

91W10  
Advanced Individual  
Training Course



Clinical Handbook  
Supportive Care 4

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**TERMINAL LEARNING OBJECTIVE**

Given a deceased casualty provide post-mortem care.

***Process Used to Declare a Person Dead***

Hospital policies state who is responsible for pronouncing the death of the patient. The physician is the best qualified and is usually responsible for declaring a person dead.

***Changes That Occur in the Body after Death***

**Post-mortem Cooling (Algor Mortis)**

- (1) Occurs when no further heat is produced by metabolism. Body temperature falls gradually after death (approximately 1.0 to 1.5 degrees F/hr.)
- (2) Cooling continues until room temperature is reached in about 24 hours

**Muscular Rigidity (Rigor Mortis)**

- (1) Begins about 6 hours after death
- (2) First evident in the muscles of the jaw, then extends to involve all the muscles in the body 12 to 14 hours after death
- (3) Condition where the muscles become rigid. The body is fixed in the position in which it lies.

**Purple Discoloration (Livor Mortis)**

- (1) Reddish-purple discoloration that develops in the dependent parts of a dead body
- (2) First evident about 30 minutes after death and fully developed in 6-10 hours
- (3) Discoloration is caused by blood flowing passively into the dependent parts of the body

**Decomposition (Putrefaction)**

- (1) The destruction of a dead body by bacteria
- (2) The rate at which changes develop depends on the environment. Hot, moist conditions favor putrefaction, but cold, dry air delays or prevent it.
- (3) The body of the deceased should be placed in refrigeration in the morgue as soon as possible
- (4) It is best not to keep the body on the nursing unit more than one hour
- (5) Embalming is used as a method of chemically preserving the body. A solution is introduced into the body that kills the bacteria and prevents the rapid decomposition of tissues.

**Death Certificate**

U.S. laws require that a death certificate be prepared for each person who dies.

Death certificates are sent to local health departments, which compile statistics from the information

A physician is usually responsible for declaring a person dead and is required to sign the death certificate

**Organ Donation and Autopsy**

Patients who express a wish to donate functional organs after death should be provided an organ donor consent card

The family of a deceased client may decide to donate the client's organs and should also be provided with information and consent forms

An autopsy is an examination of the organs and tissue of a human body after death

The closest surviving family member usually has the authority to consent for an autopsy

- (1) It is usually the physician's responsibility to obtain permission for an autopsy
- (2) The client may have granted permission before his death
- (3) If the death was caused by accident, suicide, homicide, or illegal therapeutic practice, the coroner must be notified and he will decide if an autopsy is necessary
- (4) The family's consent is not needed in these cases
- (5) Many relatives find comfort when they are told that the knowledge gained from an autopsy may contribute to advancements in medical science as well as establish the exact cause of death

***Responsibility in Preparing the Body***

- a. Provide privacy for the patient and/or family
- b. Verify that the patient has died, and has been pronounced dead by the physician
- c. Notify appropriate persons in the hospital, as well as the clergy, if requested by the family
- d. Obtain the death pack
- e. Wear gloves when preparing the body
- f. Position the body supine in proper alignment, close the eyelids, and place a pillow under the head. If the eyes are to be donated, place a small ice pack on each eye.
- g. Change all dressings; if appropriate, remove jewelry and eyeglasses and place with personal belongings, and replace dentures, if possible
- h. Bathe the body
  - (1) Using plain water, wash the areas of the body that may be soiled with blood, feces, or emesis
  - (2) If drainage occurs around the rectum, urethra or vagina, place a gauze 4 X 4 over each opening and secure it with tape to prevent further soiling
- i. Arrange the hair neatly
- j. Care of drainage and other tubes
  - (1) If there is to be an autopsy, the tubes are generally left in the body
  - (2) Remove the drainage bottles or bags from the tubes and fold the tubes over twice; secure each with a rubber band to avoid leakage

- (3) Make sure you deflate the balloon tips so as not to injure the body tissues upon removal
- k. Apply a clean patient gown and clean bed linen if the family will be viewing the body; leave the head uncovered and have the room arranged neatly
- l. Prepare the family before viewing the body: offer support and your physical presence if desired, during their visit, and assist them with funeral arrangements, if necessary
- m. Identify and assemble the patient's personal belongings for the family; complete a full inventory of the patient's belongings
- n. Attach 3 forms of identification. Two tags are placed on the body (usually the great toe and the wrist). A third tag is placed on the shroud or zippered bag.
- o. You may need to tie a bandage lightly under the jaw and up around the head to keep the jaw closed
- p. Lightly bandage the wrists together, criss- crossed over the abdomen to prevent the arms from falling off the stretcher when the body is being moved to the morgue
- q. Place the body within the shroud or zippered bag
- r. Transport the body to the morgue
  - (1) Place the body on a stretcher and secure it with straps
- s. Record the procedure before the body leaves the nursing unit
  - (1) Record the time and date body was taken to the morgue or by the undertaker
  - (2) If valuables were placed in safekeeping, indicate this in writing
  - (3) If valuables were given to the family or friends, record name of the person(s) to whom they were given, their relationship to the deceased, and the time and date
  - (4) Have a co-worker who witnessed this action co-sign with you in the notes

***Role in Caring for the Family of the Deceased Client***

After death, the soldier medic must continue to provide care for the family of the deceased client

- (1) Listen to the family's expression of grief and loss
- (2) Allow family members to see the client's body. This will help them to accept the death fully.
- (3) Provide a private place for the family to grieve and make necessary arrangements
- (4) Contact the chaplain if the family requests

***Deaths on the Battlefield***

- On the battlefield when KIA's are identified a spot report is generated identifying the location of the remains so that when the battle is over the remains can be recovered and turned over to mortuary affairs.
- It is standard to use a 10 digit grid coordinate
  - (1) 10 Digit Grid coordinate will identify a 1 square meter location within a grid square for the location of the body
  - (2) A global positioning system (GPS) can also be used to document the location of a body

**TERMINAL LEARNING OBJECTIVE**

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, you encounter a casualty with an open wound who is breathing. The casualty has been initially assessed and injury(ies) prioritized.

***Closed wound injury***

- (1) Contusion - Hematoma beneath unbroken skin because of small vessel ruptures
- (2) Crush injuries - Overlying skin may remain intact, injury to multiple tissues, muscle or bone injury

***Open wound injury***

- (1) Abrasions - Partial thickness skin loss
- (2) Lacerations - Break in skin of varying depth
- (3) Avulsion - Full thickness skin loss, degloving or flap injuries are avulsions
- (4) Amputations - A part of the body is partially or completely severed or torn from the body
- (5) Punctures/ penetrations - Caused by a foreign object that enters the body, underlying damage can be extensive
- (6) Bite - Breakage of the skin caused by animal or human teeth, all bites are considered contaminated

***Identify forms of wound healing***

**Three types of wound healing**

- (1) Primary intention (primary union)
  - (a) Wounds that are made surgically
  - (b) Little tissue loss
  - (c) Skin edges are close together and minimal scarring
  - (d) Healing begins during the inflammatory phase
- (2) Secondary intention (granulation)
  - (a) Healing occurs when skin edges are not close together (approximated) or when pus has formed
  - (b) If wound is producing or containing pus (purulent) a drainage system is established or the wound is packed with gauze
  - (c) Slowly the necrotized tissue decomposes and escapes
  - (d) The cavity begins to fill with soft, pink, fleshy projections consisting of capillaries surrounded by fibrous collagen (granulation tissue)
  - (e) The amount of granulation tissue required depends on the size of the wound
  - (f) Scarring is greater in a large wound
- (3) Tertiary (third) intention
  - (a) Delayed primary closer
  - (b) Two layers of granulation tissue are sutured together
  - (c) Occurs when:
    - (i) Contaminated wound is left open and sutured closed after the infection is controlled
    - (ii) Delayed suturing of a wound

- (iii) Primary wound becomes infected, is opened, is allowed to granulate, and is then sutured
- (d) Results in a larger and deeper scar than primary or secondary intention

**Factors promoting wound healing**

- (1) Adequate oxygenation
- (2) Adequate rest or local immobilization
- (3) Sufficient blood supply
- (4) Proper nutrition
  - (a) Nutrients are needed for wound repair and prevention of infection
  - (b) Adequate wound healing is dependent upon the availability of essential nutrients

**Factors that impair wound healing**

- (1) Age - causes slower regeneration of tissue
  - (a) Physiological Effects
    - (i) Alters all phases of wound healing
    - (ii) Vascular changes impair circulation to wound site
    - (iii) Reduced liver function alters synthesis of clotting factors
    - (iv) Formation of antibodies and lymphocytes is reduced
    - (v) Collagen tissue is less pliable
    - (vi) Scar tissue is less elastic
  - (b) Interventions
    - (i) Instruct patient on safety precautions to avoid injuries
    - (ii) Be prepared to provide wound care for longer period
    - (iii) Teach home caregivers wound care techniques
- (2) Malnutrition
  - (a) Physiological Effects
    - (i) All phases of wound healing are impaired
    - (ii) Stress from burns or severe trauma increases nutritional requirements
  - (b) Interventions
    - (i) Provide balanced diet rich in protein, carbohydrates, lipids, vitamins A and C, and minerals
- (3) Obesity
  - (a) Physiological Effects
    - (i) Fatty tissue lacks adequate blood supply to resist bacterial infection and deliver nutrients and cellular elements
  - (b) Interventions

- (i) Observe obese patient for signs of wound infection, dehiscence, and evisceration
- (4) Impaired oxygenation
  - (a) Physiological Effects
    - (i) Low arterial oxygen tension alters synthesis of collagen and formation of epithelial cells  
If local circulating blood flow is poor, tissues fail to receive needed oxygen
    - (ii) Decreased hemoglobin (anemia) reduces arterial oxygen levels in capillaries and interferes with tissue repair
  - (b) Interventions
    - (i) Diet adequate in iron
    - (ii) Monitor patients' hematocrit and hemoglobin levels
- (5) Smoking
  - (a) Physiological Effects
    - (i) Reduces the amount of functional hemoglobin in blood, thus decreasing tissue oxygenation
    - (ii) May increase platelet aggregation and cause hypercoagulability
    - (iii) Interferes with normal cellular mechanisms that promote release of oxygen to tissue
  - (b) Interventions
    - (i) Discourage patient from smoking by explaining its effects on wound healing
- (6) Presence of infection
- (7) Drugs
  - (a) Physiological Effects
    - (i) Steroids reduce inflammatory response
    - (ii) Anti-inflammatory drugs suppress protein synthesis, wound contraction, epithelialization, and inflammation
    - (iii) Prolonged antibiotic use may increase risk of superinfection
    - (iv) Chemotherapeutic drugs can depress bone marrow function, number of leukocytes, and inflammatory response
  - (b) Interventions
    - (i) Carefully observe patient; signs of inflammation may not be obvious
- (8) Chronic diseases that interfere with oxygenation and transport of nutrients
  - (a) Physiological Effects



- (i) Chronic disease causes small blood vessel disease that impairs tissue perfusion
- (ii) Diabetes causes hemoglobin to have greater affinity for oxygen, so it fails to release oxygen to tissues
- (iii) Hyperglycemia alters ability of leukocytes to perform phagocytosis and also supports overgrowth of fungal and yeast infection
- (b) Interventions
  - (i) Instruct patient to take preventive measures to avoid cuts or breaks in skin
  - (ii) Provide preventive foot care
  - (iii) Control blood sugar to reduce the physiological changes associated with diabetes

**Assessment considerations**

**Obtain history of wound injury**

- (1) How did the wound occur?
- (2) What type of object caused the injury?
- (3) When did the wound occur?
- (4) Color
  - (a) Pink - usually indicates healthy tissue
  - (b) Black - indicates poor tissue perfusion, necrosis
  - (c) Red - indicates infection
- (5) Odor - a foul smell indicates presence of bacteria
- (6) Wound size –
  - (a) Measure wound from side to side at largest point
  - (b) Take second measurement perpendicular to first
  - (c) Document both measurement (i.e., "1" by "3"), or by using commonly-known object, such as "dime-sized" wound
- (7) Wound boundaries - edges of wound smooth or irregular
- (8) Drainage
  - (a) Color
  - (b) Quantity
  - (c) Consistency (watery, thick, etc.)
  - (d) Odor

**Neurovascular status of the affected extremity MUST be assessed prior to wound treatment**

- (1) Pulse quality, location, rate
- (2) Capillary refill
- (3) Skin color/temperature
- (4) Sensation/Motor function

**Assess the wound**

- (1) Contusion
  - (a) Assess for depth of hematoma
  - (b) Identify damage to underlying vessels, nerves and bony structures

- (c) Assess peripheral pulses
  - (d) Assess sensation
  - (e) Assess motor function and strength
  - (f) Assess for pain control
  - (g) Assess tetanus prophylaxis status
- (2) Crush injury
- (a) Assess for wound depth and blood loss
  - (b) Assess for neurovascular status:
    - (i) Pulse quality, location, rate
    - (ii) Capillary refill
    - (iii) Skin color
    - (iv) Level of consciousness
  - (c) Assess for pain control
  - (d) Assess tetanus prophylaxis status
- (3) Abrasion
- (a) Assess for amount of fluid loss in large wounds
  - (b) Assess functional capabilities
  - (c) Assess for pain control
  - (d) Assess tetanus prophylaxis status
- (4) Laceration
- (a) Assess age and depth
  - (b) Assess degree and/or type of contamination
  - (c) Assess for associated injuries
  - (d) Assess neurovascular status of affected extremity as appropriate:
    - (i) Pulse quality, location, rate
    - (ii) Capillary refill
    - (iii) Skin color/temperature
    - (iv) Sensation/motor function
  - (e) Assess for pain control
  - (f) Assess tetanus prophylaxis status
- (5) Avulsion
- (a) Assess amount of tissue and functional loss
  - (b) Assess depth of injury
  - (c) Assess for pain control
  - (d) Assess for tetanus prophylaxis status
- (6) Amputations
- (a) Assess for blood loss and bleeding source
  - (b) Assess neurovascular status:
    - (i) Pulse quality, location, rate
    - (ii) Capillary refill
    - (iii) Skin color/temperature
    - (iv) Sensation/motor function
  - (c) Assess for pain control
  - (d) Assess for tetanus prophylaxis status
- (7) Punctures/ penetrations
- (a) Assess for presence of foreign bodies/materials and impaled objects
  - (b) Assess depth of penetration for underlying structural damage

- (c) Assess type/degree of contamination
- (d) Assess for pain control
- (e) Assess for tetanus prophylaxis status

**Emergency treatment of specific wound types**

**General treatment**

- (1) Life-threatening injuries are managed prior to isolated wounds:  
Assess for and treat any existing critical injuries
  - (a) Airway
  - (b) Breathing
  - (c) Circulation
- (2) Wound categories
  - (a) Penetrating chest wounds
  - (b) Impaled or open abdominal wounds
  - (c) Amputations
  - (4) Avulsions
  - (5) Crush injury
- (3) Expose area
- (4) Stop the bleeding
- (5) Maintain intravenous access and fluids for significant blood loss or severe underlying structure damage: Treat for shock as necessary
- (6) Assess for neurovascular status:
  - (a) Pulse quality, location, rate
  - (b) Capillary refill
  - (c) Skin color/temperature
  - (d) Sensation/motor function
- (7) Emergency treatment of specific wounds
  - (a) Cleanse wound to decrease contamination
  - (b) Prevent dehydration of wound by covering wound with sterile dressing
- (8) Assess and apply appropriate type of dressing and splints
- (9) Assess activity restrictions
- (10) Provide pain relief management
  - (a) Apply ice packs
  - (b) Administer medication

**Specific treatment**

- (1) Contusion
  - (a) Elevate contused area or extremity
  - (b) Apply ice pack within first 24 hrs
- (2) Crush injury
  - (a) Control bleeding
    - (i) Direct pressure
    - (ii) Pressure dressing
  - (b) Apply dry, sterile dressing
  - (c) Elevate extremity, if possible
  - (d) Administer antibiotics as directed and tetanus
- (3) Abrasion

- (a) Cleanse wounds thoroughly by scrubbing with normal saline
  - (b) Remove debris and foreign bodies with soaked sponge or irrigation
  - (c) Apply antibiotic ointment
  - (d) Leave wound uncovered or covered with a nonadherent dressing
- (4) Laceration
- (a) Control bleeding with direct pressure
  - (b) Cleanse and irrigate thoroughly
  - (c) Wound closure by skin sutures, staples or steri-strips
    - (i) Sutures - thread, wire or other materials used to sew body tissues together
      - \* Placed within tissue layers in deep wounds and superficially as the final means for wound closure
      - \* Deeper sutures are usually made of material that will be absorbed by the body in several days
      - \* Types: Interrupted or separate, continuous, blanket, retention suture covered with rubber tubing to provide greater strength
    - (i) Staples
      - \* Provides quick closure
      - \* Usually less costly
      - \* Limited to areas of less cosmetic importance such as scalp or trunk
      - \* Removal of staples requires a sterile staple extractor and maintenance of aseptic technique
- (5) Avulsion
- (a) Control bleeding by direct pressure
  - (b) Cleanse thoroughly
  - (c) Cover wound with ointment, sterile dressing, and splints
- (6) Amputations
- (a) Control bleeding with direct pressure, pressure points and elevation
    - (i) Apply tourniquet if above measures are not successful
  - (b) Apply moist, sterile dressing over amputation stump
  - (c) Wrap amputated body part in moist, sterile dressing; place in plastic bag and place over ice
- (7) Punctures/ penetrations
- (a) Secure any impaled objects
  - (b) Soak the wound in warm solution for several minutes
  - (c) Provide care of drains, if present
  - (d) Administer antibiotics as directed and tetanus

**Care for a wound**

**Types of dressing**

- (1) Gauze dressing
  - (a) Permit air to reach the wound
  - (b) Sterile dressings
- (2) Semiocclusive dressing
  - (a) Permit oxygen but not air to pass
  - (b) Thought to promote healing by keeping wounds moist (yet sterile) so epithelial cells can slide more easily over the surface of the wound
- (3) Occlusive dressing
  - (a) Permit neither oxygen or air to pass
  - (b) Thought to promote healing by keeping wounds moist (yet sterile) so epithelial cells can slide more easily over the surface of the wound
  - (c) Tape strips are placed on all sides of the dressing

**Changing of dressing**

- (1) Dressings are changed per doctor's orders, when the wound requires assessment or care, and when they become loose or saturated with drainage
- (2) Supplies and equipment needed
  - (a) Waterproof bed pads
  - (b) Sterile dressings
  - (c) Plastic bag or basin
  - (d) Sterile saline or water
  - (e) Irrigation pack and solution
  - (f) Eye shield or face guard
  - (g) Sterile and clean gloves
  - (h) Tape or Montgomery straps
- (3) Explain procedure to patient
  - (a) Gather supplies and wash hands
  - (b) Position the patient and expose the area to be redressed
  - (c) Place waterproof pad under patient and prepare plastic bag as receptacle
  - (d) Put on clean non-sterile exam gloves
  - (e) Gently loosen tape toward the wound while supporting the skin around the wound or untie Montgomery straps
  - (f) Remove the dressing, being careful not to tear the wound or dislodge any drains. Use sterile saline to moisten dressing if it is sticking to the wound, to prevent discomfort to the patient and/or to maintain integrity of sutures.
  - (g) Assess amount, color, odor, and consistency of drainage
  - (h) Remove gloves and dispose in plastic bag
  - (i) Establish a sterile field. Open all sterile equipment and supplies and place within the sterile field. Uncap sterile saline or other solution as ordered
  - (j) Put on sterile gloves

**Cleansing the wound**

- (1) Linear wound
  - (a) First stroke - cleanse the area directly over the wound by wiping from the top to bottom. Discard the gauze.
  - (b) Second stroke - cleanse the skin area on one side next to the wound, wiping from top to bottom. Discard the gauze.
  - (c) Third stroke - cleanse the skin on other side of wound, wiping from top to bottom. Discard the gauze.
  - (d) Continue this procedure alternating sides of the wound, working away from the wound until clean.
- (2) Circular wound
  - (a) First stroke - starting at the center of the wound, wipe the wound area with an outward spiral motion. Do not use the same swab/gauze to clean the entire wound
  - (b) Continue this procedure, working outward until wound is clean. Do not cross back to the center of wound.

**Irrigate the wound**

- (1) Put on sterile gloves and eye shield or face guard, if available
- (2) To prevent contamination and to clean the bottle rim, pour a small amount of the liquid into waste receptacle. If the seal of the bottle has not been broken, this step is not necessary
- (3) Pour irrigating solution into basin with the label facing the palm
- (4) Fill the syringe with solution from the sterile basin

**CAUTION:** If Betadine (iodine) is being used, check to ensure patient does not have allergies to the iodine. An alternate, non-iodine-based solution may be used (Hibiclens, phisoex, hydrogen peroxide).

- (5) Hold the tip of the syringe just above top end of wound and force fluid into the wound slowly and continuously. Use enough force to flush out debris but do not squirt or splash fluid
- (6) Irrigate all portions of the wound. DO NOT force solution into wound pockets. Continue irrigating until solution draining from bottom end of wound is clear
- (7) Using sterile gauze, gently pat dry the edges of the wound. Work from cleanest to most contaminated areas

**Apply a sterile dressing**

- (1) Lay inner dressing over wound ensuring the dressing extends past the edge of the wound
- (2) All other dressings will overlap each other and cover entire wound
- (3) Cover all inner dressings with a large out dressing

**CAUTION:** Some wounds must be kept moist, and will require the use of "wet to dry" dressings. The inner dressings that touch the wound directly will be dampened with a solution (usually normal saline) before application. The outer dressings are applied dry. Example: abdominal evisceration.

**WARNING:** During combat conditions, the medic will NOT remove an existing dressing but will only reinforce with additional dressings. Label the dressing "REINFORCED." Write date, time and your initials.

- (4) Remove gloves and place in disposal bag
- (5) Tape the dressing or tie Montgomery straps

**CAUTION:** Tape should not form a constricting band around the wound or extremity.

- (6) Reposition and cover patient
- (7) Close and dispose of plastic bag with used supplies IAW local policy
- (8) Wash hands
- (9) Document wound care and all assessments on the appropriate form
  - (a) Enter the date and time of the procedure
  - (b) Enter a description of the wound's color, odor, consistency, and amount of drainage

#### **Drainage and drainage systems**

##### Wound drainage

- (1) Exudate –fluid, cells or other substances that have slowly exuded or discharged from cells or blood vessels through small pores or breaks in cell membrane
- (2) Drainage – the removal of fluids from a body cavity, wound, or other source of discharge by one or more methods
- (3) Types
  - (a) Serous
    - (i) Clear, watery fluid that has been separated from its solid elements (e.g., the exudate from a blister)
    - (ii) Serous fluid has characteristics of serum
    - (iii) Serum is clear, thin, sticky fluid portion of blood that remains after coagulation
  - (b) Sanguineous
    - (i) Fluid contains blood
  - (c) Serosanguineous
    - (i) Thin and red, described as pink
- (4) Exudate/drainage greater than 300 ml in the first 24 hours should be treated as abnormal
- (5) When patients first ambulate, a slight increase may occur
- (6) If sanguineous drainage continues, small blood vessels may be oozing
- (7) Not all surgical wounds drain, the following characteristics are important to note and chart:
  - (a) Color
  - (b) Amount
  - (c) Consistency (thick/thin)
  - (d) Odor

#### **Wound drainage systems**

- (1) Open drainage
  - (a) Drainage that passes through an open-ended tube into a receptacle or out onto the dressing

- (b) Penrose drain is a soft tube that may be „advanced“ or pulled out in stages as the wound heals from the inside out
- (2) Closed / Suction drainage
  - (a) Self-contained suction units that connects to drainage tubes within the wound
  - (b) Removes fluid in an airtight circuit
  - (c) Prevents environmental contaminants from entering the wound or cavity
  - (d) Two types of drainage devices that are portable and provide constant low-pressure suction to remove and collect drainage without wall suction
    - (i) Jackson-Pratt drain – used when small amounts (100 –200 ml) of drainage is anticipated
    - (ii) Hemovac drainage system used for larger amounts (up to 500 ml) of drainage

***Assist with on-going casualty management***

**Evaluation of wound healing**

- (1) Checked after:
  - (a) Each dressing change
  - (b) Application of heat and cold therapies
  - (c) Wound irrigation
  - (d) Stress to the wound site
- (2) Evaluation measures
  - (a) Assess condition of the wound
  - (b) Ask whether patient notes any discomfort during procedure
  - (c) Inspect condition of dressings at least every shift
- (3) Documentation: minimal characteristics in every wound evaluation
  - (a) Location
  - (b) Size
  - (c) Drainage color
  - (d) Amount
  - (e) Consistency (thick/thin)
  - (f) Odor
  - (g) NV Status

**Continuing Assessment**

- (1) Monitor vital signs
- (2) Monitor distal peripheral pulses
- (3) Monitor skin color, sensation and temperature
- (4) Monitor motor function
- (5) Monitor IV fluids
- (6) Provide pain control
- (7) Monitor for compartment syndrome
  - (a) Pain
  - (b) Firmness of muscle compartment
- (c) Paresthesia
- (8) Evacuate to next echelon of care for further medical treatment as indicated



**Wound complications**

- (1) Impaired wound healing
  - (a) Accurate observation
  - (b) Ongoing interventions
- (2) Terms associated with wound complications
  - (a) Abscess – Cavity containing pus and surrounded by inflamed tissue, formed as a result of suppuration in a localized infection
  - (b) Adhesion – Band of scar tissue that binds together two anatomical surface normally separated; most commonly found in the abdomen
  - (c) Cellulitis – Infection of the skin characterized by heat, pain, erythema, and edema
  - (d) Dehiscence – Separation of a surgical incision or rupture of a wound closure
  - (e) Evisceration – Protrusion of an internal organ through a wound or surgical incision
  - (f) Extravasation – Passage or escape into the tissues; usually of blood, serum, or lymph
  - (g) Hematoma – Collection of extravasate blood trapped in the tissues or in an organ resulting from incomplete hemostasis after surgery
- (3) Wound bleeding may indicate a slipped suture, dislodged clot, coagulation problem, or trauma placed on blood vessels or tissues
- (4) Inspection of the wound and dressing aids in detecting increase drainage and color changes
- (5) If bleeding occurs internally
  - (a) Dressing may remain dry while the abdominal cavity collects blood
  - (b) Patient will have increase thirst, restlessness, rapid, thready pulse, decreased blood pressure, decreased urinary output, and cool, clammy skin
  - (c) Abdomen will become rigid and distended
  - (d) If not detected, hypovolemic shock can cause circulatory system to collapse, causing death
- (6) Dehiscence – wound layers have separated
  - (a) Patient may say that something has ‘given way’
  - (b) May result after periods of sneezing, coughing, or vomiting
  - (c) Evidence of new or increased serosanguineous drainage on the dressing is an important sign to assess
  - (d) Management:
    - (i) Patient should remain in bed
    - (ii) Kept NPO
    - (iii) Told not to cough
    - (iv) Always reassure patient
    - (v) Place sterile dressing over area until physician evaluates the site
- (7) Evisceration – abdominal organs protrude through opened incision
  - (a) Patient is to remain in bed

- (b) Wound and contents should be covered up with warm, sterile saline dressings
  - (c) Surgeon is notified immediately – this is a medical emergency
- (8) Wound infection, or wound sepsis – results when the surgical wound becomes contaminated
- (a) CDC labels a wound infected when it contains purulent (pus) drainage
  - (b) Patient with an infected wound displays a fever, tenderness and pain at the wound, edema, and an elevated WBC
  - (c) Purulent drainage has an odor and is brown, yellow or green, depending on the pathogen

## **TERMINAL LEARNING OBJECTIVE**

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward.

### ***Suctioning Techniques***

#### **Suctioning**

**Used to clear the airway of excessive secretions when the patient is unable to clear the respiratory tract with coughing.**

#### **Signs and symptoms of excess secretions**

- (1) Assess oral cavity: gurgling noise on inspiration or expiration, obvious oral secretions, drooling, gastric secretions or vomitus in mouth, and productive cough without expectorating secretions from the mouth.
- (2) Assess for lower airway obstruction: coughing, secretions in the airway, labored breathing, restlessness or irritability, unilateral breath sounds, cyanosis, decreased oxygen saturations or level of consciousness, increased fatigue, dizziness, increased pulse rate, increased respiratory rate and/or elevated blood pressure.

#### **Assess lung sounds**

Auscultating all lung fields for adventitious sounds such as rhonchi, rales and or wheezing.

#### **Assess the patient's understanding of the procedure**

Remove excess secretions by one of the primary suctioning techniques.

#### **Three primary suctioning techniques**

- (1) Oropharyngeal suctioning-used when the patient is able to cough effectively but is unable to clear secretions by expectorating or swallowing.
- (2) Nasotracheal suctioning-necessary when the patient with pulmonary secretions is unable to cough and does not have an artificial airway.
- (3) Tracheal suctioning-accomplished through an artificial airway. The artificial airway may be an endotracheal or nasotracheal tube or it may be a tracheostomy tube.

#### **Preparation for all techniques/types of suctioning**

- (1) Verify MD/PA order as required for procedure. Some hospitals require a physicians order to suction the trachea
- (2) Explain the procedure to the patient and the reason that it is to be done. Explain how the procedure will help clear the airway and relieve breathing problems and that temporary coughing, sneezing, gagging, or shortness of breath is normal.
- (3) Gather equipment necessary to correctly perform the procedure. Some facilities have commercially prepared suctioning kits. Check what is available in your facility or check procedural manuals for equipment lists.

- (4) Don gloves (nonsterile) and use mask or face shield as per local policy
- (5) Fill basin or cup with approximately 100 cc of water
- (6) Connect one end of connecting tubing to suction machine. Check that equipment is functioning properly by suctioning a small amount of water from basin
- (7) Turn on suction device. Set regulator to appropriate negative pressure: wall suction, 80-120 mm Hg; portable suction, 7-15 mm Hg for adults

**NOTE:** Elevated pressure settings increase risk of trauma to mucosa

**Oropharyngeal suctioning**

- (1) Attach suction catheter to connecting tubing. Remove oxygen mask from patient if present. Nasal cannula or prongs may be left in place while performing this type of suctioning.
- (2) Assist the patient to assume comfortable position for the procedure. Usually this will be a semi-Fowler's position or sitting upright. Proper positioning reduces stimulation of the gag reflex, promotes patient comfort and aids in secretion drainage.
- (3) Insert catheter into patient's mouth. With suction applied, move the catheter around the mouth, including the pharynx and the gum line until secretions are cleared. If the catheter does not have a suction control to apply intermittent suction, take care not to traumatize oral mucosal surfaces with continuous suctioning.

**NOTE:** Oropharyngeal suctioning is usually performed using a rigid plastic catheter with one large and several small eyelets that mucous enters when suction is applied. This type of catheter is called a Yankauer or tonsil suctioning device. Alert patients can be taught to use this device to control excess secretions in the mouth.

- (1) Encourage the patient to cough. Coughing moves secretions from the lower and upper airway into the mouth where they can be easily suctioned.
- (2) Repeat suctioning as needed until the mouth is clear of excess secretions.
- (3) Replace the oxygen mask if removed earlier.
- (4) Suction water from the basin through the catheter until the catheter is cleared of secretions. Clearing secretions from the catheter and the tubing before they dry reduces the possibility of transmission of microorganisms and insures delivery of accurate suction pressures.
- (5) Place the catheter in a clean, dry area for reuse with the suction turned off. If the patient has been taught to use the suction catheter, leave the suction on and the catheter within reach of the patient.
- (6) Dispose of water and clean the basin as per policy. Remove your gloves and dispose of per local policy.

#### **Nasotracheal suctioning**

- (1) Open suction kit or catheter using aseptic technique. If sterile drape is available, place it across the patient's chest. Do not allow the suction catheter to touch any non sterile surfaces
- (2) Unwrap or open a sterile basin and place on the bedside table. Be careful not touch the inside of the sterile basin. Fill the basin with approximately 100 cc of sterile Normal Saline (NS).
- (3) Apply one sterile glove to each hand, or apply non sterile glove to nondominant hand and sterile glove to dominant hand. Attach non sterile suction tubing to sterile catheter, keeping hand holding catheter sterile.
- (4) Secure catheter to tubing aseptically. Coat distal 2-3 inches of catheter with water-soluble lubricant (K-Y Jelly/Lubricant).
- (5) Remove oxygen delivery device, if present, with nondominant hand. **Without applying suction** and using the dominant thumb and forefinger, gently, but quickly insert the sterile catheter into either naris during inhalation with a slight downward slant. Do not force the catheter. Try the other naris if insertion meets resistance or is difficult to insert.

**NOTE: Never apply suction during insertion.** Application of suction pressure while introducing the catheter into the trachea increases risk of damage to the mucosa and increases the risk of hypoxia because the removal of oxygen present in the airway. Remember that the epiglottis is open during inspiration and facilitates insertion of the catheter into the trachea.

- (6) Insert the catheter approximately 16-20 cm (6 ½-8 inches) in the adult patient. One method of measuring the correct length of catheter to insert is to use the distance from the patient's nose to the base of the earlobe as a guide.
- (7) Apply intermittent suction by placing and releasing nondominant thumb over the vent of catheter. Slowly withdraw the catheter while rotating it back and forth with suction on for as long as 10-15 seconds.
- (8) Assess the need to repeat suctioning procedure. Allow adequate time between suction passes for ventilation and oxygenation. Ask the patient to deep breathe and cough. Keep oxygen readily available in case the patient exhibits signs of hypoxemia. Administer oxygen to the patient between suctioning attempts
- (9) When the pharynx and trachea are cleared of secretions, perform oral suctioning to clear the mouth of secretions. Do not suction the nose or trachea after suctioning the mouth.
- (10) Rinse the catheter and connecting tubing by suctioning NS from the basin until the tubing is clear. Dispose of equipment as per facility policy. Turn off suction device

#### **Endotracheal or tracheostomy tube suctioning**

- (1) Performed through an artificial airway (endotracheal/nasotracheal or tracheostomy). Artificial airways are indicated for patients with decreased level of consciousness, airway obstruction, mechanical

- ventilation and for removal of tracheal bronchial secretions. Artificial airways allow easy access to the patient's trachea for deep tracheal suctioning.
- (2) Prepare suction equipment, suction catheter using sterile technique and don sterile gloves as previously described for nasotracheal suctioning
  - (3) Hyper oxygenate the patient before suctioning, using manual resuscitation Ambu-bag connected to an oxygen source.
  - (4) Open swivel adapter or if necessary remove the oxygen delivery device (ventilator tubing) with your nondominant hand.
  - (5) **Without applying suction**, gently, but quickly insert the sterile catheter using the dominant thumb and forefinger into the artificial airway until resistance is met, or the patient coughs and then pull back the catheter approximately ½ inch.
  - (6) Apply intermittent suction by placing and releasing nondominant thumb over the vent of the catheter while rotating it back and forth between the dominant thumb and forefinger. Encourage the patient to cough, if possible. Observe continuously for respiratory distress.

**NOTE:** If the patient develops respiratory distress during the suctioning procedure, immediately withdraw the catheter and administer additional oxygen and breaths as needed.

- (7) Close the swivel adapter, or replace the oxygen delivery device (ventilator tubing).
- (8) Rinse catheter and tubing with NS
- (9) Assess for secretion clearance. Repeat suctioning procedure 1-2 times more to clear secretions if necessary. Allow adequate time between suction passes (at least one full minute) for ventilation and oxygenation.
- (10) Perform oropharyngeal suctioning as needed. Catheter is now contaminated. **Do not** reinsert into the artificial airway.
- (11) Dispose of suctioning equipment per policy. Turn off suction device
- (14) Reposition the patient as indicated by condition

**Record-**

The amount, consistency, color and any odor of secretions and the patient's response to the procedure. Document the patient's pre- and post suctioning respiratory status.

**Continue to monitor patient's vital signs**

Include pulse oximetry if available.

**Perform Endotracheal Tube and Tracheostomy Care**

**Artificial airways**

Place the patient at high risk for infection and make the patient more susceptible to airway injury.

### **Endotracheal (ET) tubes**

Used as short-term artificial airways and are used to administer mechanical ventilation, relieve upper airway obstruction, and protect the patient from aspiration or clear excessive secretions. ET tubes may be placed either nasally or orally. They are generally removed within 14 days.

Patients who require artificial airway assistance for longer than 14 days usually require a tracheostomy. This procedure involves a surgical incision to be made into the trachea and a short, artificial airway (trach tube) is inserted. This procedure is normally accomplished in the operating room under sterile conditions.

### **Endotracheal (ET) tube care**

- (1) Verify MD/PA order as required by facility
- (2) Explain the procedure to the patient and reason it is being done in terms the patient understands
- (3) Gather equipment necessary to perform the procedure
- (4) Initiate and perform endotracheal suctioning prior to the procedure. This allows for the removal of secretion and diminishes the patient's need to cough during the procedure.
- (5) Connect oral suction catheter (Yankauer) suction to suction device
- (6) Prepare tape. Cut piece of tape long enough to go completely around the patient's head from nares to nares (nasal ET tube) or from edge of mouth to edge of mouth (for oral ET tube) plus approximately 6 inches. Lay adhesive side up on table and cut and lay approximately 6 inches of tape, adhesive side down, in the center of the long strip. This will prevent the longer piece of tape from sticking to the patient's skin and hair on the back of the head/neck.
- (7) Carefully remove tape from the ET tube and the patient's face. An assistant may be required to help hold the ET tube in place so that the tube does not move. This is especially important in an uncooperative patient.
- (8) Remove excess adhesive from the face with adhesive remover if necessary.
- (9) Remove bite block or oral airway if present
- (10) Clean mouth, gums and teeth with NS or mouthwash solution and a 4 X 4 gauze, sponge tipped applicator or saline swabs. Brush teeth if necessary and suction oral cavity with Yankauer suction.
- (11) Clean face and neck with soap and water. Shave the make client as necessary.
- (12) Apply tincture of benzoin to the upper lip (oral ET tube) or across nose (nasal ET tube) and cheeks to ears. Allow to dry completely.
- (13) Slip tape under the patient's head and neck, adhesive side down. Do not twist tape or catch hair. Do not allow tape to stick to itself. Center tape so that the double-faced tape extends around the back of the neck from ear to ear.
- (14) On one side of the face, secure tape from ear to nares (nasal ET tube) or edge of mouth (oral ET tube). Tear remaining tape in half, length wise, forming two pieces that are  $\frac{1}{2}$  to  $\frac{3}{4}$  inch wide. Secure

- bottom half of tape across upper lip (oral ET tube) or across top of nose (nasal ET tube). Wrap top half around the ET tube.
- (15) Gently pull other side of tape firmly to pick up slack and secure to remaining side of face.
  - (16) Clean oral airway in warm soapy water and rinse well. Hydrogen peroxide can aid in the removal of crusty secretions.
  - (14) Reinsert oral airway being careful not to push the tongue into the oropharynx

#### **Tacheostomy Care**

- (1) Suction trach. Suctioning prior to the procedure removes secretions so that they do not occlude the outer cannula while the inner cannula is removed. Reduces the need for the patient to cough during the procedure.
- (2) Open sterile trach care kit (commercially available). Open three 4 X 4 sterile gauze packages using aseptic technique and pour NS on one package and hydrogen peroxide on another. Leave the third package dry.
- (3) Open two packages of cotton tipped swabs and pour NS on one package and hydrogen peroxide on the other.
- (4) Open sterile trach package. Unwrap sterile basin and pour about 1 inch of hydrogen peroxide into it. Open small sterile brush package and place aseptically into the basin.
- (5) Measure and cut twill trach tape long enough to around the patient's neck two times (approximately 24-30 inches. Cut ends on a diagonal. Lay aside in a dry area.
- (6) Don sterile gloves. Keep dominant hand sterile throughout the procedure.
- (7) Remove oxygen source/ventilator tubing.
- (8) Remove inner cannula of trach with a slight twisting motion with the nondominant hand and drop the cannula into the hydrogen peroxide basin
- (9) Place oxygen source over or near the outer cannula. Oxygen delivery tubing cannot be attached to all outer cannulas when the inner cannula is removed.
- (10) Quickly clean the inner cannula with the brush to remove secretions inside and outside the cannula. Rinse with NS, using the nondominant hand to pour.
- (11) Replace the inner cannula and secure the locking mechanism with a slight twisting motion. Reapply the oxygen/ventilator source.
- (12) Using hydrogen peroxide prepared cotton-tipped swabs and 4 X 4 gauze, clean the outer cannula surfaces and stoma under the faceplate of the trach tube, extending 2-4 inches in all directions from the stoma. Clean in a circular motion from stoma site outward. Always remember to use the dominant hand to handle sterile supplies
- (13) Using NS prepared cotton-tipped swabs and 4 X 4 gauze, rinse hydrogen peroxide from the trach tube and skin.
- (14) Using dry 4 X 4 gauze, pat dry the outer cannula and skin surfaces.



- (15) Replace trach tie. If assistant available, have them hold the trach in place while old tie is cut and removed and new tie is applied. If no assistant is available, apply new tie before removing the old one.
- (16) To replace the trach tie, insert one end of the tie through faceplate eyelet and pull ends even
- (17) Slide both ends of behind the head and around the neck to the other eyelet and insert one tie through the second eyelet.
- (18) Pull snug
- (19) Tie ends securely in a double square knot, allowing space for only one finger in tie
- (20) Insert fresh trach dressing under clean ties and faceplate.
- (21) Assist patient to position of comfort and assess respiratory status.

**Record respiratory assessments before and after care.**

**Record ET tube care-**

Include frequency and extent of care, patient response to care and any abnormal findings to include skin breakdown/irritation.

**Record tracheostomy care-**

Note size of trach tube, frequency and extent of care, patient tolerance of care and any abnormal findings to include signs of an infected stoma (increased redness, purulent drainage), skin breakdown/irritation.

**Continue to monitor patient's vital signs-**

Include pulse oximetry, if available.

**Administer a nebulization treatment**

**Nebulization**

Process of adding moisture or medications to inspired air by mixing particles of varying size using compressed air or oxygen.

**Nebulizer-**

Uses the aerosol principle to suspend a maximum number of water drops or particles of the desired size in inspired air.

**Nebulization-**

Often used for the administration of bronchodilator in the treatment of asthma

**Administer a nebulization treatment**

- (1) Verify MD/PA order for treatment
- (2) Verify patient's allergies to medications
- (3) Prepare medication. Usually administer a bronchodilator such as albuterol, 0.2-0.3 ml in 3cc normal saline (NS). This medication is often available in unit dose packages. Check with facility for what is available.
- (4) Assemble nebulizer as directed. Nebulizers are now pre-packaged, disposable systems for individual patient use.

- (5) Place medication and NS into receptacle and screw lid onto medication receptacle. Attach the mouthpiece to the receptacle and attach the reservoir tubing to the other end.
- (6) Connect the nebulizer to the compressed air or oxygen source. Oxygen is usually used to administer a nebulization treatment to a patient having an acute asthmatic attack.
- (7) Turn on the compressed air/oxygen until you observe a fine mist coming from the mouthpiece of the nebulizer. This usually requires at least 10-12 LPM of the compressed air/oxygen.
- (8) Have the patient place the mouthpiece in their mouth and close their lips around the mouthpiece.
- (9) Patient should inhale the medication as deeply as possible and exhale through the nebulizer. The patient does not need to remove the nebulizer from their mouth to exhale. Make sure the patient does not hyperventilate nor hold his breath.
- (10) The treatment should last 5-10 minutes.
- (11) Upon completion of the treatment, turn off the compressed air/oxygen.
- (12) Assess the respiratory status of the patient by auscultating the lungs
- (13) Monitor vital signs to include pulse oximetry if available
- (14) Document the treatment to include time, medication, deliver system and patient's response to treatment.

### TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward, perform basic nursing care IAW Advanced Cardiac Life Support, Emergency Medicine, Nursing Interventions and Clinical Skills.

#### **Basic Cardiac Monitoring** **Electrocardiogram (ECG)**

- (1) Graphic record of heart's electrical activity
- (2) Body acts a conductor of electricity and the heart is the largest generator of electrical energy
- (3) Electrodes placed on the skin can detect total electrical activity within the heart
- (4) Electrical impulses on the skin surface have very low voltage. The ECG machine amplifies these impulses and records them on the ECG graph paper or on a monitor screen called an oscilloscope.
- (5) Positive impulses appear as "upward" deflections on the graph paper or monitor screen
- (6) Negative impulses appear as "downward" deflection on the graph paper or monitor screen
- (7) Absence of any electrical impulse produces an isoelectric or "flat" line
- (8) "Artifacts" are deflections the ECG produced by factors other than the electrical activity of the heart. Common causes are:
  - (a) Muscle tremors
  - (b) Shivering
  - (c) Patient movement
  - (d) Loose electrodes
  - (e) 60 cycle interference
  - (f) Machine malfunction
- (9) Eliminate all artifacts before attempting to record an ECG
  - (a) Replace loose electrodes
  - (b) Cover patient with a blanket to prevent shivering
  - (c) Wipe oily skin or diaphoretic skin with alcohol and then attach leads to increase adherence to the skin

#### **ECG Leads**

- (1) Monitors heart's electrical activity by monitoring voltage change through electrodes placed at various places on the body surface
- (2) Each pair of electrodes is called a "lead"
- (3) Basic cardiac monitoring uses only 3 leads
- (4) Three types of ECG leads are:
  - (a) Bipolar
  - (b) Augmented
  - (c) Precordial
- (5) Bipolar leads are the most frequently used and have one positive electrode and one negative electrode

- (6) Leads I, II and III commonly called limb leads are bipolar and are the most frequently used leads in basic cardiac monitoring

**NOTE:** In the definitive care facility, 12 leads are normally used to detect a variety of conduction abnormalities, to include the presence and location of a myocardial infarction. This technique requires the use of augmented limb leads and precordial leads and allows the examination of the heart in two planes.

- (7) Bipolar leads provide only three views of the heart's electrical activity, which is adequate for detecting life-threatening dysrhythmias

#### **Routine ECG Monitoring**

- (1) Routine ECG monitoring generally uses only one lead  
(2) Most commonly monitored leads are either Lead II or the modified chest lead 1 (MCL1),  
(3) Lead II is used more frequently because most of the heart's electrical current flows toward its positive axis. This lead gives the best view of the ECG waves and best shows the heart's conduction system's activity.

**NOTE:** MCL is a special monitoring lead that some systems use selectively to help determine the origin of abnormal complexes such as premature beats.

#### **Lead Placement**

- (1) Electrodes are placed on the chest wall  
(2) Positive lead is placed at the apex of the heart-usually a few inches below the left nipple. Often the leads are marked for placement, RA (right arm), LA (left arm), etc.  
(3) The negative electrode is placed below the right clavicle  
(4) The third electrode, the ground, is placed somewhere on the left upper chest wall, usually below the left clavicle

#### **Advantages of single lead monitoring:**

- (1) Simple system  
(2) Provides rate of the heartbeat  
(3) Provides regularity of the heartbeat  
(4) Provides conduction time of the impulse through the heart  
(5) Detects life threatening dysrhythmias

#### **Disadvantages of single lead monitoring**

- (1) Does not provide the presence or location of an infarct  
(2) Does not provide right-to-left differences in conduction or impulse formation

- (3) Does not provide information on the quality or presence of pumping action

**Perform a 12 Lead ECG**

**Check equipment**

- (1) Ensure machine is turned on and allow ample time to warm up
- (2) Inspect machine for any malfunctions
- (3) Check machine's paper supply
- (4) Ensure all equipment is on hand
  - (a) Diskette
  - (b) Clean electrodes

**Gather information for Electrocardiogram Report**

- (1) Patient age
- (2) Patient sex
- (3) Race
- (4) Weight
- (5) Height
- (6) Signature of requesting MD/PA
- (7) Date and time of recording
- (8) Patient diagnosis or reason for recording
- (9) Current medications
- (10) Previous ECGs
- (11) Priority of processing
- (12) Patient identification
  - (a) Patient name and rank
  - (b) Social security number
  - (c) Company assignment if active duty
  - (d) Home phone number if retired

**Procedure for recording a standard 12-lead ECG**

- (1) Explain procedure to the patient
- (2) Select electrode sites
  - (a) Arms - anterior forearm and biceps
  - (b) Legs - medial aspect of lower leg
  - (c) Chest positions
    - (i) V1 - fourth intercostal space, right sternal
    - (ii) V2 - fourth intercostal space, left sternal
    - (iii) V3 - midway between V2 and V4
    - (iv) V4 - fifth intercostal space, midclavicular line
    - (v) V5 - same level as V4, anterior axillary line
    - (vi) V6 - same level as V4 and V5, midaxillary line
  - (d) Special cases of placement
    - (i) Amputees - place lead proximal to stump
    - (ii) Hairy skin surface - if hair is excessive, rub with alcohol

- (iii) Female - place lead under breast
  - (iv) Exceptionally oily skin - rub with alcohol
  - (v) Hard or scaly skin - rub with alcohol
  - (vi) Parkinson's disease
    - \* Place electrode high on limb
    - \* Elevating extremities in resting position may help control shaking
  - (vii) Skin rashes
    - \* Find area without a rash
    - \* If possible, rub with alcohol
  - (viii) Metal particles embedded in skin - move electrode site
- (3) Wipe selected area with alcohol before applying electrode
- (4) Application of electrodes
- (a) Ensure electrodes are not falling off patient
  - (b) Ensure patient cable is not twisted and not interfering with other leads
  - (c) Select flat, fleshy site on arms and legs, avoid bone
- (5) Press record ECG button
- (a) Remind patient to relax
  - (b) Check leads for contact
- (6) Recognize a good ECG
- (a) Sharp distinct baseline
  - (b) Free from artifact
  - (c) Centered on graph
- (7) Disconnect ECG
- (a) Disconnect patient
  - (b) Clean electrode surfaces as you remove them from the patient

**Identify general problems**

- (1) Muscle tremor
- (a) Causes
    - (i) Patient uncomfortable or cold
    - (ii) 60-cycle interference
  - (b) Correction
    - (i) Ensure patient comfort. Provide a cover if room is cold.
    - (ii) Ensure patient is not holding anything in their hand
    - (iii) Ensure feet are not touching the wall or foot board
- (2) 60-cycle interference
- (a) Causes
    - (i) Ungrounded electrocardiograph
    - (ii) Ungrounded electrical outlet
    - (iii) Ungrounded equipment that is connected to same electrical outlet
  - (b) Correction

- (i) Change electrical outlets
  - (ii) Change electrocardiograph, if possible
  - (iii) Notify MD/PA and medical maintenance
- (3) Wandering baseline
- (a) Causes
    - (i) Poor electrode contact
    - (ii) Cable pulling on electrodes
    - (iii) Cable moving with respirations
  - (b) Correction
    - (i) Check electrodes to ensure good contact
    - (ii) Adjust patient cable and move electrocardiograph closer to patient
    - (iii) Move cable off abdomen and guide under patient's arm to stabilize from moving

### **Right Side and Posterior ECG's**

**Right side and Posterior ECG's are recorded to aid the MD/PA in diagnosing the location of a myocardial infarction**

- (1) Explain the procedure to the patient
- (2) Select electrode sites
  - (a) Chest positions: V3R - 6R, are placed on the right side of the chest in the same locations as the Left side leads V3-6 would be placed. V2R is therefore the same as V1
    - (i) V1R - fourth intercostal space, left sternal border
    - (ii) V2R - fourth intercostal space, Right sternal border
    - (iii) V3R - midway between V2R and V4R
    - (iv) V4R - fifth intercostal space, midclavicular line
    - (v) V5R - same level as V4R, anterior axillary line
    - (vi) V6R - same level as V4R and V5R, midaxillary line
  - (b) All other preparation and clean up steps of the procedure remain the same as for standard 12-lead ECG

### **Posterior ECG's**

- (1) Explain the procedure to the patient
- (2) Select electrode sites
  - (a) Leads for a posterior ECG are placed in a horizontal line across the back
  - (b) Back Positions: May be done with standard left-side ECG - V7, 8, 9 or with Right-sided ECG - V7R, 8R, 9R
    - (i) V7 - Posterior axillary line
    - (ii) V8 - Posterior Scapular line
    - (iii) V9 - Left border of the spine
    - (iv) V7R - Right posterior axillary line
    - (v) V8R - Right posterior scapular line
    - (vi) V9R - Right border of the spine

- (c) All other preparation and clean up steps of the procedure remain the same as for standard 12-lead ECG

**Measure Pulse Oxygen Saturation**  
**Pulse oximetry defined**

- (1) Noninvasive measurement of arterial oxygen saturation
- (2) Assess level of oxygen in the blood available to the body tissues
- (3) Reflects percent of hemoglobin that is bound with oxygen in the arteries
- (4) Expressed as a percentage
  - (a) For example, 96% indicates 96% of the hemoglobin molecules are carrying oxygen molecules
  - (b) The more hemoglobin is saturated, the higher the percentage
  - (c) Normally over 90%
  - (d) An arterial blood gas (ABG) is an invasive procedure that may also be used to measure arterial oxygen saturation
- (5) Pulse oximetry is accurate to +/- 2% for all readings over 70%
- (6) Pulse oximetry is simple, painless, and has fewer risks than obtaining an ABG

**Pulse oximeter - how it works**

- (1) Probe with a light-emitting diode (LED) connected by cable to an oximeter
- (2) Light waves emitted by LED are absorbed and reflected back by oxygenated and deoxygenated hemoglobin molecules
- (3) Reflected light is processed by the oximeter, which calculated the arterial oxygen saturation
- (4) The oximeter sensor probe is applied to:
  - (a) Finger
  - (b) Toe
  - (c) Earlobe
  - (d) Bridge of the nose

**Considerations**

- (1) Patients at risk for unstable oxygen status
  - (a) Acute respiratory disease
  - (b) Chronic respiratory disease
  - (c) Ventilator dependence
  - (d) Chest pain
  - (e) Activity intolerance
  - (f) Recovery from general anesthesia
  - (g) Recovery from conscious sedation
  - (h) Traumatic injury to chest wall
  - (i) Changes in supplemental oxygen therapy
- (2) Medications or treatments that may influence oxygen saturation
  - (a) Oxygen therapy



- (b) Respiratory therapy
- (3) Factors that influence oxygen saturation - abnormalities in type of amount of hemoglobin affect the ability of oxygen to be carried to the tissues
- (4) Factors likely to interfere with accuracy of pulse oximeter
  - (a) Skin pigmentation - darker pigments can result in false-high readings
  - (b) Jaundice
  - (c) Intravascular dyes
- (5) Assess pertinent laboratory values, including hemoglobin and ABGs if available
  - (a) Anemia affects ability of oxygen to attach to hemoglobin molecule
  - (b) ABGs measure arterial oxygen saturation, which serves as a standard and provides a basis for comparison
- (6) Determine client-specific sit appropriate to place pulse oximeter probe by measuring capillary refill
  - (a) Site must have adequate circulation
  - (b) Moisture, dark nail polish, and acrylic nails impede sensor detection of emitted light and produce falsely elevated arterial oxygen saturation levels
- (7) Determine previous baseline from patient's records

**Application of pulse oximeter**

- (1) Select site and determine capillary refill
- (2) Attach sensor probe to selected site
- (3) Turn on oximeter
  - (a) Observe pulse waveform/intensity display
  - (b) Compare oximeter pulse rate with client's radial pulse
- (4) Once oximeter reaches constant value, read arterial oxygen saturation on display
- (5) Continually monitor arterial oxygen saturation levels
- (6) Notify MD/PA of drastic changes

## TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward. Performed basic nursing care for casualty without causing further injury or illness.

### **Chest Tube Systems**

#### **Pleur-Evac chest drainage system**

- (1) One-piece molded plastic unit that duplicates the three-bottle system
- (2) Cost effective
- (3) There must be bubbles flowing in the suction control portion of the unit to provide suction to the patient

#### **Pleur-Evac Set Up**

- (1) Fill water seal chamber
- (2) Fill suction control chamber
- (3) Attach tube to suction source
- (4) Tape all the connections
- (5) Provide sterile tube for connection to patient

#### **Procedure for Proper Usage of the Heimlich Valve**

- (1) Heimlich valve is a plastic, portable one-way valve used for chest drainage, draining into a vented bag
- (2) Equipment
  - (a) Heimlich valve
  - (b) Kelly clamps - 2 (rubber-tipped)
  - (c) Vented drainage bag or ostomy bag
  - (d) Ostomy tape or rubber band
  - (e) Suction setup (if applicable)
  - (f) Clean scissors
- (3) Procedure Steps
  - (a) Gather equipment and bring to patient area
  - (b) Wash hands
  - (c) Don gloves. Nonsterile gloves are acceptable as long as sterile technique is maintained while the connection is being made.
- (4) Heimlich Valve To Chest Tube
  - (a) Place rubber-tipped Kelly clamps in opposite directions on the proximal end of the chest tube as near to the patient as possible
  - (b) Connect the chest tube to the blue end of the Heimlich valve using sterile technique

**CAUTION:** Only the blue end of the Heimlich valve can be connected to the chest tube. If the clear end is connected, the one-way valve will be in the wrong position and no drainage will take place.

- (c) Tape the connection site at both ends of the valve using 2 inch cloth tape.

**CAUTION:** When two chest tubes are present, two Heimlich valves must be used to ensure proper functioning of chest tubes.

- (d) Monitor and record character of drainage and patency of valve in nursing progress notes.

**CAUTION:** Measure all drainage in a calibrated cylinder for accurate readings.

- (e) Record drainage output on I & O graphic every 8 hours. If conditions permit.

#### ***Care of patients with chest tubes***

**Assess patient for respiratory distress and chest pain, breath sounds over affected lung area, and stable vital signs**

**Observe for increase respiratory distress**

**Observe the following:**

- (1) Chest tube dressing, ensure tubing is patent
- (2) Tubing kinks, dependent loops or clots
- (3) Chest drainage system, which should be upright and below level of tube insertion

**Provide two shodded hemostats for each chest tube, attached to top of patient's bed with adhesive tape. Chest tubes are only clamped under specific circumstances:**

- (1) To assess air leak
- (2) To quickly empty or change collection bottle or chamber; performed by soldier medic who has received training in procedure
- (3) To change disposable systems; have new system ready to be connected before clamping tube so that transfer can be rapid and drainage system reestablished
- (4) To change a broken water-seal bottle in the event that no sterile solution container is available
- (5) To assess if patient is ready to have chest tube removed (which is done by physician's order); the soldier medic must monitor patient for recreation of pneumothorax

**Position the patient to permit optimal drainage**

- (1) Semi-Flower's position to evacuate air (pneumothorax)
- (2) High Flower's position to drain fluid (hemothorax)

**Maintain tube connection between chest and drainage tubes intact and taped**

- (1) Water-seal vent must be without occlusion
- (2) Suction-control chamber vent must be without occlusion when suction is used

**Coil excess tubing on mattress next to patient. Secure with rubber band and safety pin or system's clamp**

**Adjust tubing to hang in straight line from top of mattress to drainage chamber. If chest tube is draining fluid, indicate time (e.g., 0900) that drainage was begun on drainage bottle's adhesive tape or on write-on surface of disposable commercial system**

- (1) Strip or milk chest tube only per MD/PA orders only
- (2) Follow local policy for this procedure

**Problems solving with chest tubes**

**Problem: Air leak**

- (1) Problem: Continuous bubbling is seen in water-seal bottle/chamber, indicating that leak is between patient and water seal
  - (a) Locate leak
  - (b) Tighten loose connection between patient and water seal
  - (c) Loose connections cause air to enter system.
  - (d) Leaks are corrected when constant bubbling stops
- (2) Problem: Bubbling continues, indicating that air leak has not been corrected
  - (a) Cross-clamp chest tube close to patient's chest, if bubbling stops, air leak is inside the patient's thorax or at chest tube insertion site
  - (b) Unclamp tube and notify physician immediately!
  - (c) Reinforce chest dressing

**Warning:** Leaving chest tube clamped caused a tension pneumothorax and mediastinal shift

- (3) Problem: Bubbling continues, indicating that leak is not in the patient's chest or at the insertion site
  - (a) Gradually move clamps down drainage tubing away from patient and toward suction-control chamber, moving one clamp at a time
  - (b) When bubbling stops, leak is in section of tubing or connection distal to the clamp
  - (c) Replace tubing or secure connection and release clamp
- (4) Problem: Bubbling continues, indicating that leak is not in tubing
  - (a) Leak is in drainage system
  - (b) Change drainage system

**Problem: Tension pneumothorax is present**

- (1) Problems: Severe respiratory distress or chest pain
  - (a) Determine that chest tubes are not clamped, kinked, or occluded. Locate leak
  - (b) Obstructed chest tubes trap air in intrapleural space when air leak originates within patient
- (2) Problem: Absence of breath sounds on affected side
  - (a) Notify physician immediately

- (3) Problems: Hyperresonance on affected side, mediastinal shift to unaffected side, tracheal shift to unaffected side, hypertension or tachycardia
  - (a) Immediately prepare for another chest tube insertion
  - (b) Obtain a flutter (Heimlich) valve or large-gauge needle for short-term emergency release of air in intrapleural space
  - (c) Have emergency equipment (oxygen and code cart) near patient
- (4) Problem: Dependent loops of drainage tubing have trapped fluid
  - (a) Drain tubing contents into drainage bottle
  - (b) Coil excess tubing on mattress and secure in place
- (5) Problem: Water seal is disconnected
  - (a) Connect water seal
  - (b) Tape connection
- (6) Problem: Water-seal bottle is broken
  - (a) Insert distal end of water-seal tube into sterile solution so that tip is 2 cm below surface
  - (b) Set up new water-seal bottle
  - (c) If no sterile solution is available, double clamp chest tube while preparing new bottle
- (7) Problem: Water-seal tube is no longer submerged in sterile fluid
  - (a) Add sterile solution to water-seal bottle until distal tip is 2 cm under surface
  - (b) Or set water-seal bottle upright so that tip is submerged

***Appendix A  
Wound Care  
Competency Skill Sheets***

**Irrigation**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

	1st	2nd	3rd
a. Identifies patient and explains procedure to patient.	P / F	P / F	P / F
b. Performs patient care handwash.	P / F	P / F	P / F
c. Assembles equipment needed.	P / F	P / F	P / F
d. Positions and drapes patient as necessary.	P / F	P / F	P / F
e. Positions waterproof pad under wound.	P / F	P / F	P / F
f. Establishes a sterile field.	P / F	P / F	P / F
g. Dons gown and goggles as appropriate.	P / F	P / F	P / F
h. Dons clean gloves, removes dressing and discards.	P / F	P / F	P / F
i. Assesses wound prior to irrigation, noting size, color, warmth, and amount of discharge or blood from wound.	P / F	P / F	P / F
j. Removes gloves and performs a patient care handwash.	P / F	P / F	P / F
k. Dons sterile gloves.	P / F	P / F	P / F
l. Cleans area around wound.	P / F	P / F	P / F
m. Fills irrigating syringe with solution; attach a soft catheter if needed for a deep wound with a small opening.	P / F	P / F	P / F
n. Instills solution gently into wound, holding syringe 1" above wound. If using a catheter, gently insert into the wound opening until slight resistance is met, pull back and gently instills solution.	P / F	P / F	P / F
o. Allows solution to flow from clean area of wound to dirty area.	P / F	P / F	P / F
p. Refills solution and continue irrigation until solution return is clear.	P / F	P / F	P / F
q. Blots wound edges with sterile gauze.	P / F	P / F	P / F
r. Redresses wound.	P / F	P / F	P / F
s. Removes gloves and all equipment, discarding in appropriate biohazard receptacles as required.	P / F	P / F	P / F
t. Performs patient care handwash.	P / F	P / F	P / F
u. Documents procedure.	P / F	P / F	P / F
v. Verbalizes that he/she would report an increase in pain, fresh bleeding, retention of irrigant solution or sings of shock to MD/PA.	P / F	P / F	P / F

Instructor Comments:

**Sterile Field**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

	1st	2nd	3rd
a. Selects clean work surface above waist level.	P / F	P / F	P / F
b. Assembles necessary equipment.	P / F	P / F	P / F
c. Checks dates, labels and condition of packaging for sterility of equipment.	P / F	P / F	P / F
d. Performs patient care handwash.	P / F	P / F	P / F
e. Places pack directly on work surface and opens as described to ensure sterility of the sterile drape.	P / F	P / F	P / F
f. Gently lifts drape up from its outer cover and lets it unfold by itself without touching any object; discards outer cover with the other hand.	P / F	P / F	P / F
g. Grasps adjacent corner of drape and holds it straight up and away from body; now drape is properly placed while using two hands. Drape must be held away unsterile surface.	P / F	P / F	P / F
h. Holding drape, first positions the bottom half over the intended work surface.	P / F	P / F	P / F
i. Allows top half of drape to be placed over work surface last.	P / F	P / F	P / F
j. Performs procedure using sterile technique.	P / F	P / F	P / F

Instructor Comments:



***Appendix B  
Cardiac Monitoring  
Competency Skill Sheets***

**Pulse Ox**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

		1st	2nd	3rd
a.	Selected site. If finger is selected, removed fingernail polish or acrylic nail.	P / F	P / F	P / F
b.	Determined capillary refill at site. If less than 3 seconds, selected alternative site.	P / F	P / F	P / F
c.	Position patient comfortably. (1) Supported lower arm if finger is chosen as monitoring site. (2) Instructed client to keep sensor probe site still.	P / F	P / F	P / F
d.	Attached sensor probe to selected site. Ensured photo detectors of light sensors are aligned opposite each other.	P / F	P / F	P / F
e.	Turned on oximeter by activating power. (1) Observed pulse waveform/intensity display and audible beep. (2) Compared oximeter pulse rate with patient's radial pulse.	P / F	P / F	P / F
f.	Left sensor probe in place until oximeter reaches constant value and pulse display reaches full strength.	P / F	P / F	P / F
g.	Read SpO2 on digital display.	P / F	P / F	P / F
h.	Checked SpO2 alarm limits, if continues SpO2 monitoring is planned . (1) Determined limits for SpO2 and pulse rate as indicated by patient's condition. (2) Verified alarms are on. (3) Relocated sensor probe every 4 hours (if indicated).	P / F	P / F	P / F
i.	Removed probe and turned off oximeter power.	P / F	P / F	P / F

Instructor Comments:

**12 Lead EKG**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

		1st	2nd	3rd
a.	Checked equipment. (1) Ensured machine is turned on and allowed ample time to warm up. (2) Inspected machine for any malfunctions. (3) Checked machine's paper supply. (4) Ensured all equipment is on hand.	P / F	P / F	P / F
b.	Gathered patient information.	P / F	P / F	P / F
c.	Explained procedure to the patient.	P / F	P / F	P / F
d.	Selected electrode site (arms, legs, and chest positions).	P / F	P / F	P / F
e.	Considered special cases of placement.	P / F	P / F	P / F
f.	Wiped selected area with alcohol before applying electrode.	P / F	P / F	P / F
g.	Applied electrodes. (1) Ensured electrodes are not falling off patient. (2) Ensured patient cable is not twisted and not interfering with other leads.	P / F	P / F	P / F
h.	Pressed record EKG button. (1) Reminded patient to relax. (2) Checked leads for contact.	P / F	P / F	P / F
i.	Recognized a good EKG.	P / F	P / F	P / F
j.	Disconnected EKG. (1) Disconnected patient. (2) Cleaned electrode surfaces as removed from patient.	P / F	P / F	P / F

Instructor Comments:

**Appendix C**  
**Respiratory Care**  
**Competency Skill Sheets**

**Nebulization**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_  
Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_  
Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_  
Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

	1st	2nd	3rd
a. Verified MD/PA order for treatment.	P / F	P / F	P / F
b. Verified patient's allergies to medication.	P / F	P / F	P / F
c. Prepared medication.	P / F	P / F	P / F
d. Assembled nebulizer as directed.	P / F	P / F	P / F
e. Placed medication and NS into receptacle. Screwed lid onto medication receptacle.	P / F	P / F	P / F
f. Attached mouthpiece to receptacle. Attached reservoir tubing to other end.	P / F	P / F	P / F
g. Connected nebulizer to compressed air or oxygen source.	P / F	P / F	P / F
h. Turned on compressed air/oxygen until a fine mist is observed from mouthpiece of nebulizer (usually requires 10-12 LPM of compressed air/oxygen).	P / F	P / F	P / F
i. Had patient place mouthpiece in mouth and close lips around mouthpiece.	P / F	P / F	P / F
j. Instructed patient to inhale medication as deeply as possible and exhale through nebulizer. (1) Made sure patient did not hyperventilate or hold breath.	P / F	P / F	P / F
k. Allowed treatment 5-10 minutes.	P / F	P / F	P / F
l. Upon completion of treatment, turned off compressed air/oxygen.	P / F	P / F	P / F
m. Assessed respiratory status by auscultating the lungs.	P / F	P / F	P / F
n. Monitored vital signs, including pulse oximetry (if available).	P / F	P / F	P / F
o. Documented treatment.	P / F	P / F	P / F

Instructor Comments:

**Inhaler**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

	1st	2nd	3rd
a. Verified MD/PA orders.	P / F	P / F	P / F
b. Assessed patient's ability to hold, manipulate, and depress inhaler.	P / F	P / F	P / F
c. Assessed patient's knowledge and understanding of purpose and action of prescribed inhaler.	P / F	P / F	P / F
d. Assessed drug schedule and number of inhalations prescribed for each dose.	P / F	P / F	P / F
e. Positioned patient comfortably.	P / F	P / F	P / F
f. Gathered equipment and washed hands.			
g. Allowed client opportunity to manipulate inhaler. Explained and demonstrated how canister fits into inhaler.	P / F	P / F	P / F
h. Explained what metered dose is and warned patient about overuse of inhaler.	P / F	P / F	P / F
i. Explained steps for administering inhaled dose of medication. (1) Removed mouthpiece cover from inhaler. (2) Shook inhaler well. (3) Had client take a deep breathe and exhale. (4) Instructed patient to position inhaler.	P / F	P / F	P / F
j. With inhaler in proper position, had client hold inhaler with thumb at mouthpiece and index finger and middle finger at the top.	P / F	P / F	P / F
k. Instructed client to tilt head back slightly, inhale slowly and deeply through mouth, and depressed medication canister fully.	P / F	P / F	P / F
l. Had patient hold breath for approximately 10 seconds.	P / F	P / F	P / F
m. Had patient exhale through pursed lips.	P / F	P / F	P / F
n. Assessed patient's respirations.	P / F	P / F	P / F
o. Documented procedure.	P / F	P / F	P / F

Instructor Comments:

**Wall Mount O2**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_

Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

	1st	2nd	3rd
a. Verified MD/PA orders.	P / F	P / F	P / F
b. Gathered equipment.	P / F	P / F	P / F
c. Explained procedure to the patient.	P / F	P / F	P / F
d. Positioned patient.	P / F	P / F	P / F
e. Assess patient's airway. (1) Considered laboratory reports of arterial blood gas levels. (2) Suctioned any secretions obstructing the airway (3) Reassessed lung sounds.	P / F	P / F	P / F
f. Filled humidifier container to designated level.			
g. Attached flowmeter to humidifier and inserted in proper source.	P / F	P / F	P / F
h. Administered oxygen via nasal cannula. (1) Attached nasal cannula to oxygen tubing. (2) Attached to flowmeter. (3) Placed prongs in cup of water. Adjusted flow meter to 6 to 10 L to flush tubing and prongs with oxygen. Once water, bubbles, removed and wiped off water. (4) Adjusted flow rate to prescribed amount. (5) Placed nasal prong into each naris of patient. Adjusted liter flow per order. (6) Adjusted straps of cannula over the ears and tighten under the chin. (7) Placed padding between strap and ear.	P / F	P / F	P / F
i. Administered oxygen via face mask. (1) Adjusted flow rate of oxygen per order. (2) Allowed patient to hold mask and placed hand over patient's hand. (3) Placed mask over bridge of nose, then covered mouth. (4) Adjusted straps around patient's head and over ears. (5) Placed cotton ball or gauze over ears under elastic straps. (6) Observed reservoir bag. Ensure expanding and collapsing with patient's breath.	P / F	P / F	P / F
j. Maintained regular assessment. (1) Maintained solution in humidifier. (2) Cleaned and dried nares/face as indicated.	P / F	P / F	P / F
k. Documented procedure.	P / F	P / F	P / F

Instructor Comments:

**Wall Mount Suction**

Soldiers Name: \_\_\_\_\_ SSN: \_\_\_\_\_ CO: \_\_\_\_\_ TM: \_\_\_\_\_  
Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Initial Evaluator: \_\_\_\_\_  
Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Retest Evaluator: \_\_\_\_\_  
Start: \_\_\_\_\_ Stop: \_\_\_\_\_ Final Evaluator: \_\_\_\_\_

	1st	2nd	3rd
a. Verified MD/PA orders.	P / F	P / F	P / F
b. Explained procedure to the patient.	P / F	P / F	P / F
c. Gathered necessary equipment	P / F	P / F	P / F
d. Donned gloves and used mask or face shield.	P / F	P / F	P / F
e. Opened suction kit/catheter using aseptic technique.			
f. Filled basin with approximately 100cc of Normal Saline.	P / F	P / F	P / F
g. Connected one end of connecting tubing to suction machine. (1) Checked to ensure equipment if functioning by suctioning a small amount of water from basin.	P / F	P / F	P / F
h. Turned on suction device. Set regulator to 80-120mm HG.	P / F	P / F	P / F

**Oropharyngeal suctioning**

a. Attached suction catheter to connecting tubing.	P / F	P / F	P / F
b. Removed oxygen mask. If nasal cannula is used, left in place.	P / F	P / F	P / F
c. Positioned patient.	P / F	P / F	P / F
d. Inserted catheter into patient's mouth.	P / F	P / F	P / F
e. With suction applied, moved catheter around mouth.	P / F	P / F	P / F
f. Encouraged patient to cough.	P / F	P / F	P / F
g. Repeated suctioning as needed.	P / F	P / F	P / F
h. Replaced oxygen mask if removed.	P / F	P / F	P / F
i. Suctioned water from basin through catheter until the catheter is cleared of secretions.	P / F	P / F	P / F
j. Placed catheter in clean, dry area.	P / F	P / F	P / F
k. Turn off suction device.	P / F	P / F	P / F
l. Disposed of water and cleaned basin.	P / F	P / F	P / F
m. Removed gloves and washed hands.	P / F	P / F	P / F
n. Documented procedure.	P / F	P / F	P / F



**Nasotracheal suctioning**

a.	Attached nonsterile suction tubing to sterile catheter.	P / F	P / F	P / F
b.	Secured catheter to tubing aseptically.	P / F	P / F	P / F
c.	Coated distal 2-3 inches of catheter with water-soluble lubricant.	P / F	P / F	P / F
d.	Removed oxygen delivery device.	P / F	P / F	P / F
e.	Without applying suction, used dominant thumb and forefinger to gently insert sterile catheter into either naris. Inserted during inhalation with slight downward slant.	P / F	P / F	P / F
f.	Inserted catheter approximately 16-20 cm or distance from patient's nose to base of the earlobe.	P / F	P / F	P / F
g.	Applied intermittent suction by placing and releasing nondominant thumb over vent of catheter.	P / F	P / F	P / F
h.	Assess the need to repeat suctioning procedure. (1) Allowed adequate time between suction passes for ventilation and oxygenation. (2) Asked patient to breathe deeply. Encourage coughing. (3) Kept oxygen readily available. (4) Administered oxygen to patient between suctioning attempts.	P / F	P / F	P / F
i.	Performed oral suctioning to clear mouth of secretions.	P / F	P / F	P / F
j.	Rinsed catheter and connection tubing.	P / F	P / F	P / F
k.	Disposed of equipment.	P / F	P / F	P / F
l.	Turned off suctioning device.	P / F	P / F	P / F
m.	Removed gloves and washed hands.	P / F	P / F	P / F
n.	Documented procedure.	P / F	P / F	P / F

Instructor Comments: