 mg/ml)

Dosage and Administration

Note, if not in Pre-mixed slurry, dilute with 1-part charcoal/ 4 parts water.

Adult: 1-2 gm/kg PO or via NGT

Pediatric: 1-2 gm/kg PO or via NGT

Duration of action

Depends upon GI function; will act until excreted.

Special Considerations

Often used in conjunction with magnesium citrate

Must be stored in a closed container

Does not adsorb cyanide, lithium, iron, lead and arsenic.

2. ALBUTEROL

Class

Sympathomimetic, bronchodilator.

Mechanism of Action

Selective b-2 agonist, which stimulates adrenergic receptors of the sympathomimetic nervous system resulting in smooth muscle relaxation in the bronchial tree and peripheral vasculature.

Indications

Treatment of bronchospasm in patients with reversible obstructive airway disease
(**COPD/asthma**). Prevention of exercise-induced bronchospasm.

Contraindications

Known prior hypersensitivity reactions to Albuterol.

Tachycardia, dysrhythmias, especially those caused by digitalis.

Synergistic with other sympathomimetics

Adverse Reactions

Often dose-related and include restlessness, tremors, dizziness, palpitations, tachycardia, nervousness, peripheral vasodilatation, nausea, vomiting, hyperglycemia, increased blood pressure and paradoxical bronchospasm

Drug Interactions

Tricyclic antidepressants may potentate vasculature effects.

Beta-blockers are antagonistic.

May potentate hypokalemia caused by diuretics.

How Supplied

Solution for aerosolization: 0.5% (5 mg/ml)

Metered Dose Inhaler: 90 mcg/metered spray (17 gm canister with 200 inhalations)

Syrup: 2 mg/5 ml

Dosage and Administration

Adult: Administer 2.5 mg. Dilute 0.5 ml of 0.5% solution for inhalation with 2.5 ml normal saline in nebulizer and administer over 10-15 minutes.

MDI: 1-2 inhalations (90-180 mcg). Five minutes between inhalations

Pediatric: Administer solution of 0.01 - 0.03 ml (0.05 - 0.15 mg/kg/ dose diluted in 2 ml of 0.9% Normal Saline. May repeat every 20 minutes three times.

Duration of Action

Onset in 5-15 minutes, with peak effect in 30-minutes - two hours and duration of 3-4 hours.

Special Considerations

Antagonized by beta-blockers (e.g., Inderal, Metoprolol)

May precipitate angina pectoris and dysrhythmias.

Should only be administered by inhalation methodology in pre-hospital management.

3. ASPIRIN

Class:

Platelet inhibitor, anti-inflammatory agent

Mechanism of Action:

Prostaglandin inhibition.

Indications:

New onset chest pain suggestive of Acute Myocardial Infarction

Contraindications:

Hypersensitivity.

Gastrointestinal bleeding.

Adverse Reactions:

Heartburn.

GI bleeding.

Nausea, vomiting.

Wheezing in allergic patients.

Prolonged bleeding.

Drug Interactions:

Use with caution in patients allergic to NSAIDS.

How Supplied:

160 mg or 325 mg tablets (chewable and standard)

Dosage and Administration:

160 mg or 325 mg PO

Duration of Action:

Onset: 30-45 minutes.

Peak effect: variable.

Duration: Variable.

Special Considerations:

Not recommended in pediatric population.

4. ATROPINE SULFATE**Class:**

Anticholinergic agent.

Mechanism of Action:

Para sympatholytic: inhibits action of acetylcholine at postganglionic parasympathetic neuroeffector sites.

Increases heart rate in life-threatening Brady dysrhythmias

Indications:

Hemodynamically significant bradycardia

Asystole.

Drug of choice for organophosphate poisoning

Bronchospastic pulmonary disorders

Contraindications:

Tachycardia.

Hypersensitivity.

Unstable cardiovascular status in acute hemorrhage and myocardial ischemia

Narrow-angle glaucoma.

Adverse Reactions:

Headache, dizziness, palpitations, nausea and vomiting

Tachycardia, dysrhythmias, anticholinergic effects (blurred vision, dry mouth, urinary retention)

Paradoxical bradycardia when pushed slowly or at low doses.

Flushed, hot dry skin.

Drug Interactions:

Potential adverse effects when administered with digoxin, cholinergic, physostigmine.
Effects enhanced by antihistamines, procainamide, quinidine, antipsychotics,
benzodiazepines and antidepressants.

How Supplied:

Prefilled syringes: 1 mg in 10 ml of solution.

Nebulizer: 0.2% (1 mg in 0.5 ml) and 0.5% (2.5 mg in 0.5 ml).

Injection Solution as Sulfate: 0.5mg/ml (1ml); 1mg/ml (1ml);
0.1mg/ml (5ml,10ml); 0.4mg/ml (1ml, 20ml)

Dosage and Administration: Adult:

- **Bradydysrhythmias:** 0.5 - 1 mg IV every 3-5 minutes as needed to maximum total dose of 0.04 mg / kg.
- **Asystole:** 1 mg IV push every 3-5 minutes as needed to maximum total dose of 0.04 mg / kg

Pediatric:

- **Brady dysrhythmias:** 0.02 mg / kg IV / IO (minimum single dose 0.1 mg, maximum single dose 1 mg).
- **Asystole:** Same as for Brady dysrhythmias: minimum dose 0.1 mg; maximum dose 0.5 mg for a child and 1 mg for adolescent.

5. DEXTROSE**Class**

Carbohydrate, hypertonic solution.

Mechanism of Action

Rapidly increases serum glucose levels.

Short-term osmotic diuresis.

Hypoglycemia, altered level of consciousness, coma of unknown etiology, seizure of unknown etiology, status epilepticus (controversial).

Contraindications**Adverse Reactions**

Extravagation leads to tissue necrosis.

Drug Interactions

Sodium bicarbonate, coumadin.

25 gm/ 50 ml pre-filled syringes (500 mg/ml)

Dosage and Administration

Pediatric: 0.5-1 gm/kg/dose slow IV; may be repeated as necessary.

Duration of Action

Peak effects: variable.

Duration: Variable.

Administer thiamine prior to D50 in known alcoholic patients.

Draw blood sugar before administering.

How Supplied

Adult: 12.5-25 gram slow IV; may be repeated as necessary.

Onset: less than 1 minute.

Special Considerations

Do not administer to patients with known CVA unless hypoglycemia documented.

6. GLUCOSE - ORAL**Class**

Hyperglycemic.

Mechanism of Action

Provides quickly absorbed glucose to increase blood glucose levels.

Indications

Conscious patients with suspected hypoglycemia.

Contraindications

Decreased level of consciousness, nausea, vomiting

Adverse Reactions

Nausea, vomiting.

Drug Interactions

None.

How Supplied

Glucola: 300 ml bottles.

Glucose pastes and gels in various forms.

Dosage and Administration

Adult: Should be sipped slowly by patient until clinical improvement noted.

Pediatric: Same as adult.

Duration of Action

Onset: Immediate.

Peak Effect: Variable.

Duration: Variable.

Special Considerations

As noted in indications section.

7. DIAZEPAM

Class

Benzodiazepine, sedative-hypnotic, anticonvulsant

Mechanism of Action

Potentates effects of inhibitory neurotransmitters.

Induces amnesia and sedation.

Indications

Acute anxiety states, acute alcohol withdrawal, muscle relaxant, seizure activity, agitation.

Analgesia for medical procedures (fracture reduction, cardioversion) Delirium tremens.

Contraindications Hypersensitivity, glaucoma, Coma, shock, substance abuse, head injury.

Adverse Reactions

Respiratory depression, hypotension, drowsiness, ataxia, reflex tachycardia, nausea, confusion, thrombosis and phlebitis

Drug Interactions

Incompatible with most drugs, fluids

How Supplied

10-mg/5 ml prefilled syringes, ampules, vials and Tubex

Dosage and Administration

Seizure activity

Seizure activity: Adult: 5-10 mg IV q 10-15 minutes prn (5 mg over 5 min.)(maximum dose = 30 mgs.)

Rectal diazepam: 0.5 mg/kg via 2" rectal catheter and flush with 2-3 ml air after administration. :

Pediatric: 0.2-0.3 mg/kg/dose IV every 15-30 minutes (no faster than 3 mg over 5 minutes) (max. = 10 mg).

Sedation for cardioversion: 5- 15 mg IV over 5-10 minutes prior to cardio version.

Duration of Action

Peak effect: minutes.

Duration: 20-50 minutes.

Onset: 1-5 minutes.

Special Considerations

Reduce dose 50% in elderly patient.

8. DIPHENHYDRAMINE**Class**

Antihistamine; anticholinergic

Mechanism of Action

Blocks cellular histamine receptors; decreases vasodilatation; decreases motion sickness.

Reverses extrapyramidal reactions.

Indications

Symptomatic relief of allergies, allergic reactions, anaphylaxis, acute dystonic reactions (phenothiazines) Blood administration reactions; used for motion sickness, high fever.

Contraindications

Asthma, glaucoma, pregnancy, hypertension, narrow angle glaucoma, infants, patients taking Monoamine Oxidase Inhibitors.

Adverse Reactions

Sedation, hypotension, seizures, visual disturbances, vomiting, urinary retention, palpitations, dysrhythmias, dry mouth and throat, paradoxical CNS excitation in children

Drug Interactions

Potentates effects of alcohol and other anticholinergics, may inhibit corticosteroid activity, MAOIs prolong anticholinergic effects of diphenhydramine.

How Supplied

Tablet: 25, 50 mg; Capsules: 25, 50 mg.

50 or 100 mg prefilled syringes, vials (IV or IM); elixir 12.5 mg/5 ml.

Dosage and Administration

Adult: 25 - 50 mg IM or IV or P.O.

Pediatric: 1-2 mg/kg IV, IO slowly or IM. If given PO: 5 mg./ kg./ 24 hours.

Duration of Action

Onset: 15-30 minutes.

Peak effect: 1 hour.

Duration: 3-12 hours.

Special Considerations

Not used in infants or in pregnancy

If used in anaphylaxis, will be in conjunction with epinephrine, steroids.

9. EPINEPHRINE

Class: Sympathomimetic.

Mechanism of Action

Direct acting alpha and beta agonist

Alpha: bronchial, cutaneous, renal and visceral arteriolar vasoconstriction.

Beta 1: positive inotropic and chronotropic actions, increases automaticity.

Beta 2: bronchial smooth muscle relaxation and dilation of skeletal vasculature

Blocks histamine release.

Indications

Cardiac arrest, asystole, PEA, VF unresponsive to initial defibrillation

Severe bronchospasm, asthma, bronchiolitis

Anaphylaxis, acute allergic reactions

Contraindications

Hypertension, hypothermia, pulmonary edema, coronary insufficiency, hypovolemic shock

Adverse Reactions

Hypertension, dysrhythmias, pulmonary edema, anxiety, psychomotor agitation, nausea,
angina, headache, restlessness

Drug Interactions

Potentates other sympathomimetic

Deactivated by alkaline solutions.

How Supplied

1 mg / ml (1:1,000) ampules and 0.1 mg / ml (1:10,000) prefilled syringes.

Auto-injectors: EPI-Pen: 0.3 mg / ml

EPI-Pen Jr.: 0.15mg/ml

Dosage and Administration

Adult

Allergic reactions and asthma: 0.3 - 0.5 mg (0.3 - 0.5 ml 1:1000) IM

Anaphylaxis: 0.3 - 0.5 mg (3- 5 ml 1:10,000) IV

Cardiac: (asystole, PEA, VF) 1 mg IV push (1:10,000) every 3- 5 minutes

Epinephrine Infusion: 1-10 mcg/minute, for example: Mix Epinephrine (1:1000) 1 mg in 250 mL Normal Saline. (15 micro drops/minute = 1 mcg / min.)

Pediatric

Allergic reactions and asthma: 0.01 mg/kg (0.01 mL/kg 1:1000) IM to maximum of 0.5 mg.

Cardiac: (asystole, PEA, VF)

IV, IO: Standard initial dose: 0.01 mg/kg (1:10,000, 0.1mL/kg)

Epinephrine Infusion: Administer 0.1-1 mcg/kg/min IV or IO.

For example:mix 1mg of Epinephrine 1:1000 in 250mL of Normal Saline,
(15 micro drops/minute = 1 mcg / min.)

10. HYDROCORTISONE/METHYLPREDNISOLONE

Class

Corticosteroid.

Mechanism of Action

Replaces absent glucocorticoids; suppresses acute and chronic inflammation;
immunosuppressive effects.

Indications

Anaphylaxis, asthma, spinal cord injury, croup, elevated intracranial pressure (prevention and treatment), adrenal insufficiency, as an adjunct to treatment of shock.

Contraindications

Hypersensitivity to product

Adverse Reactions

Hypertension, sodium and water retention, GI bleeding, TB

None from single dose

Drug Interactions

Calcium

Metaraminol.

How Supplied

Hydrocortisone 100 mg/ 2 ml. vials

Methylprednisolone 125 mg./2 ml. and 40 mg./2 ml. vials.

Dosage and Administration

Hydrocortisone, 2 mg./kg. IV bolus to maximum of 100 mg.; 100 mg. in adult

Methylprednisolone 2 mg./kg/ IV bolus to maximum of 125 mg.; 125 mg. in adult

Duration of Action

Onset: Minutes to Hours (depending on indication).

Peak effects: 8-12 hours.

Special Consideration

Protect medication from heat.

Toxicity and side effects with long-term use

11. LACTATED RINGERS Solution

Class: Isotonic crystalloid

Mechanism of Action: Volume Replacement

.

Indications: Hypovolemic Shock

Contraindications: Congestive Heart failure, Renal Failure

Adverse Reactions: Rare

Drug Interactions: None

How Supplied: IV Infusion

Dosage and Administration:

Adult: (Systolic <90 mmHg) Infuse wide open until systolic pressure of 100mmHg is obtained.

(Systolic 100mmHg or >) Infuse at a rate of 100 ml/hr.

Pedi: 20 ml/kg repeated as required based on hemodynamic response

12. MAGNESIUM SULFATE

Class

Electrolyte

Mechanism of Action

Reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholinesterase release at the myoneural junction; manages seizures in toxemia of pregnancy; induces uterine relaxation; can cause bronchodilation after beta-agonists and anticholinergics have been used.

Indications

Seizures of eclampsia (Toxemia of pregnancy)

Torsades de Pointes

Hypomagnesaemia

Digitalis-induced dysrhythmias.

Class IIa agent for refractory VF and VT after administration of Lidocaine doses.

Contraindications

Heart blocks.

Renal diseases.

Adverse Reactions

Respiratory and CNS depression

Hypotension, cardiac arrest and asystole may occur.

Facial flushing, diaphoresis, depressed reflexes

Circulatory collapse.

Drug Interactions

May enhance effects of other CNS depressants.

Serious changes in overall cardiac function may occur with cardiac glycosides.

How Supplied

2 ml and 10 ml vials of a 50% solution

Dosage and Administration

Adult: Seizure activity associated with pregnancy: 1-4 gm IV over 10 minutes. For Torsades de Pointes or Refractory VF/VT: 1-2 grams IV over 1-2 minutes.

Pediatric: Asthma/bronchospasm, severe: 25 mg./kg. over 10 minutes IV.

Usually mixed in 50-100 CC of NS to be given IV.

Duration of Action

Onset: Immediate.

Peak effect: variable.

Duration: 3-4 hours.

Special Considerations

Pregnancy safety: Recommended that drug not be given in the 2 hours before delivery, if possible.

IV calcium gluconate or calcium chloride should be available as antagonist if needed.

Use with caution in patients with renal failure.

13. NITROGLYCERIN

Class

Vasodilators.

Mechanism of Action

Smooth muscle relaxant acting on vascular, bronchial, uterine and intestinal smooth muscle
Dilation of arterioles and veins in the periphery, reduces preload and afterload, decreases the
work load of the heart and, thereby, myocardial oxygen demand.

Indications

Acute angina pectoris

Ischemic chest pain

Hypertension.

CHF, pulmonary edema

Contraindications

Hypotension, hypovolemia

Intracranial bleeding or head injury

Adverse Reactions

Headache, hypotension, syncope, reflex tachycardia, flushing.

Nausea, vomiting, diaphoresis, muscle twitching

Drug Interactions

Additive effects with other vasodilators

Incompatible with other drugs IV.

How Supplied

Tablets: 0.15 mg (1/400 grain); 0.3 mg (1/200 grain); 0.4 mg (1/150 grain); 0.6 mg (1/100 grain).

NTG spray: 0.4 mg - 0.8 mg under the tongue.

NTG IV (TRIDIL).

Dosage and Administration

Adult:

Tablets: 0.3 - 0.4 mg SL; May repeat in 3-5 minutes to maximum of 3 doses.

NTG spray: 0.4 mg under the tongue; 1-2 sprays.

NTG IV infusion: 5 mcg / min.; increase by 5-10 mcg / min. every 5 minutes until desired effect.

Pediatric: not recommended.

Duration of Action

Onset: 1-3 minutes.

Peak effect: 5-10 minutes.

Duration: 20-30 minutes or if IV, 1-10 minutes after discontinuation of infusion.

Special Considerations

Hypotension more common in geriatric population

NTG decomposes if exposed to light or heat.

Must be kept in airtight containers.

Active ingredient may have a stinging effect when administered SL.

14. OXYGEN

Class

Naturally occurring atmospheric gas

Mechanism of Action

Reverses hypoxemia.

Indications

Confirmed or expected hypoxemia

Ischemic chest pain

Respiratory distress

Prophylactically during air transport

Confirmed or suspected carbon monoxide poisoning

All other causes of decreased tissue oxygenation

Decreased level of consciousness

Contraindications

Certain patients with COPD, emphysema who will not tolerate Oxygen concentrations over 35%;

Hyperventilation.

Adverse Reactions

Decreased level of consciousness and respiratory depression in patients with chronic CO₂ retention.

Retrolental fibroplasia if given in high concentrations to premature infants. (maintain 30-40% O₂)

Drug Interactions

None.

How Supplied

Oxygen cylinders (usually green and white) of 100% compressed oxygen gas).

Dosage and Administration

Adult:

Cardiac arrest and Carbon Monoxide poisoning: 100%.

Hypoxemia: 10-15 L/ min. via non-rebreather.

COPD: 0-2 L/ min. via nasal cannula or 28-35% venturi mask. Be prepared to provide ventilatory support if higher concentrations of oxygen needed.

Pediatric: Same as for adult with exception of premature infant.

Duration of Action

Onset: Immediate.

Peak effect: not applicable.

Duration: Less than 2 minutes.

Special Considerations

Be familiar with liter flow and each type of delivery device used.

- Nasal prong -1-5lit/min
- Face mask – 5-15lit/min

Supports possibility of combustion.

15. Paracetamol

Mild to moderate analgesic and antipyretic

Side-effects Liver damage in overdose

Dose

Neonates: 10-15mg/kg 6-hourly (5mg/kg if jaundiced) Max 60mg/kg/d

(Pediatric) PO/PR: 20mg/kg 6-hourly Rectal loading dose 30-40mg/kg

(Adult) PO:0. 5-1g qds slow IV:0. 5-1g qds

16. Tramadol

Opioid analgesic thought to have less respiratory depression, constipation, euphoria, or abuse potential than other opioids. Has opioid and non-opioid mechanisms of action

Cautions and contraindications

Only 30% antagonized by naloxone. Caution in epilepsy. Previously not recommended for intra-operative use, MAOI

Side-effects

Nausea, dizziness, dry mouth. Increased side effects in conjunction with other opioids

Dose

(pediatric) 1-2mg/kg 6-hourly

(adult) PO:50-100mg 4-hourly. Slow IV/IM: 50-100mg 4-hourly

(100mg initially then 50mg increments to maximum 250mg)Maximum
600mg/d