

91W10  
Advanced Individual  
Training Course



Clinical Handbook  
Supportive Care

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### **TERMINAL LEARNING OBJECTIVE**

Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available) and glucometer. You encounter a casualty who has a metabolic and endocrine systems problem.

#### ***Principles of glucose metabolism***

All body cells use glucose as an energy source

The brain requires a constant supply of glucose

The blood stream delivers glucose to the cells for use as energy

Insulin must be present for glucose to enter the cells

Glucose and insulin balance are necessary for effective metabolism and use of glucose as an energy source

#### **Without insulin**

- (1) Glucose cannot enter the cell from the bloodstream
- (2) Acids are formed when fat is used for energy needs and can lead to diabetic ketoacidosis

#### **The three Ps of weight loss occur when glucose is not adequately metabolized. Frequently seen in undiagnosed diabetics.**

- (1) Polyuria – The excess amount of glucose in the blood forces water into the bloodstream. The extra water is secreted as excess urine.
- (2) Polydipsia – increased thirst that results in increased water drinking. Secondary to increased volume of urine.
- (3) Polyphagia – The cells and tissues cannot utilize the sugar in the blood; therefore, the cells begin to starve. This starvation causes hunger and excessive eating.
- (4) Weight loss – The cells cannot use the sugar, so they break down fat and protein for energy causing weight loss

#### ***Assess the casualty for hypoglycemia and hyperglycemia***

#### **Hypoglycemia is a true medical emergency!**

#### **Hypoglycemia**

- (1) Generally defined as a serum glucose level of less than 50 mg/dl
- (2) Signs and symptoms (tachycardia, cool, moist or clammy skin, dizziness, complaints of hunger) are consistent with the diagnosis
- (3) Signs and symptoms are resolved following glucose administration.

#### **Causes of hypoglycemia**

- (1) In an insulin-dependent diabetic is often the result of too much insulin, too little food, or both
- (2) A diabetic who has not eaten does not have enough dietary intake of glucose to use for a circulating level of insulin
- (3) Excessive exercise or exertion uses up the glucose energy stores
- (4) Vomiting or diarrhea depletes the body of fluids, electrolytes, and potential sources of glucose

**Signs and symptoms of hypoglycemia**

- (1) Rapid onset - over a period of minutes
- (2) Intense hunger
- (3) Cold, pale, moist, or clammy skin
- (4) Full, rapid pulse
- (5) May appear intoxicated
- (6) Dizziness and headache
- (7) Copious saliva (drooling)
- (8) Normal blood pressure
- (9) Altered mental status and seizures are symptoms of severe hypoglycemia (blood glucose < 30 mg/dl)

**Treatment and transport considerations for hypoglycemia**

- (1) Conscious patient
  - (a) Perform the initial assessment. Check for a medical alert identification
  - (b) Perform a focused history and physical exam and SAMPLE history
  - (c) Perform a D (dextrose) stick or Accucheck as per local protocol
  - (d) Administer oral glucose IAW local protocol if all three of the following are present:
    - (i) The patient has a history of diabetes
    - (ii) The patient's mental status is altered
    - (iii) The patient is awake enough to swallow
    - (iv) Dose - one glucose tube
  - (e) Adult - Place glucose on the tongue depressor between the cheek and the gum or self administer it between the cheek and the gum
  - (f) If oral glucose is not available, give granular sugar, honey, hard candy, or orange juice
  - (g) If a patient becomes unconscious, remove the tongue depressor and assure and open the airway
  - (h) Monitor and maintain airway
- (2) Unconscious patient and/or inability to swallow

**WARNING:** DO NOT GIVE UNCONSCIOUS PATIENTS ANYTHING BY MOUTH!

- (a) Initiate and maintain IV of normal saline (promotes excretion of keynote bodies)
- (b) Administer pharmacological interventions
  - (i) 50% Dextrose
  - (ii) Therapeutic effects: Rapidly restores blood sugar levels to normal in states of hypoglycemia
  - (iii) Indications: To treat suspected hypoglycemia or a coma of unknown cause
  - (iv) Contraindications: Intracranial hemorrhage, known stroke (CVA)

- (v) Side effects: Will cause tissue necrosis if it infiltrates
- (vi) How supplied: Prefilled syringes containing 50 cc of 50% dextrose (25 Grams)
- (vii) Administration and dosage: Give through patent IV line. If possible obtain serum glucose prior to administration dosage is 50ml of 50% solution
- (c) Treat patient like any other with an altered mental status
- (d) Continue to monitor and maintain airway
- (e) Administer oxygen, if available
- (f) Start artificial ventilations if necessary
- (g) Transport - Continue ongoing assessment en route.
- (3) Position patient - If the patient does not require artificial ventilations, place him in a lateral recumbent position in case s/he vomits

**When cause is known, treat as though hypoglycemia; give sugar**

- (1) A patient in diabetic ketoacidosis will not be harmed by having sugar
- (2) A patient in severe hypoglycemia will respond rapidly

**CAUTION:** When a patient appears intoxicated, treat the patient as a diabetic emergency. Always check for underlying conditions. Never assume the patient is "only drunk."

**Hyperglycemia**

- (1) Generally defined as a random blood glucose > 200 mg/dl or a fasting blood glucose > 140 mg/dl

**Causes of hyperglycemia**

- (1) Undiagnosed/untreated diabetic condition
- (2) Insulin not taken
- (3) Overeating
- (4) Infection that disrupts glucose/insulin balance
- (5) Myocardial infarction (heart attack)

**Signs and symptoms (Blood glucose 200-400 mg/dl)**

- (1) Patients are often asymptomatic. Increased blood glucose is found on incidental laboratory examination or a random self glucose test.
- (2) Slow onset - occurs over a period of days or weeks
- (3) Dry mouth
- (4) Intense thirst
- (5) Frequent urination
- (6) Blurred vision
- (7) Frequent infections

**Signs and symptoms (Blood glucose > 400 mg/dl)**

- (1) Usually more dramatic presentation
- (2) Intense thirst
- (3) Abdominal pain
- (4) Vomiting
- (5) Progressive restlessness/confusion
- (6) Respiration may be very deep and rapid (Kussmaul respirations)

- (7) Weak, rapid pulse
- (8) Warm, red, dry skin
- (9) Sunken eyes
- (10) Acetone breath (fruity odor)
- (11) May appear intoxicated
- (12) Normal to slightly low blood pressure

**Treatment and transport considerations**

- (1) Maintain an open airway
- (2) Administer a high concentration of O<sub>2</sub>, if available
- (3) Perform D (dextrose) stick or Accucheck per local protocol
- (4) Initiate and maintain an IV of Normal Saline
- (5) Transport immediately
- (6) Continuously monitor vital signs

**WARNING:** If untreated, hyperglycemia will eventually lead to diabetic ketoacidosis. The metabolism of substances other than sugar creates high levels of acid in the blood. THIS PROCESS CAN LEAD TO DEATH.

***Disorders of the Thyroid Gland***

**Common acute thyroid disorders include**

- (1) Hyperthyroidism – presence of excess thyroid hormones in the blood
- (2) Thyrotoxicosis – a condition that reflects prolonged exposure of body organs to excess thyroid hormones, with resultant changes in structure and function. Thyrotoxicosis is generally caused by Grave's Disease
- (3) Thyrotoxic Crisis – "Thyrotoxic Storm" life threatening emergency characterized by hyperthermia, nervous symptoms, and rapid metabolism
- (4) Hyperthyroidism – presence of inadequate thyroid hormones in the blood
- (5) Myxedema – condition that reflects long-term inadequate levels of thyroid hormones with resultant change in function and structure
- (6) Myxedema Coma – uncommon complication of myxedema that can be fatal if respiratory depression occurs. Usually triggered by acute infection, trauma, cold infection, exposure to CNS depressants such as alcohol and drugs.

**Thyrotoxicosis**

- (1) Less serious than Thyroid Storm
- (2) Important causes of palpitations
- (3) Commonly caused by undiagnosed or untreated Graves' disease, infectious process or surgery

**Thyroid storm (more serious form of Thyrotoxicosis)**

- (1) Medical emergency
  - (a) Elevated temperature ( $T > 38.7^{\circ}\text{C}$ , but may be as high as  $41^{\circ}\text{C}$ )
  - (b) CNS dysfunction (anxiety, emotional lability, delirium)
  - (c) Cardiovascular dysfunction
  - (d) Gastrointestinal dysfunction (nausea, vomiting, hyperdefecation or diarrhea, crampy abdominal pain)
  - (e) May mimic or complicate sepsis, sympathomimetic intoxication, or a drug withdrawal

**Signs and symptoms**

- (1) Sinus tachycardia (heart rate  $> 100$  bpm) is almost always present
- (2) Heart rate may be fast and irregular
- (3) Enlarged thyroid may be palpable
- (4) Proptosis and other eye findings indicative of Graves' disease
- (5) Brisk reflexes
- (6) Anxiety
- (7) Tremor
- (8) Weakness
- (9) Heat intolerance
- (10) Weight loss
- (11) Hyperdefecation
- (12) Sweating
- (13) Angina and congestive heart failure (CHF) may be present

**Treatment considerations**

**NOTE:** In most cases mild thyrotoxicosis is referred for outpatient evaluation and treatment. If patient is symptomatic but not acutely ill, beta-adrenergic blockade with propranolol (slow 1 mg IV bolus may be administered in accordance with physicians' orders).

- (1) Emergency care for Thyroid storm
  - (a) Provide supportive care including cooling measures (ice packs, cooling blankets)
  - (b) Contact MD/PA immediately for specific guidance
  - (c) Initiate and maintain IV access and fluids
  - (d) Administer oxygen
- (2) Provide on-going management for Thyroid storm
  - (a) Monitor patient's response to treatment
  - (b) Monitor airway if unconscious
  - (c) Place patient in quiet, reassuring environment, if possible
  - (d) Maintain IV fluids as directed
  - (e) Evacuate for further treatment as required
- (3) It is imperative to consider other processes as precipitants of thyroid storm or as a primary cause of symptoms
  - (a) Infection
  - (b) Surgery
  - (c) Trauma
  - (d) Emotional stress

### **Hypothyroidism**

#### **Hypothyroidism-**

A condition of decreased activity of the thyroid gland

- (1) Body's normal rate of functioning slows causing mental and physical sluggishness
- (2) Most severe form is called myxedema, which is a medical emergency

#### **Risk factors**

- (1) Over 50 years old
- (2) Female
- (3) Obesity
- (4) Thyroid surgery
- (h) X-ray or radiation treatments to the neck

#### **Signs and symptoms**

- (1) Physical Examination and X-Ray
  - (a) Enlarged thyroid on physical exam
  - (b) Delayed reflexes
  - (c) Slow heart rate
  - (d) Low blood pressure
  - (e) Low temperature
  - (f) Chest x-ray indicates an enlarged heart
- (2) Early symptoms:
  - (a) Weakness
  - (b) Fatigue
  - (c) Cold Intolerance
  - (d) Constipation
  - (e) Weight gain
  - (f) Depression
  - (g) Joint or muscle
  - (h) Thin, brittle fingernails
  - (i) Coarse thick hair
  - (j) Pale color
- (3) Late symptoms:
  - (a) Slow speech
  - (b) Dry flaky skin
  - (c) Thickening of the skin
  - (d) Puffy face, hands and feet
  - (e) Decreased taste and smell
  - (f) Thinning of eyebrows
  - (g) Hoarseness
  - (h) Menstrual disorders

### **Myxedema –**

#### **Untreated severe hypothyroidism**

- (1) Thickness of connective tissue in the skin and other tissues including the heart
- (2) Most commonly seen in middle aged or elderly



- (3) Myxedema Coma is a medical emergency and is manifested by profound hypothermia, bradycardia, and respiratory depression
- (4) Treatment is supportive – maintain and monitor airway
- (5) Transport/evacuate to definitive care facility immediately
- (6) May be fatal if left untreated

## TERMINAL LEARNING OBJECTIVE

Given a CMVS or M5 aid bag standard packing list, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, documentation forms. You encounter a suspected casualty complaining of neurological symptoms. No other injury (ies) is/are present.

### *Determine the cause and/or mechanism of injury*

#### **Levels of Consciousness –**

Abnormal levels of consciousness may be associated with decreased or increased neurological activity, such as stupor, coma, delirium, or violent behavior. There may be partial to complete mental clouding or loss of consciousness.

- (1) Frequent causes of altered levels of consciousness are cerebrovascular accident (CVA), drugs, poisons, metabolic illness, fever, head injury, subarachnoid hematoma (SAH), Subdural hematoma (SDH), and epidural hematoma
- (2) The two major categories of altered levels of consciousness are stupor and coma
  - (a) Stupor ranges from partial to almost complete loss of consciousness
  - (b) Coma is complete unconsciousness from which the patient cannot be roused
- (3) Emergency Management of Life-Threatening Neurological Problems
  - (a) Confirm an unconscious state
    - (i) Attempt to arouse the patient by pinching or shouting to rule out sleep or a simple faint
  - (b) Secure the airway
  - (c) Give supplemental oxygen, if needed
  - (d) Establish adequacy of ventilation
    - (i) If respirations are slow or diminished, begin assisted ventilation
  - (e) Establish circulation - Begin CPR, if needed. Obtain vital signs, and treat shock, if present.
  - (f) Obtain description of the onset of illness or injury and a history of chronic illnesses e.g. diabetes, hypertension, drug abuse, chronic headaches
  - (g) Perform a rapid physical examination, utilizing the Glasgow Coma Scale
- (4) The Glasgow Coma Scale
  - (a) Widely used method of evaluating the level of consciousness
  - (b) Glasgow Coma Scale assigns a numerical score to the patient's responses in three categories
    - (i) Eye opening
    - (ii) Best motor response
    - (iii) Best verbal response
  - (c) Repeat assessment frequently to assess for changes
  - (d) Assess the patient's score in each category, and total the scores of the three categories.

- (5) Treatment - the immediate objective of emergency treatment and stabilization is to maintain life until a specific diagnosis can be made.  
**DONT Protocol:**  
(a) **D**extrose  
(b) **O**xygen  
(c) **N**arcan  
(d) **T**hiamin

**Assess a casualty in a field setting using the Glasgow Coma Scale**

**Seek an appropriate location to conduct the neurological status exam**

- (1) In a hostile zone  
(a) Move the casualty to an area that provides adequate cover and concealment  
(b) As with all injuries a primary survey must be conducted focusing on the ABC's and stabilizing life-threatening injuries before any type of assessment is started  
(c) Time and Circumstances may not permit a full neurological assessment and in fact may dictate that the soldier medic move on to the next casualty after treating for life threatening injuries  
(d) Assess the casualty using the Glasgow Coma Scale

**Assess a patient with neurological symptoms in a clinical setting**

**A clinical environment lends itself to the conduct of a full neurological assessment.**

- Seek an appropriate setting to conduct the neurological status exam.  
(1) Use a well-lit room  
(2) Free of distractions  
(3) If available, question family and friends

**Assess mental status and speech**

- (1) Determine level of consciousness  
(a) Normal  
(b) Drowsiness  
(c) Stupor  
(d) Coma  
(2) Observe posture and motor behavior  
(a) Gait  
(b) Gestures  
(c) Mannerisms  
(d) Speed of movement - fast, normal, and slow  
(e) Over or under active  
(f) Purposeful or disorganized  
(3) Observe dress, grooming, and personal hygiene  
(a) Appropriately dressed for age, social status  
(b) Cleanliness  
(c) Hair, teeth, and nail care  
(4) Observe facial expressions  
(a) Appropriate to topics being discussed  
(b) Describe  
(i) Alert  
(ii) Tense

- (iii) Worried
  - (iv) Sad
  - (v) Happy
  - (vi) Angry
  - (vii) Laughing
- (5) Observe and record the patient's manner, affect, and relationship to persons and things
- (a) Describe (afraid, seeking help, evasive, etc.)
  - (b) Affect- is the patient's voice, facial expression, and movement appropriate to topic being discussed?

**Observe speech and language for**

- (1) Quantity
- (2) Rate
- (3) Volume - rapid and loud, mania, soft and low

**Observe Mood - as reported by patient**

- (1) Intensity
- (2) Duration
- (3) Appropriate to circumstances

**Observe thought and perceptions – are the patient's perceptions appropriate to the situation?**

**Memory and orientation**

- (1) Orientation
  - (a) person - does pt know who he/she is
  - (b) place - location, where he/she lives
  - (c) time - day of week, date, time of day
- (2) Attention- does the patient answer appropriately?
- (3) Remote memory - place of birth, where he/she is from
- (4) Recent memory - questions related to the presenting problem. (the days weather, appointment time, etc.)

**Suicidal and homicidal patients**

- (1) MUST be evaluated by a Medical Officer (MO)
- (2) Most are not mentally ill, but overwhelmed by life stressors

**Summary/Assessment of Mental Status**

- (1) Summary of findings/conclusions
- (2) The mental exam is the psychiatric counterpart of the physical exam

**General approach to the neurologic exam**

- (1) Organize exam into 5 basic areas
  - (a) mental status/speech -as previously discussed
  - (b) cranial nerves
  - (c) cerebellar
  - (d) motor
  - (e) sensory
  - (f) reflexes

**Techniques of examination**

- (1) Mental status and speech- as described above
- (2) Cranial nerves
  - (a) Mnemonics for remembering nerves (1st letter stands for first letter of nerve)
    - (i) On Old Olympus Towering Tops, A Finn And German Viewed Some Hops (Tests the olfactory, optic, oculomotor, trochlear, trigeminal, abducens, facial, acoustic, glossopharyngeal, vagus, spinal accessory, & hypoglossal)
  - (b) Cranial Nerve I (CN-I): Olfactory
    - (i) Sense of smell
    - (ii) Test by holding familiar items under the patient's nose with their eyes closed. Clamp each nostril testing each one separately.
  - (c) Cranial nerve II (CN-II): Optic
    - (i) Vision sense
    - (ii) Tests visual acuity, visual fields, peripheral vision, and fundoscopic exam
  - (d) Cranial nerves III, IV, & VI: Oculomotor = CN-III, Trochlear = CN-IV, Abducens = CN-VI
    - (i) Function
      - \* CN-III - extraocular muscle movement, pupillary light accommodation and consensual reflexes, and elevation of eyelid
      - \* CN-IV – extraocular muscle movement
      - \* CN-VI – extraocular muscle movement
    - (ii) Test for extraocular muscle movement by:
      - \* Holding a small object in front of patient
      - \* Have patient follow object as it is moved through the 6 cardinal positions of gaze
    - (iii) Test for size and shape of pupils and pupillary reaction to light
  - (e) Fifth cranial nerve (CN-V): Trigeminal nerve
    - (i) Function
      - \* Motor - temporal, and masseter muscles along with lateral movement of the jaw
      - \* Sensory - three separate distributions, V-1 = to the forehead, V-2= to the cheeks, V-3 = to the chin
    - (ii) Test function
      - \* Test motor function by having patient clench teeth and move jaw side to

- side. Palpate strength of muscle contraction. Feel contraction of temporal muscles.
- \* Test sharp/dull sensation with a safety pin and light touch to forehead, cheeks, and chin on both sides
- (f) 7th cranial nerve (CN-VII): Facial nerve
- (i) Function
    - \* Motor - muscle of facial expression
  - (ii) Test function
    - \* Inspect face for symmetry or abnormal movements
    - \* Have patient raise eyebrows, frown, close eyes tightly (and test strength by trying to open them with your fingers). Show upper and lower teeth, smile and puff out cheeks
- (g) 8th cranial nerve (CN-VIII): Vestibulocochlear
- (i) Function
    - \* Hearing
  - (ii) Test hearing
    - \* Snap fingers in front of each ear to assess gross hearing function
- (h) 9th & 10th cranial nerves: CN-IX Glossopharyngeal, CN-X Vagus
- (i) Function
    - \* CN-IX: sensory - posterior ear drum/canal, pharynx. Motor - pharynx.
    - \* CN-X: sensory - pharynx & larynx. Motor - soft palate, pharynx, and larynx/vocal cords.
  - (ii) Test for
    - \* Vocal quality
    - \* Observe upward movement of posterior oropharynx and symmetry
    - \* Stimulate gag reflex on each side with cotton swab
    - \* Ability to elevate palate
- (i) 11th cranial nerve (CN-XI): Spinal accessory nerve
- (i) Function
    - \* Motor - upper portion of sternocleidomastoid and trapezius muscles
  - (ii) Test for
    - \* Ability to turn head side to side
    - \* Ability to shrug shoulders upwards against resistance
- (j) 12th cranial nerve (CN-XII): Hypoglossal nerve
- (i) Function



- (iii) Scatter stimuli to cover most major peripheral nerves
- (iv) Vary the placement of your exam
- (v) Map areas of altered sensation by proceeding in a stepwise fashion outwards until patient detects change
- (b) Pain
  - (i) Use sharp/dull areas of a safety pin
  - (ii) Use light pressure
- (c) Light touch
  - (i) Touch skin lightly with wisp of cotton and ask patient to respond
  - (ii) Compare sides
- (6) Reflexes
  - (a) Graded on a 0-4 scale
    - (i) Four plus (4+) = very brisk, hyperactive
    - (ii) Three plus (3+) = brisker than normal
    - (iii) Two plus (2+) = normal
    - (iv) One plus (1+) = diminished
    - (v) Zero (0) = absent, no response

**Assessment of Patient with Specific Neurological Symptoms**

**Dizziness and Vertigo**

- (1) Dizziness is a perception of self-motion or a distortion of gravitational orientation. Dizziness is not a defined disease, but a sensory syndrome that may be produced by numerous diseases.
- (2) Vertigo is an illusionary sensation of motion or having objects move around the patient
- (3) Dizziness and vertigo should be distinguished from imbalance and syncope (loss of consciousness)
- (4) Symptoms - the patient is usually in an upright position when an acute attack occurs. They may experience:
  - (a) Motor weakness
  - (b) Epigastric distress
  - (c) Perspiration
  - (d) Restlessness
  - (d) Nausea and vomiting
  - (e) Tinnitus (ringing in the ears)
  - (h) Patients commonly have recurrent episodes
- (5) Treatment
  - (a) Management of the patient depends on the disease causing the dizziness or vertigo. All patients MUST have a full cardiac and neurological examination during initial assessment. Dizziness and vertigo are common symptoms in the elderly with cardiac disease.
  - (b) Initial stabilization utilizing a Glasgow Coma Scale should be performed if the patient is rapidly deteriorating. Serial neurological examinations should be performed while transporting patient to a MD/PA to assess.



- (c) All patients with an acute onset of dizziness or vertigo need to be evaluated by an MD/PA

**Headaches –**

Headaches are the most common pain complaint in patients. The number of different types of headache, their causes, signs, symptoms and treatments often make headache difficult to diagnose and treat. They may be caused by, tension, tumors, trauma, or any number of other causes. The following are the more common types of headaches:

- (1) Tension - These headaches are caused by spasm or contraction of muscles or adjacent structures, or they may be associated with fatigue or emotional stress. The muscles attached to the occiput and temple are the most frequently involved. These muscles will be tender to palpation
  - (a) Symptoms
    - (i) Feeling of pressure or a bandlike constriction around head. Pain is almost always bilateral
    - (ii) Not associated with vomiting. Nausea may be present
    - (iii) Patient with a tension headache will have a normal neurological examination
  - (b) Treatment - general measures consist of:
    - (i) Analgesics
    - (ii) Rest
    - (iii) Relaxation
    - (iv) Massage, and heat applied to the involved musculature
    - (v) Oral fluid hydration usually benefits headache patients- particularly in a field environment
- (2) Migraine - this type of headache is characterized by a paroxysmal attack often preceded by psychological or visual disturbance that is followed by drowsiness. Migraine headaches are believed to be the result of inflammatory vascular changes.
  - (a) Symptoms
    - (i) Specific symptoms vary with the type of migraine
    - (ii) Before the onset of a migraine headache, some patients experience a prodrome or aura. Visual auras are the most common (flashing lights or diminished vision)
    - (iii) Pain is usually unilateral- sometimes severe
    - (iv) Nausea, vomiting, photophobia (intolerance to light), phonophobia (intolerance to loud noise) may occur
    - (v) Patients may have an ill appearance
    - (vi) Other than an ill appearance, the physical examination are normal
  - (b) Often there is a family history of migraines, and the frequency of attacks may vary from daily to once every few years

- (c) Treatment Overview
  - (i) Treatment of migraine is a three-faceted approach: abortive (at the immediate onset of headache); interval (during the headache) and prophylactic (to prevent future headaches)
  - (ii) Abortive therapy is useful during the aura or at the start of a migraine. Various oral, nasal and subcutaneous medications (i.e. Cafergot, Imitrex) can be used as abortive therapy.
  - (iii) Interval therapy is directed at treating the migraine headache. Medications include analgesics (Toradol), antiemetics (Phenergan, Compazine) and abortive agents as above
  - (iv) Prophylactic therapy is aimed at prevention or reduction of the frequency and severity of headaches. Numerous categories of medications are used for this.
- (d) Treatment of an Acute Migraine
  - (i) Place the patient on bed rest in a darkened room, withhold any food or drink and initiate IV hydration. Fluids are helpful in migraine headaches
  - (ii) Utilize the medications described above for abortive or interval therapy as ordered by a MD/PA
  - (iii) Serial neurological evaluations should be performed. Reassess the patient after each medication is given
  - (iv) Evacuate the patient to be evaluated by an MD/PA for assessment and management

#### Seizures –

A seizure is defined as the behavioral manifestation of abnormal neurologic activity. Seizures are usually accompanied by altered levels of consciousness. Epilepsy is a pattern of two or more recurrent seizures. In 75% of nontraumatic seizures the cause is unknown. There are two types of seizure classifications

- (1) The two major classifications are:
  - (a) Generalized- bilateral foci that begin simultaneously
  - (b) Partial- single focus in cerebrum
- (2) Generalized Seizures
  - (a) Most commonly encountered and include the petit mal and grand mal types
  - (b) Typical generalized seizure
    - (i) Signs and symptoms
      - \* The patient may fall down and cry out, lose bladder and bowel control, and froth at the mouth
      - \* There is convulsive movement of the body, dyspnea, and cyanosis

- \* Often the patient bites the tongue and, if not completely unconscious, will be confused and disoriented. The seizure usually lasts 2 to 5 minutes.
- \* A period of deep sleep is common after the seizure, and the patient will complain of muscle soreness and stiffness upon awakening

(ii) Treatment - immediate treatment is aimed at airway, breathing, and circulation (ABC's) while preventing the patient from injuring him or herself. The second goal is identification of the seizure cause

- \* Do not use rigid restraints (may cause fractures) or insert objects into the patient's mouth during a seizure
- \* Never leave the patient alone. Protect the patient from further injury until seizure ends
- \* Loosen the clothing around the neck, and turn the head to the side to prevent aspiration of saliva and mucus
- \* Administer an anticonvulsant, such as Ativan 1-2 mg, or diazepam (Valium) 5-10 mg IV over 1-2 minutes. Give Valium only in the presence of active seizures. The objective of drug therapy is complete suppression of symptoms
- \* Refer the patient immediately to an MD/PA for evaluation. Perform serial neurological examinations during transport

#### **Cerebrovascular Accident (Stroke)**

- (1) Strokes are caused by destruction of brain matter by intracerebral hemorrhage, thrombosis, embolism, or vascular insufficiency
- (2) Stroke presentation is varied, depending on the area of brain that is involved. Symptoms include:
  - (a) Headache
  - (b) Nausea
  - (c) Vomiting
  - (d) Convulsions
  - (e) Coma
  - (f) Consciousness may not always be altered
  - (g) The patient may experience speech disturbances
  - (h) Confusion
  - (i) Loss of memory

- (j) Reduction of sensation, and paralysis of extremities or of a complete side of the body
  - (k) The onset may be sudden and violent, with the patient falling into an immediate coma and exhibiting stertorous breathing
  - (l) Death from a serious stroke may result in a few minutes to a few days
- (3) Treatment
- (a) ABC's
  - (b) Administer IV fluids (TKO)
  - (c) Place the patient on immediate and strict bed rest
  - (d) Keep head elevated 30 degrees
  - (e) Evacuate the patient for hospitalization immediately
  - (f) Cardiac monitoring, if available
  - (g) Serial neurological examinations during transport

**Subarachnoid Hemorrhage (SAH) –**

Characterized by sudden bleeding into the subarachnoid space that may be the result of trauma or a ruptured aneurysm

- (1) Symptoms - before the aneurysm ruptures
- (a) The aneurysm applies pressure to nerves that will manifest as headaches, ocular palsies, diplopia, facial pain, and a diminished visual field
  - (b) After rupture, severe headache
  - (c) Nausea
  - (d) Vomiting
  - (e) Stiffness of the neck
  - (f) Positive Kernig's sign
    - (i) A diagnostic meningeal sign marked by loss of the ability of a supine patient to completely straighten the leg when it is fully flexed at the knee and hip
    - (ii) Pain in the lower back and resistance to straightening the leg constitutes a positive Kernig's sign
  - (g) Bilateral Babinski's reflex is usually present
    - (i) Dorsiflexion of the big toe with extension and fanning of the other toes elicited by firmly stroking the lateral aspect of the sole of the foot
  - (h) The consciousness of the patient may or may not be affected, and the blood pressure is often elevated
- (2) Treatment
- (a) ABC's
  - (b) Keep the patient at rest
  - (c) IV hydration (TKO)
  - (d) Avoid any medications
  - (e) Evacuate the patient immediately
  - (f) Cardiac monitoring
  - (g) Serial neurological examinations during transport

#### **Subdural hematoma-**

Caused by the rupture of a cerebral vein. They may be caused by trauma, tumors or a medication side effect (i.e. anticoagulants). There may be a loss of consciousness at the time of the injury followed by an asymptomatic period that may last for several hours to days

- (1) Signs and symptoms the patient may have later
  - (a) Increased intracranial pressure as described above
  - (b) About one half of all persons with subdural hematoma will experience facial muscle weakness
- (2) Treatment
  - (a) Ensure that the patient has a patent airway
  - (b) Oxygen, if available
  - (c) Cardiac monitoring, if available
  - (d) Serial neurological examinations during transport
  - (f) Evacuate the patient immediately

#### **Epidural Hematoma –**

Result of blood collecting in the potential space between the skull and the dura mater. Most (80 to 90 percent) result from blunt trauma to the temporal or temporoparietal area with an associated skull fracture and middle meningeal arterial disruption.

- (1) The classic history of an epidural hematoma is for the patient to experience immediate loss of consciousness after significant blunt head trauma. The patient then awakens and has a lucid period prior to again falling unconscious as the hematoma expands.
- (2) This "classic" syndrome occurs in only about 20 percent of cases. The majority of patients either never loses consciousness or never regains consciousness after the injury.
- (3) Signs and Symptoms
  - (a) Increase intracranial pressure as previously described
  - (b) Neurological status/mental status may change rapidly due to the high pressure arterial bleeding of an epidural hematoma and can lead to herniation. The sequence of bleeding and herniation usually occurs within hours.
- (4) Treatment
  - (a) Ensure open, patent airway
  - (b) Assist with ventilations, as needed
  - (c) Administer oxygen, if available
  - (d) Cardiac monitoring, if available
  - (e) Elevate head of body 30 degrees
  - (f) Serial neurological examinations during transport
  - (g) Evacuate the patient immediately

#### **Herniated Disk –**

In most cases, herniation or rupture of an intervertebral disk is the result of trauma. It may occur with sudden straining of the back in an odd position or while lifting in the trunk flex position. Herniation may occur immediately (acute trauma) or may take years to occur (repetitive trauma). Most herniation occurs in the lumbosacral area but may also occur in the cervical or thoracic regions.

- (1) Signs and symptoms

- (a) Over 90 percent of all herniated disks occur at the fourth or fifth lumbar interspace
  - (b) There is pain upon palpation of the affected area
  - (c) The patient will have a limited range of motion
  - (d) The posture of the spine will be abnormal due to the loss of curvature of the spine
  - (e) The patient may exhibit mild weakness of the foot or extensor areas of the great toe
  - (f) There may be impaired sensations of pain or touch, and coughing or sneezing may cause radiation of the pain to the calf
- (2) Treatment
- (a) Place the patient on bed rest with a backboard and administer analgesics for pain
  - (b) Prevent the patient from using any physical effort
  - (c) Applications of heat to the area of tenderness is beneficial
  - (d) Definitive treatment of herniated disks will occasionally require surgery. Most herniated discs can be managed medically, with rest and medications.
  - (e) Evacuate the patient as soon as possible

**Refer to further medical care**

**Treatment for neurological symptoms**

May take many forms, which are beyond the scope of the soldier medic

**Several emergency medical procedures-**

Soldier medic can perform to minimize and or prevent further injury in trauma cases, and instances where the cause of injury is not obvious

- (1) Ensure that the casualty is removed from the source of injury and is stabilized, focusing on the ABC's and that life threatening injuries are treated promptly
- (3) Treat an unconscious casualty as having a potential neck or spinal injury. Immobilize and do not move the casualty unless absolutely necessary
- (2) If fractures of the spine are suspected in-line stabilization of the spine is maintained and the casualty is immobilized as necessary
- (4) If fractures of the skull are suspected that the casualty is placed in a position where the head is elevated at least 30 degrees unless other injuries prohibit that position
- (5) Avoid the use of pain medications that are CNS depressants
- (6) Evacuate the casualty a timely manner to the next level of care
- (7) Provide on going care to maintain the casualty's condition or prevent the condition from getting worse
- (8) As the situation permits document as much information as is available to send along with the casualty, so that more definitive medical care can be administered

### TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms. You encounter a casualty complaining of cardio-pulmonary symptoms. No other injury(ies) is/are present. NBC agents have been ruled out

#### **Assess Cardiac Compromise**

##### **Primary assessment**

- (1) Ensure open airway
- (2) Assess breathing
- (3) Assess circulation
  - (a) If pulse is present, continue assessment
  - (b) If no pulse, begin CPR

##### **Secondary assessment (specific to cardiopulmonary symptoms)**

- (1) Recognize signs of cardiac compromise
  - (a) Squeezing, dull pressure, chest pain commonly radiating down arms or to the jaw
  - (b) Sudden onset of sweating
  - (c) Difficulty breathing (dyspnea)
  - (d) Anxiety, irritability
  - (e) Feeling of impending doom
  - (f) Nausea/vomiting
  - (g) Unresponsive to stimuli
- (2) Assess vital signs
  - (a) Respirations
  - (b) Pulse
  - (c) Blood pressure
  - (d) Temperature
  - (e) Pulse oximetry
- (3) Focused history
  - (a) Onset of symptoms
    - (i) Sudden
    - (ii) Gradual over time
    - (iii) Known cause or "trigger"
  - (b) Duration of symptoms
    - (i) Constant
    - (ii) Recurrent
  - (c) Pain on inspiration
  - (d) Length of time
  - (e) Fever
  - (f) Smoking history
  - (g) Past medical history of associated diseases
- (4) Assess location and level of pain
  - (a) Use acronym: OPQRST
    - (i) Onset
    - (ii) Provocation
    - (iii) Quality

- (iv) Radiation
- (v) Severity
- (vi) Time
- (b) Apply pain scale
  - (i) 0 = no pain
  - (ii) 10 = worst pain

**Assess specific cardiovascular disease/disorder**

- (1) Angina pectoris
  - (a) Sudden chest pain caused by lack of oxygen supply to a portion of heart muscle
  - (b) Reduced blood flow to heart muscle usually due to coronary artery disease
  - (c) Concurrent with or following:
    - (i) Physical activity
    - (ii) Stress
    - (iii) Heavy meals
    - (iv) Exposure to cold
    - (v) Windy weather
  - (d) Signs and symptoms
    - (i) Pain, pressure, tightness, or squeezing feeling in chest area lasting 3-5 minutes
    - (ii) Radiation of pain to neck, jaw, teeth, shoulder, arms, upper back, or abdomen
    - (iii) Shortness of breath
    - (iv) Weakness
    - (v) Nausea/indigestion
    - (vi) Sweating
- (2) Acute myocardial infarction (AMI)
  - (a) Death of a portion of the myocardium caused by inadequate blood/oxygen supply through the coronary arteries
  - (b) Causes include:
    - (i) Inadequate blood supply through the coronary arteries long enough in duration that myocardium is damaged from oxygen starvation
    - (ii) Damage of myocardium causes disruption of normal electrical conduction, resulting in irregular and/or ineffective heart activity
    - (iii) Blood supply may be reduced or stopped by: coronary artery spasm, embolus, arteriosclerosis, and atherosclerosis
  - (c) Signs and symptoms
    - (i) Some or all signs and symptoms of angina pectoris
    - (ii) Pain may be intermittent (come and go)
    - (iii) Duration of pain may be 30 minutes to several hours
    - (iv) Pain may occur while at rest
    - (v) Rest and/or nitroglycerin do not relieve pain



- (vi) Signs of shock
- (vii) Dyspnea
- (viii) Anxiety, irritability, or denial
- (3) Congestive Heart Failure (CHF)
  - (a) Failure of heart to pump blood adequately to maintain tissue perfusion
  - (b) Causes include:
    - (i) Diseased heart valves
    - (ii) Hypertension
    - (iii) Obstructive pulmonary disease
    - (iv) Ineffective pumping of left ventricle. Causes blood to back up into pulmonary circulation, resulting in congestion in the lungs. Can progress to pulmonary edema (an accumulation of fluid in lung tissues and alveoli)
    - (v) Ineffective pumping of the right ventricle. Causes blood to back up into the systemic circulation, causing edema in hands, lower extremities, and sacral area, and distention of jugular veins.
  - (c) Signs and symptoms
    - (i) Agitation
    - (ii) Tachycardia
    - (iii) Dyspnea with shallow and labored respirations
    - (iv) Orthopnea - an abnormal condition in which a person must sit or stand to breathe deeply or comfortably
    - (v) Noisy respirations
    - (vi) Edema in extremities
    - (vii) Diaphoresis
    - (viii) Possible chest pain
    - (ix) Distended neck veins
    - (x) Upright posture

***Provide Care for Cardiac Compromise***

**Primary assessment**

- (1) Assess airway - ensure open airway
- (2) Assess breathing - ensure adequate ventilation
- (v) Assess circulation

**Manage patient with known cardiac history**

- (1) Place patient in position of comfort and in a quiet environment
- (2) Apply oxygen, as indicated
- (3) Apply cardiac monitor, if available
- (4) Minimize patient exertion
  - (a) Use appropriate transfer procedures
  - (b) Do NOT allow patient to walk to stretcher or down steps
- (5) Loosen restrictive clothing
- (6) IV access before administering nitroglycerin

- (7) Administer NTG as directed by MD/PA (See LP C191W063, Medication administration)
  - (a) Reassess patient history
  - (b) If nitro is not prescribed to that patient, gain permission from MD/PA or follow local SOP
  - (c) Ensure systolic blood pressure is 100 or above
  - (d) Administration
    - (i) Dose is one tablet or spray under tongue
    - (ii) Have patient keep mouth closed until dissolved and absorbed
    - (iii) Verify effectiveness - Patient should report burning sensation under tongue
- (8) Initiate cardiac monitoring (See LP C191W059, Cardiac monitoring)
  - (a) Placement of electrodes (12-lead EKG)
    - (i) Arms - anterior forearm or biceps
    - (ii) Legs - medial aspect of lower leg
    - (iii) Chest position
      - \* V1 - fourth intercostal space, right sternal
      - \* V2 - fourth intercostal space, left sternal
      - \* V3 - midway between V2 and V4
      - \* V4 - fifth intercostal space, midclavicular line
      - \* V5 - same level as V4, anterior axillary line
      - \* V6 - same level as V4 and V5 - midaxillary line
    - (iv) Ensure patient information has been entered
    - (v) Check leads for contact
    - (vi) Record as needed

**Use AED, if needed**

- (1) Reassess patient's unresponsiveness
- (2) Begin or continue CPR efforts
- (3) Deliver shock
  - (a) Turn on power
  - (b) Attach device
    - (i) One pad to right of sternum just below the clavicle
    - (ii) Other to left of precordium
  - (c) Initiate analysis of rhythm
  - (d) Deliver shock in a series of three as indicated by AED
  - (e) Check for pulse after three shocks
- (4) Reassess vital signs

**Perform ongoing management**

- (1) Monitor vitals signs every 3-5 minutes
- (2) Initiate CPR as needed
- (3) Prepare to provide artificial respiration as needed
- (4) Run EKG as indicated by MD/PA

**Assess Respiratory Symptoms**

**Primary assessment**

- (1) Assess airway - ensure open airway
- (2) Assess breathing - ensure adequate ventilation
- (3) Assess circulation
  - (a) If pulse is present, continue assessmentIf no pulse, begin CPR

**Secondary assessment (specific to pulmonary symptoms)**

- (1) Assuming ABCs are intact, begin AMPLE history
  - (a) Allergies
  - (b) Medications
  - (c) Past medical history
    - (i) Asthma
    - (ii) Heart disease
    - (iii) Emphysema
    - (iv) Smoking history
  - (d) Last oral intake
  - (e) Events leading to onset, consider asking:
    - (i) Onset of symptoms
      - \* Sudden?
      - \* Gradual over time?
      - \* Known cause or "trigger"?
    - (ii) Duration of symptoms
      - \* Constant?
      - \* Recurrent?
    - (iii) Fever? Chills?
    - (iv) Chest pain? Shortness of breath? Difficulty breathing?
    - (iii) Have you had a cough?
      - \* Productive or non-productive?
      - \* Color of sputum?
    - (iv) Other symptoms, such as nausea and vomiting?
- (2) Assess vital signs
  - (a) Respirations
  - (b) Pulse
  - (c) Blood pressure
  - (d) Temperature
  - (e) Pulse oximetry
- (3) Assess patient complaints
  - (a) When did the medical problems start?
  - (b) What are the medical problems?
  - (c) Duration of symptoms
    - (i) Constant
    - (ii) Recurrent
- (4) Inspect chest
  - (a) Use of accessory muscles and sternal or muscle retraction
  - (b) Skin color

- (c) Flaring of nares
- (d) Difficulty breathing or periods of apnea
- (e) Splinting the chest
- (f) Stridor
- (g) Productive cough
- (h) Altered mechanical effort
  - (i) Limited rise and fall of chest
  - (ii) Gaspings
  - (iii) Pursed lips
  - (iv) Chest wall paradoxical motion
- (i) Medical - physiological barriers
  - (i) Pneumonia
  - (ii) Pulmonary edema
  - (iii) Chronic Obstructive Pulmonary Disease (COPD)
- (5) Palpate the chest
  - (a) Tenderness
  - (b) Pain
  - (c) Crepitus
  - (d) Skin temperature
- (6) Auscultate the lungs
  - (a) Evaluate both inspiration and expiration
  - (b) Wheezing
  - (c) Rhonchi, rales
  - (d) Absence of breath sounds

**Provide Care for Respiratory Illness**

**Assessment findings**

- (1) Signs of severe respiratory impairment
- (2) Rapid, shallow and short breaths
- (3) Decrease lung sounds and/or wheezing

**Care for respiratory symptoms**

- (1) Place patient in position of comfort and in a quiet environment
- (2) Apply oxygen, as indicated
- (3) Minimize patient exertion
  - (a) Use appropriate transfer procedures
  - (b) Do NOT allow patient to walk to stretcher or down steps
- (4) Loosen restrictive clothing
- (5) IV access, if indicated
- (6) Cardiac monitoring, if patient has shortness of breath or chest pain

**Upper respiratory infection**

- (1) Contagious viral infections of the upper respiratory tract
- (2) Common symptoms include:
  - (a) Inflammation of the mucous membranes
    - (i) Nasal congestion
    - (ii) Runny nose
  - (b) Sneezing
  - (c) Sore throat
  - (d) Coughing

- (3) Provide care - supportive measures
  - (a) Consider pain relievers
  - (b) Drink plenty of fluid
  - (c) Rest

**Pharyngitis**

- (1) Most often caused by viral infections. May be caused by bacteria, such as group A streptococcus, which is commonly termed strep throat.
- (2) Symptoms include:
  - (a) Sore throat
  - (b) Difficulty swallowing
  - (c) Fever
  - (d) Swollen lymph nodes
  - (e) Exudate on tonsils
  - (f) Beefy red throat
- (3) Provide care
  - (a) For viral infections, treatment is to relieve symptoms only
    - (i) Consider pain relievers for pain
    - (ii) Consider gargle with warm salt water
  - (b) Bacterial pharyngitis is treated with antibiotics

**Bronchitis**

- (1) Acute bronchitis
  - (a) Generally follows a viral respiratory infection
  - (b) May be caused by any number of respiratory viruses
  - (c) Symptoms include:
    - (i) Cough, usually productive
    - (ii) Shortness of breath
    - (iii) Wheezing
    - (iv) Rales, rhonchi
    - (v) Sore throat
  - (d) Provide care
    - (i) Consider inhaled bronchodilators to open constricted air passages
    - (ii) Consider antibiotics only if sputum color changes to yellow, gray, or green
    - (iii) Consider mucolytic agents to moisten secretions
    - (iv) Provide supportive measures
      - \* Rest
      - \* Increase humidity to soothe air passages
      - \* Increase fluid intake
      - \* Refer to MD/PA for treatment

**Chronic Obstructive Pulmonary Disease (COPD)**

- (1) The term COPD identifies patients with emphysema and chronic bronchitis. Although emphysema and chronic bronchitis are diagnosed as treated as separate diseases, most patients with COPD have features of both conditions. Chronic bronchitis is characterized by an excess of bronchial secretions. Emphysema

is characterized by a destruction of air spaces with permanent airspace enlargement

- (2) Causes include:
  - (a) Smoking- the most common
  - (b) Pollution
  - (c) Infection
  - (d) Allergies
- (3) Symptoms include:
  - (a) Excessive, chronic cough
  - (b) Sputum production
  - (c) Chronic, increasing shortness of breath
  - (d) Dyspnea on exertion (DOE)
  - (e) In early stages of the disease, patient may be asymptomatic
- (4) Provide care
  - (a) COPD is largely preventable. Stress smoking cessation
  - (b) Consider respiratory treatments to facilitate the removal of thick mucous from airways
  - (c) Suggest breathing exercises
  - (d) Vaccination against influenza and pneumococcal disease
  - (e) Refer patient to MD/PA for treatment

### **Pneumonia**

- (1) Viral
  - (a) Inflammation of lungs caused by a viral infection
  - (b) Two most common viral infections that cause pneumonia
    - (i) Respiratory syncytial virus - Pediatrics
    - (ii) Influenza
  - (c) Symptoms include:
    - (i) Cough
    - (ii) Headache
    - (iii) Muscle stiffness
    - (iv) Shortness of breath
    - (v) Fever
    - (vi) Sweating
    - (vii) Fatigue
  - (d) Provide care - supportive care
    - (i) Humidified air
    - (ii) Increase fluids
    - (iii) Supplemental oxygen may be indicated
    - (iv) Antiviral medications may be considered.Consult MD/PA for treatment
- (2) Bacterial
  - (a) Inflammation of lungs caused by bacterial infection
  - (b) Caused by different organisms and can range in seriousness. Two common types of organisms are:
    - (i) Pneumococcal
    - (ii) Mycoplasma
  - (c) Symptoms include:

- (i) Rigors
    - (ii) Bloody sputum
    - (iii) Fever
    - (iv) Chest pain
  - (d) Provide care
    - (i) Treat with antibiotics as directed by MD/PA
    - (ii) Provide supportive treatment
- (3) Asthma
- (a) Chronic inflammatory disorder characterized by increasing responsiveness of the airways to multiple stimuli
    - (i) Most acute attacks are reversible and improve spontaneously or within minutes to hours with treatment
    - (ii) The recognition that asthma is a chronic inflammatory disorder of the airways has significant implications for diagnosis, management, and potential prevention
  - (iii) Asthma is common in adults and more common in children. Death rates from asthma have been increasing since 1990, despite improved therapies
  - (b) Occur spontaneously or can be triggered by:
    - (i) Respiratory infections
    - (ii) Exercise
    - (iii) Cold air
    - (iv) Smoke and other pollutants
    - (v) Stress or anxiety
    - (vi) Allergies
  - (c) Symptoms include:
    - (i) Tightness in chest
    - (ii) Audible expiratory wheeze
    - (iii) Tachypnea
    - (iv) Course breath sounds
    - (v) Prolonged expiration
    - (vi) Restlessness/anxiety
    - (vii) Paroxysmal cough progressing from dry and hacking to productive
    - (viii) Diaphoresis
  - (d) Identify key historical points
    - (i) Pattern of symptoms
      - \* Perennial
      - \* Seasonal
      - \* Perennial and seasonal
      - \* Continual
      - \* Episodic
      - \* Onset
      - \* Duration
      - \* Frequency
    - (ii) Aggravating factors
    - (iii) History of disease

- \* Age of onset and method of diagnosis
- \* Course of disease
- \* Present management and medications
- \* History of oral corticosteroid use
- \* Intensive care unit admissions
- \* History of intubation for asthma exacerbation
- \* Other medical diseases
- (iv) Family history
- (v) Social history
  - \* Condition of home
  - \* Exposure to allergens
  - \* Smoking
  - \* Identification of participating causes
- (vi) Medications used
- (e) Identify risk factors
  - (i) Past history of sudden severe exacerbations
  - (ii) Prior intubation for asthma
  - (iii) Prior admissions for asthma to an intensive care unit
  - (iv) Two or more hospitalizations for asthma in past year
  - (v) Three or more emergency care visits for asthma in past year
  - (vi) Use of more than two canisters per month
  - (vii) Current use of systemic Corticosteroids or recent withdrawal from systemic corticosteroids
- (f) Provide care
  - (i) Inhaled bronchodilators
  - (ii) Inhaled corticosteroids
  - (iii) Oral corticosteroids
  - (iii) Supportive care
    - \* Nebulization with inhaled sympathomimetics
    - \* Monitor pulse oximetry
    - \* Monitor BP and pulse after each nebulization
  - (iv) Yearly influenza vaccine
  - (v) Pneumococcal vaccine
  - (vi) Refer patient to MD/PA for treatment - medical emergency
- (g) Status asthmaticus- Severe prolonged asthma refractory to conventional modes of therapy. Management consists of:
  - (i) Oxygen therapy
  - (ii) Nebulization with inhaled bronchodilators
  - (iii) Intravenous corticosteroids
  - (iv) Intravenous fluids
  - (v) May progress to require endotracheal intubation and mechanical ventilation



**Administer prescribed inhaler**

- (1) Reassess patient history
- (2) If medication is not prescribed to that patient, gain permission from MD/PA or follow local SOP
- (3) Administration
  - (a) Patient should first inhale deeply
  - (b) Have patient place lips around opening of inhaler
  - (c) Press inhaler to activate the spray as the patient inhales deeply
  - (d) Patient should hold their breath as long as possible to ensure medication is absorbed
- (4) Verify effectiveness. Repeat second dose as needed and according to SOP or MD/PA

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## TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms, You encounter a casualty complaining of gastrointestinal symptoms. No other injury(ies) are present. Treat gastrointestinal symptoms IAW cited references.

### **General assessment**

#### **Take focused history for gastrointestinal symptoms**

- (1) OPQRST
  - (a) O-Onset
  - (b) P-Provoking/palliative factors
  - (c) Q-Quality
  - (d) R-Region/Radiation
  - (e) S-Severity
  - (f) T-Time
- (2) Allergies
- (3) Medications
- (4) Past medical history/past surgical history
- (5) Previous history of similar events
- (6) Nausea/ vomiting
- (7) Change in bowel habits/ stool
  - (a) Constipation
  - (b) Diarrhea
- (8) Weight loss/ Appetite changes
- (9) Last meal
- (10) Chest pain
- (11) Urinary symptoms- burning on urination, frequency
- (12) Fever, shakes, chills

#### **Abdominal examination**

Note: The abdomen is divided into four quadrants by imaginary lines crossing at the umbilicus — the Right Upper Quadrant (RUQ), Left Upper Quadrant (LUQ), Right Lower Quadrant (RLQ), and Left Lower Quadrant (LLQ)

- (1) Inspection: check for scars, bruising, rashes, dilated veins, umbilical hernia or abdominal distention (swelling)
- (2) Auscultation: listen for bowel sounds. An arterial bruit (a vascular murmur like sound) may be heard and is always abnormal. Bowel sounds may be present, hyperactive, or absent. If sounds are not heard in five minutes of continuous auscultation, consider them absent.
- (3) Percussion: begin to percuss the liver down from the right upper chest. Liver dullness begins around the 5th or 6th rib extending

- down to the costal (rib) margin. Liver length is usually less than 15 cm.
- (4) Palpation: palpate superficially (lightly) and deeper in all quadrants with the patients knees bent to relax the abdominal wall muscles. Assess for tenderness in all 4 quadrants. (will add picture for students)
- (a) RUQ: palpate for the liver during inspiration, usually not palpated. If enlarged, you will feel the edge of the liver as it passes beneath the fingers.
- (b) LUQ: palpate for the spleen on inspiration, usually not palpable.
- (c) RLQ and LLQ: palpate for tenderness (pain increased by pressure). Check for involuntary guarding (tightness of the abdomen), and for rebound tenderness by quickly releasing pressure from the abdomen. Check for peritoneal irritation using the heeltap test.
- (5) Rectal Exam: with the patient standing while bending at the waist or curled on his/her side and using a glove and lubricant, slowly insert your index finger. Check the prostate anteriorly (in males) and obtain a stool specimen for blood and test using the hemocult test. This may be outside the scope of 91W.
- (6) The Routine Abdominal Examination:
- (a) Inspect abdomen
- (b) Auscultate all four quadrants
- (c) Percuss liver size
- (d) Palpate for enlarged liver
- (e) Rectal examination for blood in stool
- (f) ALWAYS include cardiac and respiratory examination when performing an abdominal examination
- (g) ALWAYS consider whether a male or female genital examination by a M.D./P.A. may be required for complete assessment for the patient. All patients with abdominal pain require genital exam.

#### **Assess for abdominal pain**

- (1) Types of abdominal pain
- (a) Somatic pain – Sharp, localized pain that originates in the peritoneal walls. Often described as a stabbing or burning pain
- (b) Visceral pain – Poorly localized pain that originates in the walls of hollow organs. Often described as a vague, dull or cramping pain
- (c) Referred pain – is pain that is felt at a location removed from the diseased organ that is causing pain

**Identify and manage specific gastrointestinal illness**

**Upper Gastrointestinal (GI) Disease**

- (1) Gastroenteritis: an acute syndrome characterized by inflammation of the stomach and intestinal tract. Viral or bacterial infections are the most common cause of acute gastroenteritis
  - (a) Signs and symptoms
    - (i) Nausea, vomiting and diarrhea-may be mild or severe
    - (ii) Fever- may or may not be present
    - (iii) Abdominal cramping. Normal to increased bowel sounds
    - (iv) Rectal examination may show blood in the stool
    - (v) May become dehydrated if fluid loss is severe
  - (b) Treatment:
    - (i) Rest
    - (ii) Correct fluid loss- either orally or with IV hydration
    - (iii) If vomiting is severe, control with an antiemetic, either orally or by intravenous injection at direction of physician. Contraindicated with invasive organisms.
    - (iv) Refer to a MD/PA for further care, especially when fever, severe abdominal pain or rectal blood is present
- (2) Upper GI Bleeding
  - (a) The vomiting of blood (hematemesis), passage of black tarry stool (melena), or occult chronic bleeding from the GI tract
  - (b) Caused by a number of factors such as: cancerous tumors, peptic ulceration, erosive gastritis, and esophageal varices
  - (c) Signs and symptoms: the manifestations of GI bleeding depend on the source, rate of bleeding, and underlying or coexistent disease. Patients with chronic blood loss may present with symptoms and signs of anemia (e.g., weakness, easy fatigability, pallor, chest pain, and dizziness) or chronic rectal bleeding.
  - (d) Treatment
    - (i) Hematemesis or melena is a medical emergency
    - (ii) Fluid resuscitation and treatment for shock are indicated
    - (iii) Refer to a PA/MD for more definitive care
    - (iv) Evacuate as soon as possible
- (3) Peptic Ulcer Disease: erosion of the lining of the stomach or duodenum as a result of gastric acid hyperacidity
  - (a) Risk factors- stress, diet, alcohol, caffeine, drugs (ASA, NSAIDs), tobacco, H. Pylori infection and heredity
  - (b) Signs and symptoms

- (i) Epigastric pain 45-60 minutes after a meal
- (ii) May be nocturnal — becoming most severe between midnight and 0200 hrs.
- (iii) Pain, described as burning, may be relieved by food or antacid intake
- (iv) Epigastric tenderness, occult blood on rectal exam if the ulcer is bleeding
- (v) UGI or endoscopy confirms the diagnosis
- (c) Treatment
  - (i) Restriction of coffee, tea, cola, alcohol, aspirin, NSAIDs and tobacco
  - (ii) Antacids: 30 ml P.O. 1 and 3 hours after meals and at bedtime, Cimetidine (Tagamet) 400 mg P.O. BID or 800 mg P.O. at bedtime.
  - (iii) Refer to MD/PA for full evaluation
- (4) Esophageal varices: An esophageal varix is a dilated vein of the esophagus. Primary causes of esophageal varices are alcohol consumption, portal hypertension, and the ingestion of caustic substances.
  - (a) Signs and symptoms: the physical findings in esophageal varices are:
    - (i) Hematemesis with bright red blood
    - (ii) Dysphagia (difficulty swallowing)
    - (iii) Burning or tearing sensation as the varices continue to bleed, irritating the lining of the esophagus
    - (iv) May exhibit classic signs of shock, including tachycardia, tachypnea and cool diaphoretic skin
  - (b) Treatment:
    - (i) Two large bore IV's
    - (ii) Treatment for shock and immediate evacuation to a definitive care facility
- (5) Esophageal reflux: "Gastroesophageal Reflux Disease" (GERD) is a term applied to the symptoms of tissue damage caused by the reflux of gastric contents (usually acidic) into the esophagus
  - (a) Signs and symptoms
    - (i) Heartburn, burping, regurgitation — worse when lying down, frequently severe substernal pain, occurring 30 — 60 minutes after eating
    - (ii) May manifest as laryngitis, chronic cough due to aspiration of gastric contents
    - (iii) The physical exam is usually normal
    - (iv) Cardiac disease MUST be ruled out prior to a diagnosis of reflux esophagitis is given
  - (b) Treatment:
    - (i) Weight reduction if obese
    - (ii) Avoid eating near bedtime
    - (iii) Antacids after meals and at bedtime
    - (iv) Avoid tobacco, alcohol and caffeine

- (v) Elevation of the head of the bed with 6 inch blocks helps
- (vi) Avoid large meals
- (vii) Tagament, Zantac, and Prilosec are oral medications to be used to reduce acid reflux

#### Lower Gastrointestinal (GI) Disease

- (1) Constipation: considered if defecation is delayed for days beyond the patients normal, or if the stools are unusually hard, dry, and difficult to move
  - (a) Signs and symptoms: difficulty or straining on defecation, occasionally with abdominal cramping. Usually no severe pain, nausea, vomiting or blood in stools. Normal bowel sounds on physical examination. Usually has no bleeding on hemocult rectal exam.
  - (b) Treatment: increase intake of water and fiber (fruits, bulky vegetables, and bran cereals. Daily exercise. Metamucil 2 tsp. in water or juice 2 —3 x qd Milk of Magnesia 2 tsp. at Hs Bisacodyl (Dulcolax) 10 — 15 mg orally or suppository one rectally at hs, Fleets enemas.
- (2) Diarrhea: frequent passage of unformed watery bowel movements. May be due to viral, bacterial or parasitic infections
  - (a) Four basic mechanisms of diarrhea
    - (i) Increased intestinal secretion
    - (ii) Decreased intestinal absorption
    - (iii) Increased osmotic load
    - (iv) Abnormal intestinal motility
  - (b) Signs and symptoms
    - (i) Frequent, loose or watery stools
    - (ii) Change in consistency
    - (iii) Bloody (refer to Colitis) or nonbloody
    - (iv) Mucus
    - (v) Pus
    - (vi) Fatty materials, oil, grease (stools will float if high in fat)
    - (vii) Character and volume
      - \* Describe the stools appearance: watery, bloody, or black and tar-like?
      - \* How long does it last? Number of bowel movements per day?
      - \* Do you have cramping associated with the bowel movement
  - (c) Etiology
    - (i) Can be caused by nerves, viral, or bacterial infection
    - (ii) Nocturnal diarrhea may suggest organic disease of the bowel
    - (iii) Toxic substances
    - (iv) May be found in family history of GI disorders

- (v) Different food or water as in history of travel
  - (vi) Poor water or food sanitation or poor hygiene (Food Poisoning)
  - (vii) Sexual transmission
  - (viii) May have fever associated with dehydration
  - (ix) Determine circumstances surrounding the onset
    - \* **Acute diarrhea** - usually caused by infection; chronic may be caused by systemic illness; intermittent by psychological factors: Did it begin rapidly or gradually?; Were you under any stress at the time of onset?; What foods did you eat before it began?; Have you recently changed your diet?; Any travel history? Camping? Deployment?
    - \* **Chronic**: when do you last recall not having the symptom?
    - \* **Intermittent**: How long do intervals between episodes last?; Does diarrhea alternate with constipation?
- (d) Treatment
- (i) Dictated by cause when known
  - (ii) Clear liquids for 24 hours, then diet as tolerated
    - \* Replacing lost fluid and electrolytes is the most important therapeutic measure in acute diarrhea
    - \* If patient is significantly dehydrated, start IV fluid
    - \* If patient is not vomiting and mild dehydration: oral rehydration
  - (iii) Avoidance of agents that worsen diarrhea:
    - \* Caffeine
    - \* Dairy products
    - \* Raw fruits and vegetables
  - (iv) Kaopectate indicated only if illness and diarrhea continues
  - (v) May give Lomotil or Imodium if no blood in stool or no fever
  - (vi) If febrile or blood in stool, refer to MD/PA for antibiotic therapy and lab studies
  - (vii) Withhold food for 24 hrs — clear liquid diet only, force clear liquids. Kaopectate liquid: 2 tbs. after each loose bowel movement (or 2 tbs.). Refer to MD/PA if not improved.
- (3) Lower GI Bleeding
- (a) Signs and symptoms: Hematochezia (passage of bright red rectal blood), melena (dark or black tarry stool). 10% of hematochezia is due to an UGI bleed (Fast transit of blood)

- (b) Caused by a number of factors: colitis, malignancy, anorectal disease, inflammatory bowel disease, hemorrhoids
- (c) Treatment
  - (i) Hematochezia and melena are medical emergencies
  - (ii) Initiate two Large Bore IV's
  - (iii) Fluid resuscitation and treatment for shock are indicated
  - (iv) Referral to an MD/PA for definitive management
  - (v) Evacuate as soon as possible
- (4) Colitis: the term colitis applies to inflammatory diseases of the colon (e.g. ulcerative, granulomatous, ischemic, radiation, infectious colitis or irritable bowel syndrome)
  - (a) Signs and symptoms: bloody diarrhea of varied intensity and duration is interspersed with asymptomatic intervals. Usually an attack begins insidiously, with increased urgency to defecate, mild lower abdominal cramps, and blood and mucus in the stools. However, an attack may be acute and fulminant, with sudden violent diarrhea, high fever, signs of peritonitis, and profound toxemia. Some cases develop following a documented infection (e.g., amebiasis, bacillary dysentery).
  - (b) Treatment: dependent on diagnosis. Initial onset to be considered a medical emergency. Refer to MD/PA for management
- (5) Appendicitis: obstruction of the appendix by a fecalith, inflammation, foreign body or tumor
  - (a) Signs
    - (i) Classic presentation: Anorexia and pain in the epigastric or periumbilical area of the abdomen that evolves into pain in RLQ over 8 hours, often, signs and symptoms do not follow classic presentation
    - (ii) Nausea, diarrhea, and vomiting may accompany pain. Occasionally, constipation is present. The pain is moderately severe and after several hours localizes to the RLQ
    - (iii) Acute abdomen
    - (iv) Patient often will point precisely to the RLQ area of pain (positive McBurney's sign)
  - (b) Symptoms
    - (i) Abdominal tenderness
    - (ii) Fever may be present
    - (iii) Decreased bowel sounds if perforated
    - (iv) Rebound tenderness
    - (v) Rovsing sign (peritoneal irritation producing right lower quadrant pain with palpation of the left lower quadrant)



- (vi) Psoas sign (pain with active flexion against resistance or passive extension of the right hip)
  - (vii) Obturator sign (pain with passive internal rotation of the flexed right hip)
  - (viii) Voluntary or involuntary guarding
  - (ix) Rectal tenderness is common
  - (c) Treatment: Appendicitis is a surgical emergency. Refer to PA/MD and evacuate immediately
- (6) Diverticular Disease: typically presents with left lower quadrant pain and tenderness, similar to the right-sided pain and tenderness of appendicitis
- (a) Signs and symptoms:
    - (i) Abdominal pain, usually in the left lower quadrant
    - (ii) Nausea and vomiting
    - (iii) Constipation
    - (iv) Diarrhea
    - (v) Left lower quadrant tenderness, guarding, rebound
    - (vi) Fever
    - (vii) General peritonitis with tachycardia, high fever, and sepsis if colonic perforation occurs
  - (b) Treatment
    - (i) Diverticular disease is primarily a clinical diagnosis
    - (ii) Outpatient treatment: bowel rest and broad-spectrum oral antibiotic therapy. Patients are instructed to limit activity and maintain a liquid diet for 48 hours. If symptoms improve, low-residue foods are added to the diet.
    - (iii) If patient demonstrates signs of toxicity: fever, tachycardia, leukocytosis and severe abdominal pain, intravenous antibiotics are administered (authorized by MD/PA)
- (7) Bowel Obstruction: complete arrest or serious impairment of the passage of intestinal contents caused by a mechanical blockage. Mechanical obstruction is divided into obstruction of the small bowel, including the duodenum, and the large bowel. Major causes are hernia and adhesions
- (a) Signs and symptoms:
    - (i) Obstruction of the small bowel is based on a triad of symptoms:
      - \* Abdominal cramps are centered around the umbilicus or in the epigastrium; if cramps become severe and steady, consider strangulation (lack of blood flow to the bowel)
      - \* Vomiting starts early with small-bowel and late with large-bowel obstruction

- \* Constipation occurs with complete obstruction, but diarrhea may be present with partial obstruction
- (ii) Obstruction of the large bowel: symptoms usually develop more gradually than with small-bowel obstruction. Increasing constipation leads to obstipation and abdominal distention. If the ileocecal valve is competent, there may be no vomiting; if it allows reflux of colonic contents into the ileum, vomiting may occur (usually several hours after onset of symptoms). Lower abdominal cramps unproductive of feces are present.
- (b) Treatment
  - (i) A nasogastric tube is inserted and placed on suction
  - (ii) An inlying bladder catheter helps monitor urinary output
  - (iii) IV hydration
  - (iv) Complete obstruction is treated surgically after supportive therapy has been initiated
  - (v) Bowel obstruction should be considered a surgical emergency. Refer patient to an MD/PA and evacuate immediately
- (7) Hemorrhoids: a varicose vein in the lower rectum or anus. Caused by straining at stool, constipation, prolonged sitting and a diet poor in fiber.
  - (a) Signs and symptoms: itching, irritation and bleeding with bowel movements. Obvious external hemorrhoid or internal hemorrhoids found on rectal examination. Mucoid discharge from rectum
  - (b) Treatment: high roughage/fiber diet. Sitz bath (sitting in warm water reduces pain and swelling). Metamucil 2 tsp. in water or juice 1-3 times daily. Anusol or Anusol HC suppositories for internal hemorrhoids can be given two-three times a day.
  - (c) Complications: A thrombosed hemorrhoid is caused by the rupture of a vein, forming a clot in the subcutaneous tissue. A tender bluish mass is visualized. Thrombosed hemorrhoids require evaluation by an MD/PA.

#### **Liver, Biliary Tract and Pancreatic Diseases**

- (1) Hepatitis
  - (a) Hepatitis is a liver inflammation that stems from a virus or hepatotoxic agent
  - (b) Viral hepatitis is the most common of the serious, contagious diseases caused by a virus that attacks the liver

- (c) Hepatitis B & C are classified as sexually transmitted diseases
- (d) Types
  - (i) Hepatitis A - formerly called infectious hepatitis
    - \* Ranks as most common type of hepatitis
    - \* Highly contagious
    - \* Transmitted primarily in food handled by individuals in the infectious stages of the disease is very contagious and often spread within families
    - \* Public health problems occur from contaminated shellfish after raw sewage releases and accidents as well as, from commercial food handlers
    - \* Acute onset
    - \* No treatment has been shown to alter the disease course
    - \* Immunization: An inactivated hepatitis A vaccine is available, Prophylactic IG may be administered within two weeks after exposure to hepatitis A, Persons traveling to Africa, the Middle East, Central and South America, and Asia should be immunized FEMA team personnel should be offered vaccine if they travel out of the United States
  - (ii) Hepatitis B - formerly called serum hepatitis; most serious form
    - \* A prominent source of acute/chronic hepatitis and cirrhosis of the liver
    - \* Hepatitis B virus is very hardy, the virus' ability to survive outside its normal environment for an extended period of time demonstrates the need for appropriate application of universal precautions
    - \* Signs and symptoms are vague and can be mistaken for influenza or the common cold (fatigue, gastrointestinal disorders, headaches)
    - \* In prehospital care workers, needle stick injuries, mucous membrane contact and open lesions of the skin are the primary mode
    - \* Needle stick injuries are the most common cause of contraction

- \* Workers are at risk of HBV infection to the extent they are exposed to blood and body fluids
- \* Modes of transmission are preventable by the application of engineering controls, proper work practices (universal precautions), and HBV vaccination
- \* Prophylaxis: Hepatitis B vaccine before exposure and Hepatitis B immune globulin after exposure
- (iii) Hepatitis C - formerly called non A, non B hepatitis
  - \* Transmission: transfused blood (most common), body fluids
  - \* Individuals at high risk for developing hepatitis C include: Intravenous drug users, renal dialysis patients, multi-transfused patients, hemophiliacs
  - \* Prevention: clean water supply, safe disposal of human waste, hygienic handling of food, good personal hygiene, and medical prophylaxis includes active immunization with Immunoglobulin (1g)
  - \* Treatment: no specific treatment or drug can kill the hepatitis viruses
- (3) Acute pancreatitis: inflammation of the pancreas- alcoholism accounts for 80% of all causes
  - (a) Signs and symptoms
    - (i) Abrupt onset of epigastric pain, radiating to back
    - (ii) Nausea, vomiting, sweating, weakness
    - (iii) Abdominal tenderness and distention
    - (iv) Fever
    - (v) May have a history of previous episodes, often related to alcohol abuse
    - (vi) Jaundice may occur – may be caused by stones
  - (b) Treatment:
    - (i) NPO until patient is pain free
    - (ii) Nasogastric suction
    - (iii) IV hydration
    - (iv) Bed rest
    - (v) Pain control with narcotics IV (by MD/PA order)
    - (vi) Refer patient to MD/PA
    - (vii) Evacuate as soon as possible
- (4) Acute Cholecystitis: acute inflammation of the gallbladder wall, usually as a response to cystic duct obstruction by a gallstone
  - (a) Signs and symptoms

- (i) Steady, severe pain and tenderness in the right upper quadrant or umbilical area. Acute attack is often precipitated by a large, fatty meal.
    - (ii) Nausea and vomiting
    - (iii) Painful splinting of respiration during deep inspiration and right upper quadrant palpation (Murphy's sign) is frequent
    - (iv) Fever
  - (b) Treatment
    - (i) NPO
    - (ii) IV hydration
    - (iii) Pain control with narcotics IV (by MD/PA order)
    - (iv) IV antibiotics – as directed by MD/PA
    - (v) Cholecystectomy usually performed 2-3 days after acute episode subsides
    - (vi) Refer patient to MD/PA
    - (vii) Evacuate as soon as possible
- (5) Cholelithiasis: formation or presence of calculi (gallstones) in the gallbladder.
  - (a) Signs and symptoms
    - (i) The clinical consequences of stone formation in the gallbladder are exceedingly variable. Most patients remain asymptomatic for long periods, frequently for life.
    - (ii) Persistent obstruction usually produces inflammation and acute cholecystitis. Stones in the duct cause colicky pain associated with peristaltic motion.
  - (b) Treatment: symptomatic gallstones - biliary colic recurs with irregular, pain-free intervals of days or months. Symptomatic patients are at increased risk of developing complications, and cholecystectomy is indicated. Refer to PA/MD and evacuate.

## TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction, and ventilation equipment (if available), selected medications, and documentation forms. You encounter a casualty complaining of genitourinary problems. No other injury(ies) are present. Performed initial management interventions for genitourinary symptoms identified during focus history and exam.

### **Recognize specific illnesses**

#### **Cystitis**

- (1) Definition - inflammation of the urinary bladder  
  
Urine is normally sterile. Bacteria reach the bladder by way of infected kidneys, lymphatics, and the urethra. Because the urethra is short in women, ascending infections are more common in women.
- (2) Causes
  - (a) Fecal contamination
  - (b) Catheters
  - (c) Sexual intercourse - occurs after long periods without sexual intercourse. Also called "Honeymoon cystitis"
- (3) Symptoms
  - (a) Urgency (a feeling of the need to void although the bladder is not full)
  - (b) Frequency
  - (c) Dysuria (painful urination)
  - (d) Perineal and suprapubic pain
  - (e) Hematuria
  - (f) Chills and fever are rare, but may indicate a more serious illness
- (4) Diagnosis
  - (a) Patient's history and physical examination
  - (a) Urinalysis, urine culture and sensitivity (C&S)—may show an increase in the number of red and white cells, as well as the causative microorganism
- (5) Treatment
  - (a) Increase fluid intake
  - (b) Identify and correct contributing factors
  - (c) Antimicrobial therapy as prescribed by the MD/PA
  - (d) Urinary (Pyridium) for dysuria

#### **Urethritis**

- (1) Definition - inflammation of the urethra, more common in men than in women
- (2) Causes
  - (a) If caused by organisms other than gonorrhea--it is known as nonspecific urethritis (NSU)

- (b) Gonorrhea causes a specific form of infection that can attack the mucous membrane of the urethra
  - (c) Urethritis may accompany cystitis in women
  - (d) Nonspecific urethritis in men caused by:
    - (i) Irritation during vigorous intercourse
    - (ii) Intercourse with an infected partner
    - (iii) Most common cause of urethritis is caused by chlamydia trachomatis
- (3) Symptoms
- (a) Dysuria - ranging from slight tickling to burning or severe discomfort
  - (b) Urinary frequency
  - (c) Fever is NOT common and implies a more serious infection to prostate, testes, and epididymis in males
  - (d) Urethral discharge
- (4) Diagnosis
- (a) Patient's history and symptoms
  - (b) In men, urethral smear (gram stain)/ C & S to identify causative organism
  - (c) In women, clean catch urinalysis
- (5) Treatment
- (a) Antibiotic therapy as prescribed by the MD/PA. Depending on organism must involve MD/PA as treatment needs to be tailored and treatment of syphilis is also required in many cases.
  - (b) Increase fluid intake
  - (c) Analgesics for pain/discomfort

### **Pyelonephritis**

- (1) Definition - infection of the renal parenchyma (the functional tissue of an organ as distinguished from supporting or connective tissue) and the lining of the collecting system
- (2) Causes
  - (a) Acute pyelonephritis
    - (i) Associated with diabetes, pregnancy and extremes of age
    - (ii) Bacterial infection such as E-coli, streptococcus, pseudomonas, and staph aureus
    - (iii) More common causes are bladder instrumentation, neurogenic bladder, and inability to completely empty the bladder
  - (b) Risk factors
    - (i) Diabetes
    - (ii) Pregnancy
    - (iii) Recent instrumentation
    - (iv) Extremes of age
- (3) Symptoms
  - (a) Acute pyelonephritis
    - (i) Flank pain

- (ii) Chills, fever, and malaise
  - (iii) Frequency and burning on urination may be present if bladder is also infected.
  - (iv) Nausea and vomiting, dehydration with secondary
  - (v) Headache
- (4) Diagnosis
- (a) Urinalysis positive for leukocyte (WBC's) casts
  - (b) Positive urine culture
  - (c) Physical examination reveals CVA (costovertebral angle) or flank tenderness
- (5) Treatment
- (a) Symptomatic treatment for fever and pain
  - (b) Antibiotic therapy prescribed by MD/PA. May consider ampicillin, gentamycin or fluoroquinolone (Cipro/Levaquin)
  - (c) Liberal oral fluid intake, if unable to tolerate fluids IV hydration and antibiotics
  - (d) Relief of any urinary obstruction
  - (e) All patients need to be evaluated by a physician

**NOTE:** Damage to the kidney can be life threatening if not treated promptly.

- (6) Discharge Teaching
- (a) Follow diet and fluid regime as prescribed
  - (b) Take medications exactly as directed
    - (i) Do not omit or discontinue medication unless told by the physician
    - (ii) Do not take nonprescription drugs unless cleared by the physician

#### **Infections of the female reproductive system**

- (1) Vaginitis
- (a) Definition - inflammation of the vagina (The normal acidity of the vaginal secretion is a natural defense against infection but, if infected by certain pathogenic organisms, an infection results)
  - (b) Causes
    - (i) Bacteria- most common
    - (ii) Trichomonas vaginalis - a protozoan
    - (iii) Candida albicans – yeast (fungal)
  - (c) Facts
    - (i) Commonly occurs during pregnancy and after antibiotic therapy
    - (ii) Frequently seen in women with diabetes
    - (iii) Vaginitis may persist for years
    - (iv) Factors that influence the development of a vaginal infection include
      - \* A change in the vaginal ph.



- \* Hormonal changes during the menstrual cycle, pregnancy or for any other reason (such as taking steroids).
  - \* Long-term use of birth control pills
  - \* Use of systemic antibiotics
  - \* Compromised immunity
- (d) Types of Vaginitis:
- (i) Bacterial Vaginosis (BV)
    - \* Known as nonspecific vaginitis.
    - \* Caused by a combination of organisms.
    - \* Increased discharge (white, yellow or gray) with a "fishy" odor.
    - \* Redness or edema not significant.
    - \* May be sexually transmitted
  - (ii) Trichomonas Vaginalis (Trichomoniasis) - a sexually transmitted disease
  - (iii) Candidiasis albicans— "typical yeast infection" may be a sexually transmitted disease
- (e) Signs and symptoms
- (i) Leukorrhea - whitish or yellow white vaginal discharge
  - (ii) Discharge may be frothy or thick
  - (iii) Odorous and profuse discharge (more so in trichomoniasis)
  - (iv) Perineal, vaginal and urethral burning and itching
  - (v) Possible discomfort in lower abdominal region
  - (vi) Redness or rash around vagina
  - (vii) Painful intercourse
  - (viii) Occasionally asymptomatic

**NOTE:** Diagnosis is made upon microscopic examination of the vaginal discharge (usually a wet prep/KOH) and normal saline.

- (f) Treatment
- (i) Metronidazole (Flagyl) if BV or trichomoniasis infection - dose 250mg po tid x7 days or 2gm po in single dose. Instruct patient not to drink alcohol while taking Flagyl and for three days after completion of therapy. Using together will cause nausea, vomiting, headache, cramps and flushing)
  - (ii) Nystatin cream (Mycostatin, Nilstat); Miconazole (Monistat, Micatin) Clotrimazole (Mycelex) if candida infection
  - (iii) If has glycosuria (glucose in urine), patient will need work-up to rule out the diagnosis of diabetes mellitus

- (iv) Women with any of the following clinical situations should notify the physician at the first sign of a vaginal infection
  - \* First vaginal infection
  - \* Unsure if it is a yeast infection
  - \* High risk for HIV or AIDS
  - \* Diabetic
  - \* Temperature over 100 degrees
  - \* Under 12 years of age
  - \* Pregnant
  - \* New onset pain especially lower abdomen, back, or shoulder
  - \* Malodorous vaginal discharge
- (2) Pelvic Inflammatory Disease (PID)
  - (a) Definition - an infection or inflammation of the ovaries, fallopian tubes, uterus, or pelvic cavity
  - (b) Causes and transmission
    - (i) Infection usually enters the pelvic organs (uterus fallopian tubes, ovaries) through the cervix and vagina
    - (ii) Organisms commonly associated with causing PID are N. gonorrhea and Chlamydia
  - (c) Signs and symptoms
    - (i) Foul-smelling vaginal discharge
    - (ii) Back ache
    - (iii) Pelvic pain
    - (iv) Abdominal pain
    - (v) Fever, chills, malaise
    - (vi) Nausea, vomiting
    - (vii) Menorrhagia
    - (viii) Dysmenorrhea
    - (ix) Dyspareunia
  - (d) Risk factors
    - (i) Multiple sexual partners
    - (ii) History of STDs in the past
    - (iii) Frequent vaginal douching
    - (iv) IUD (intrauterine device for contraception)- highest risk first four months after insertion
    - (v) Younger age
  - (e) Diagnosis
    - (i) Based on symptoms and physical exam findings-lower abdominal pain is the most frequent presenting complaint
    - (ii) Wet prep (saline/KOH (potassium hydroxide) of vaginal secretions)
    - (iii) Culture and sensitivity of vaginal discharge to determine causative organism
    - (iv) Ultrasound if available
    - (v) This is a cause of serious illness and death if not treated quickly and properly – Patient may

- develop toxic shock syndrome that can be rapidly fatal.
- (f) Treatment
  - (i) Serious illness that requires hospitalization for administration of IV antibiotics and supportive care Patient must be treated quickly and properly.
  - (ii) IV antibiotics as prescribed by the MD/PA
  - (iii) During the active disease process, douches and sexual intercourse should be avoided
  - (iv) Remove IUD if in place
- (g) Discharge Teaching:
  - (i) Both sex partners must be instructed to take their prescribed medications even though one partner may be asymptomatic

### **Kidney Stones**

- (1) Stones form throughout the urinary system. Patients usually present when the stone has migrated into a ureter
- (2) Cause
  - (a) Dehydration
  - (b) Increase in minerals in water supply
  - (c) Occurs three times more often in males than females
- (3) Symptoms
  - (a) Acute onset of severe flank pain
  - (b) Flank pain radiates to the groin, scrotum or labia
  - (c) Nausea, vomiting, secondary dehydration, anxious
  - (d) Cool clammy skin, diaphoresis, tachycardia and increased blood pressure due to severe pain
  - (e) Hematuria with dysuria, urinary frequency
- (4) Diagnosis
  - (a) Urine analysis – hematuria
  - (b) Physical assessment - acute CVA /flank tenderness on affected side
  - (c) Fever and/or hypotension are unusual and would suggest possibility of infection or diagnosis other than renal colic
- (5) Differential Diagnosis
  - (a) Aortic dissection
  - (b) Abdominal aortic aneurysm
  - (c) Renal obstruction
  - (d) Acute myocardial infarction
  - (e) Acute abdomen
- (6) Treatment
  - (a) Pain control-IV narcotics almost always required
  - (b) IV hydration
  - (c) Strain all urine to recover stone, if passed
  - (d) Refer immediately to nearest MTF for management

**Acute scrotal pain**

- (1) Differential Diagnosis
- (a) Testicular torsion
- (i) Cause
- \* History of athletic event or trauma
- (ii) Symptoms
- \* Pain is sudden and severe with radiation into abdomen
- (iii) Diagnosis
- \* Malpositioned testes-lateral orientation and elevated
  - \* Ultrasound
- (vi) Treatment
- \* Immediate referral to the nearest treatment facility
  - \* Manual detorsion of the affected testis may be attempted. This is accomplished standing at the foot of or on the right side of the patient's bed. The torsed testis is detorsed in a fashion similar to "opening a book". That is, the patient's right testis is rotated in a counterclockwise fashion and the patient's left testis in a clockwise fashion.
  - \* Surgical Emergency – patient will lose testicle if torsion is not corrected
- (b) Epididymitis
- (i) Cause
- \* Bacterial infection, often STD
  - \* Urinary tract infection
  - \* Prostatitis
  - \* Prolonged use of indwelling catheters
- (ii) Signs and symptoms
- \* Pain more gradual than onset of torsion
  - \* Causes lower abdominal, inguinal and scrotal or testicular pain alone or in combination
- (iii) Diagnosis
- \* Painful urination
  - \* Transient relief of scrotal/testicular pain in the recumbent position with scrotal elevation
  - \* Pyuria (WBC's and bacteria) on urinalysis
  - \* Epididymis tender on palpation. May feel like a 'bag of worms'
- (iv) Management

- \* Antibiotic therapy as prescribed by MD/PA
- \* Increase fluid intake – oral or IV
- \* Rest with scrotal elevation
- \* Oral analgesics

#### **Sexual Assault Assessment**

- (1) 5% of violent crimes in U.S.
  - (a) Much higher incidence in 3rd world countries
  - (b) Grossly under reported
- (2) Assessment
  - (a) Assess for and treat any life-threatening injuries (compromised airway, hypovolemic shock)
  - (b) Provide "safe" environment –shield from other patients, visitors
  - (c) Avoid touching patient without permission
  - (d) Tell patient not to shower, bathe, change clothes or throw clothes away until examined by the physician. Evidence preservation is paramount.
  - (e) Notify MD/PA immediately

#### **Recognize Sexually Transmitted Diseases**

##### **Factors that contribute to Sexually Transmitted Diseases (STD)**

- (1) Unknown carrier of disease
- (2) Casual sex
- (3) Absence of laws that require reporting of ALL STDs
- (4) Length of time between exposure and appearance of symptoms (or positive antibody tests)
- (5) Failure to:
  - (a) Recognize signs and symptoms
  - (b) Seek early treatment
  - (c) Refrain from sexual activity until treatment complete
- (6) Lack of knowledge regarding STDs and their prevention
- (7) Failure of sexually active person to heed STD warnings

##### **Factors related to prevention and control of STDs**

- (1) Public education:
  - (a) School Systems
  - (b) Television and newspapers
- (2) Refrain from sexual activity until disease eradicated
- (3) Locate and treat contacts
- (4) Continued research
- (5) STD clinics

**Chlamydia (Appears 7-10 Days after exposure)**

- (1) Caused by the organism, Chlamydia trachomatis (parasite)
- (2) Signs and Symptoms
  - (a) Urethritis & epididymitis in men
  - (b) Cervicitis & mucopurulent discharge in women
  - (c) Some patients may be asymptomatic, especially women
  - (d) Can be transmitted from mother to infant at birth
  - (e) Additional problems
    - (i) Pelvic inflammatory disease
    - (ii) Ectopic pregnancy
    - (iii) Sterility
    - (iv) Systemic infections
- (3) Diagnosis
  - (a) Direct microscopic examination-will observe flagellated parasite
  - (b) Culture of secretions or tissue scrapings
- (4) Management
  - (a) Antimicrobials, such as tetracycline, erythromycin, sulfonamide as prescribed by MD/PA
  - (b) Explain the prescribed treatment
    - (i) Length of treatment is 7-21 days
    - (ii) Patient should refrain from sexual activity during treatment
  - (c) Referral to Preventative Medicine for reporting

**NOTE:** Treatment failure can be due to either reinfection or patient noncompliance with antimicrobial therapy.

**Gonorrhea**

- (1) Caused by the organism Neisseria gonorrhoea. Often co-exists with chlamydial infections.
- (2) Signs and Symptoms
  - (a) Appear 2 to 6 days after exposure
  - (b) Men
    - (i) Urethritis with a purulent discharge.
    - (ii) Pain on urination
    - (iii) May spread to prostate, seminal vesicles, epididymis
    - (iv) Sometimes there are no symptoms in men
    - (v) Gonococcal infection occur in the pharynx and rectum
  - (c) Women
    - (i) Vaginal discharge
    - (ii) Abnormal menstrual bleeding
    - (iii) Painful urination
    - (iv) 80% experience no symptoms
- (3) Diagnosis
  - (a) Gram stain and culture

- (b) In men, specimen of urethral discharge is obtained; anal and pharyngeal smears if person has practiced anal or oral sex.
- (c) In women, specimen obtained from cervix

**NOTE:** Lubricants are not used on speculum because these products may destroy the gonococci.

- (4) Management
  - (a) Antibiotics as prescribed by MD/PA. Rocephin 250 mg IM is usually effective treatment
  - (b) Explain the treatment regimen
  - (c) Explain the importance of contacting all sexual partners for examination and treatment
  - (d) Refrain from sexual activity until follow-up smears are negative
  - (e) Referral to Preventative Medicine for reporting

### Syphilis

- (1) Caused by spirochete, *Treponema pallidum*. If untreated, progresses through secondary & tertiary stages.
- (2) Signs and Symptoms
  - (a) Primary (early) stage (Appears 2-6 weeks after exposure)
    - (i) Chancre appears on genitals, anus, cervix, and other parts of body.
    - (ii) Chancre first resembles papule, later appears ulcerated, painless
    - (iii) Heals by itself in several weeks
  - (b) Secondary Stage: (Appears 2-6 weeks after primary stage)
    - (i) Fever
    - (ii) Malaise
    - (iii) Rash – most common manifestation
    - (iv) Headache
    - (v) Sore throat
    - (vi) Enlarged lymph nodes
  - (c) Tertiary Stage: Non-infectious – involvement of the nervous and cardiovascular systems
    - (i) May occur years after initial infection. Sometimes as much as twenty years later.
- (3) Diagnosis
  - (a) Lab tests (serum)
    - (i) VDRL - Venereal Disease Research Laboratory
    - (ii) RPR - Rapid Plasma Reagent
    - (iii) Fluorescent treponemal antibody absorption test
- (4) Management
  - (a) Explain the treatment regimen
  - (b) Instruct the patient to avoid intercourse until permitted
  - (c) Primary and secondary stages
    - (i) Penicillin G - drug of choice

- (ii) Tetracycline or erythromycin - if allergic to penicillin
- (iii) Follow-up examination at 3,6, & 12 months
- (d) Tertiary stage:
  - (i) Larger doses of penicillin G
  - (ii) Response is poor in patients with cardiovascular syphilis

### Herpes Genitalis

- (1) Caused by Herpes Simplex Virus
- (2) Signs and Symptoms
  - (a) Painful vesicular lesions on buttocks, penis, perineum, vulva, cervix, vagina (if transmitted by anal intercourse, lesions may appear in rectum and perianal area).
  - (b) Lesions may persist for several weeks
  - (c) Malaise
  - (d) Fever
  - (e) Chills
  - (f) Headache
  - (g) Reoccurrence in 60 – 90 % of patients
- (3) Diagnosis
  - (a) Examination of lesions-linear vesicles. Microscopic exam will show giant cells.
  - (b) Viral culture
- (4) Management
  - (a) Acyclovir (Zovirax) - oral, topical, intravenous

**NOTE:** Acyclovir may decrease the frequency and magnitude of reoccurrences.

- (b) Analgesics for pain and discomfort
- (c) If eye infection, use Vira-A, Herpes Liquafilm or Viroptic
- (d) Instruct the patient to use a condom at all times if there is a periodic reoccurrence of the lesions
- (e) Refrain from sexual intercourse or use a condom
- (f) Pregnant women must inform the physician if they have a history of herpes. Delivery during an active outbreak can be fatal to the infant.

### Genital Warts

- (1) Caused by human papilloma virus (HPV)
- (2) Signs and Symptoms
  - (a) Incubation period is normally 1-2 months, but may be longer
  - (b) Painless, soft, fleshy wart-like growths on the genitalia or cervix or in vagina
- (3) Diagnosis: visual examination
- (4) Management



- (a) No cure
- (b) RPR for syphilis
- (c) Treat with podophyllin, a topical solution that is left in place for 4-6 hours, and then washed off
- (d) Teach the patient to use a condom

**NOTE:** There appears to be an increased risk of cancer of the vulva, cervix, and vagina in women with genital warts.

### **Review Male and Female Catheterization**

#### **Urinary Catheterization**

- (1) Definition - Insertion of a catheter (tube for injecting or removing fluids) through the urethra into the bladder for the purpose of removing urine.
- (2) Purposes of Urinary Catheterization
  - (a) Relieve urinary retention
  - (b) Obtain sterile urine specimen from female
  - (c) Measure amount of residual urine in bladder (an amount greater than 50 ml is considered abnormal)
  - (d) Empty bladder before, during, and after surgery
  - (e) To obtain a urine specimen when a specimen cannot be obtained by any other means
- (3) Urinary Catheter Sizes
  - (a) The smaller the number, the smaller the catheter
  - (b) No. 8 Fr and 10 Fr - used for children
  - (c) No. 14 Fr and 16 Fr - used for female adult
  - (d) No. 18 Fr, 20 Fr - usually used for male adult

**NOTE:** Larger size catheter used for male because it is stiffer, thus easier to push the distance of the male urethra.

#### **Types of Urinary Catheters**

- (1) Intermittent catheter
  - (a) Used to drain bladder for short periods (5-10 min)
  - (b) Commonly used for self-catheterization by patients in the home environment (after proper amount of training)
  - (c) Commonly used with spinal cord injury patients
- (2) Indwelling/retention catheter
  - (a) Continuous bladder drainage
  - (b) Gradual decompression of over-distended bladder

**NOTE:** Do not remove more than 750cc to 1000cc of urine from the bladder at any one time. Gradual decompression will prevent bladder damage and shock.

- (c) Intermittent bladder drainage and irrigation
- (d) Drainage tube and collection device connected to this type of catheter

- (e) Most commonly used indwelling catheter is a Foley catheter
  - (i) Designed with balloon at distal tip which can be inflated with sterile water or saline
  - (ii) Inflated balloon keeps catheter from slipping out of bladder
- (3) Supra pubic catheter
  - (a) Inserted into bladder through small incision above pubic area
  - (b) Occasionally used for continuous drainage

#### **Procedure for the insertion of Foley Catheter in the male and female patient**

It is important to remember that the bladder normally is a sterile cavity and the external opening to the urethra can never be sterilized. Pathogens introduced into the bladder can ascend the ureters and lead to bladder and kidney infections.

- (1) Gather all equipment - wash hands
  - (a) Sterile catheterization kit
  - (b) Flashlight or lamp
  - (c) Urine collection bag
  - (d) Velcro leg strap or anchoring tape
  - (e) Disposal bag
  - (f) Waterproof pad or chux
- (2) Explain procedure to patient. He/she may experience a burning/pressure sensation as the catheter is inserted, and a feeling of needing to void, once catheter is in place
- (3) Provide for adequate lighting
- (4) Provide for privacy
- (5) Position patient
  - (a) Males - assist patient into supine position with thighs slightly apart. First place waterproof pad under patient's buttocks. Drape patient so only penis is exposed.
  - (b) Females - assist patient to dorsal recumbent position with knees flexed and about 2 feet apart. Females may also be positioned in the Sim's or lateral position with upper leg flexed. Place waterproof pad under patient.
- (6) Cleanse genital and perineal areas with soap and water. Rinse and dry. Wash hands.
- (7) Open sterile catheterization tray and supplies, using sterile technique.
- (8) Put on sterile gloves. Open sterile drape and place on patient's thighs. Place drape with opening over penis (males) or labia (females).
- (9) Place catheter set on or next to patient's legs on sterile drape.
- (10) For indwelling catheters, test catheter balloon:
  - (a) Attach pre-filled irrigation syringe to injection port
  - (b) Inject appropriate amount of fluid

- (c) If balloon inflates properly, withdraw fluid and leave syringe attached to port
- (11) Pour antiseptic solution over cotton balls
- (12) Lubricate catheter for about 6 to 7 inches (males) or 1-2 inches (females)
- (13) Insertion of Catheter
  - (a) Males
    - (i) Lift penis with non-dominant hand, which is then considered contaminated.
    - (ii) Retract foreskin in uncircumcised male
    - (iii) Cleanse area at meatus with a cotton ball that is held with forceps
    - (iv) Use circular motion, moving from meatus toward base of penis. Repeat this three times
    - (v) Hold penis with slight upward tension and perpendicular to patient's body
    - (vi) Instruct patient to bear down as if voiding
    - (vii) With dominant hand, place drainage end of catheter into receptacle (if pre-attached to drainage bag, place bag close to sterile field)
    - (viii) Insert catheter tip into meatus
    - (ix) Advance tip 6 to 8 inches until urine flows
    - (x) Do not use force to introduce catheter
    - (xi) For slight resistance, ask patient to take a deep breath and rotate catheter slightly
    - (xii) Once urine drains, advance catheter another 1/2 to 1 inch
    - (xiii) Inflate the balloon with the pre-filled syringe
  - (b) Females
    - (i) With thumb and one finger of non-dominant hand, spread labia and identify meatus. Maintain separation of labia with one hand
    - (ii) Using antiseptic soaked cotton balls held with forceps, cleanse area from clitoris toward anus, using a different sterile cotton ball each time—first to the right of the urinary meatus, then to the left of the urinary meatus then down the center over the urinary meatus. Discard each cotton ball after one downward stroke.
    - (iii) With sterile gloved hand, place drainage end of catheter into receptacle. (If pre-attached to drainage bag, place bag close to sterile field)
    - (iv) Insert catheter tip into meatus 2 to 3 inches or until urine flows.
    - (v) Do not use force to push catheter through urethra into bladder
    - (vi) For slight resistance, ask patient to take a deep breath and rotate catheter gently as it reaches external sphincter.

- (vii) Once urine drains, advance catheter 1/2 to 1 inch
- (viii) Inflate the balloon with the prefilled syringe
- (14) Check to insure balloon is properly filled:
  - (a) Tug gently on catheter to feel for resistance
  - (b) Attach catheter to drainage system if required
- (15) Secure catheter to upper thigh (males and females) or lower abdomen with penis directed toward patient's chest (males). Leave some slack in catheter to prevent tension.
- (16) Secure drainage bag below level of bladder. Check that tubing is not kinked and movement of side rails does not impede drainage.
- (17) Cleanse and dry perineal area
- (18) Remove equipment and make patient comfortable
- (19) Wash your hands
- (20) Document procedure in record
  - (a) Type and size of catheter
  - (b) Time of catheterization
  - (c) Amount of urine removed
  - (d) Description of urine
  - (e) Client's reaction to procedure
  - (f) Client's teaching and level of understanding

#### **Removing a Retention Bladder Catheter**

- (1) Assemble all equipment
  - (a) 10 cc syringe
  - (b) Waterproof drape
  - (c) Soap and water
  - (d) Exam gloves
  - (e) Privacy drape
- (2) Explain procedure to patient, and advise that he/she may feel a slight burning sensation during removal of the catheter and the first time or two that they void.
- (3) Provide for privacy and assist female patient to a dorsal recumbent position, or the male patient to a supine position.
- (4) Place waterproof drape under patient's buttocks and provide a drape for patient privacy.
- (5) Wash hands and don disposable gloves
- (6) Remove securing tape on catheter
- (7) Attach syringe to balloon valve and aspirate entire amount of water from balloon. Check size of balloon so you know how much to remove.
- (8) Encourage patient to take deep breath and relax while gently removing catheter per ward SOP. Wrap catheter in towel or disposable waterproof drape.
- (9) Clean the perineal area after the catheter is removed.
- (10) Remove gloves and wash hands
- (11) Reposition patient comfortably

- (12) Instruct patient to drink plenty of fluids, if appropriate. Record intake and output, and instruct patient regarding need to void into bedpan or urinal.
- (13) Inform patient that it may take a while for bladder to reestablish voluntary control, and that an accident is not unusual.
- (14) Discard equipment and return it to appropriate area
- (15) Record procedure, including the following
  - (a) Time of procedure
  - (b) Description and amount of urine in drainage bag
  - (c) Record all patient teaching accomplished and patient's level of understanding
- (16) Record and report any unusual signs to the charge nurse. These include, but are not limited to:
  - (a) Discomfort
  - (b) Bleeding
  - (c) Change in vital signs (Increased pulse/decreased BP)
  - (d) Increase in temperature
  - (e) Strong odor

**Care of the patient with an indwelling urinary catheter**

- (1) Catheter care
  - (a) Wash hands before and after catheter care
  - (b) Clean perineal area and proximal third of catheter twice a day and after bowel movements. Use soap and water, or designated solution per hospital SOP. Do not use powders or lotions, rinse well.
  - (c) Note color, character and odor of urine
    - (i) Empty catheter bag every 8 hours or as directed by SOP/physician's order
    - (ii) Ensure drainage spout does not contact contaminated surface.
    - (iii) Measure and record I&O as ordered
    - (iv) Observe patient for fever, chills or a sudden onset of pain
    - (v) Apply topical antibiotic ointment to meatus, as ordered
    - (vi) Check catheter frequently for patency and drainage of urine
    - (vii) Secure catheter to patient to avoid pulling or pressure
    - (viii) Clamp catheter temporarily if urine bag must be elevated higher than bladder. This prevents urine from draining back into bladder.
    - (ix) Drainage system tubing should extend straight down from bed to drainage bag

**NOTE:** Any loops hanging down from bed level may promote stasis of urine, leading to infection.

## TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, oxygen, suction and ventilation equipment (if available). You encounter a casualty with symptoms of a skin disorder. No other injury (ies) or anaphylaxis symptoms are present, treat skin disorders IAW *Basic Trauma Life Support*, *Emergency Care in the Streets*, *Adult Health Nursing*, *Basic Nursing: A Critical Thinking Approach*, *Habif's Clinical Dermatology*

### Assess for Skin Disorders

#### Temperature

#### Skin color

- (1) Lips
- (2) Oral membranes
- (3) Sclera
- (4) Conjunctiva
- (5) Palms and soles of feet

#### Skin integrity - palpate with gloved hands

- (1) Is the skin intact or not?
- (2) Texture (e.g., smoothness, and roughness)

#### Moist/dry

#### Skin lesion identification:

- (1) **Primary lesions** are early skin changes that have not yet undergone natural evolution or change caused by manipulation. These are the best clues to diagnosis.
  - (a) A macula is flat; color varies from white to brown to red to purple, and small (< 1 cm). A patch is a large macule (> 1 cm). Examples include freckles, flat moles, and tattoos.
  - (b) A papule is a solid, elevated lesion usually < 1 cm. A plaque is a plateau-like lesion > 1 cm or a group of confluent papules. Examples include warts, some moles and some types of skin cancer
  - (c) A nodule is a palpable, solid lesion >1-2 cm, elevated. Larger nodules (>2 cm) are called tumors. Examples include cysts or lipomas
  - (d) A vesicle is a circumscribed, elevated lesion containing serous fluid that is < 1 cm; if > 1 cm, it is called a bulla (blister). Vesicles or bullae are commonly caused by primary irritants, allergic contact dermatitis, physical trauma, sunburn, insect bites
  - (e) Pustules are superficial and elevated lesions containing pus < 1 cm. They may result from infection or seropurulent evolution of vesicles or bullae. Some causes are impetigo, acne and folliculitis
  - (f) Wheals (hives) are transient, elevated lesions caused by localized edema. Wheals are a common allergic reaction,

- e.g., from drug eruptions, insect stings or bites, or sensitivity to cold, heat, pressure, or sunlight.
- (g) Purpura is a general term referring to areas of extravasated blood. Petechiae are small-circumscribed punctate foci of extravasation, whereas ecchymoses (bruising) are larger confluent areas of extravasation. The term hematoma refers to an area of massive bleeding into the skin and underlying tissues
  - (8) Telangiectasias are dilated superficial blood vessels. They appear as red, threadlike lines. They may occur in certain systemic diseases or in long-term therapy with topical corticosteroids
- (2) Secondary lesions result when primary lesions undergo a natural evolution
- (a) Scales are particles of epithelium. Common scaling diseases are psoriasis and superficial fungal infections
  - (b) Crusts (scabs) consist of dried serum, blood, or pus. Crusting occurs in many inflammatory and infectious diseases
  - (c) Erosion is focal loss of part or all of the epidermis. It often occurs with herpes viral diseases
  - (d) Ulcers are focal loss of the epidermis and at least part of the dermis. When ulcers result from physical trauma or acute bacterial infection, the cause usually is apparent. Less obvious causes include chronic bacterial and fungal infections
  - (e) Excoriation is a linear or hollowed-out crusted area caused by scratching, rubbing, or picking
  - (f) Lichenification is a thickened skin area with accentuated skin markings
  - (g) Atrophy manifests as paper-thin, wrinkled skin. It occurs in the aged, after long-term use of topical potent corticosteroids, and sometimes after burns
  - (h) Scars are areas of fibrous tissue that replace normal skin after destruction of some of the dermis. Scars may be caused by burns or cuts or less commonly by systemic diseases

#### **Presence of skin lesions**

- (1) Identify type of lesion
- (2) Excretions
  - (a) Color, odor, amount
  - (b) Thick, oily etc.
- (3) Size, does it change over time?
- (4) Location

#### **Turgor and mobility**

- (1) Turgor checks the hydration status of the patient

- (2) Pinch skin to form dent on back of patient's hand, abdomen, or sternum. Release skin and note how long it takes to return to normal position

**Edema**

- (1) Common sites are - face, eyelids, ankles, feet, sacral and scapular area
- (2) Indications of edema are - skin puffiness, tautness, or hardness
- (3) Types of edema - press in on area with thumb for 5 seconds and release
  - (a) Trace or shallow - slight indentation that disappears (1+ second)
  - (b) Pitting - deep indentation that remains visible for several seconds (3-4 + seconds)
  - (c) Dependent - gravity causes fluid to pool in areas lowest to the earth.

**Identify and Manage Viral Disorders of the Skin**

**Herpes simplex:**

An infection from the herpes simplex virus (HSV) is characterized by one or many clusters of small vesicles filled with clear fluid on slightly raised inflammatory bases

- (1) Signs and symptoms
  - (a) The lesions may appear anywhere on the skin or mucosa but are most frequent around the mouth, on the lips, on the conjunctiva and in the genital area
  - (b) Incubation period is 2-20 days. Asymptomatic „carriers“ shed the virus and spread the disease
  - (c) After a prodromal period; tingling, discomfort or itching and small tense vesicles appear on an erythematous base
  - (d) Single clusters vary in size from 0.5 to 1.5 cm, but groups may coalesce
  - (e) The vesicles persist for a few days, and then begin to dry, forming a thin yellowish crust or ulcer
  - (f) Primary (initial) infection is generally the most severe, with fever, lymphadenopathy and urinary symptoms (if the outbreak is genital)
  - (g) A herpetic whitlow is a HSV infection of the fingers, resulting from an inoculation of HSV through a cutaneous break. Common in health care workers. Symptoms include swelling and pain over lesions around the finger nail.
- (2) Treatment
  - (a) Healing generally occurs in 8 to 12 days after onset
  - (b) Individual herpetic lesions usually heal completely, but recurrent lesions at the same site may cause atrophy and scarring



- (c) Antiviral medications (acyclovir) are used for initial outbreaks, recurrent infections and suppressive therapy
- (d) Secondary bacterial infections are treated with systemic antibiotics
- (e) Avoid sexual intercourse while genital lesions are present. Viral shedding may occur even if patient is symptom free.
- (f) Discuss condom usage with all genital herpes patients  
Refer the patient to a MD/PA for treatment

#### **Herpes zoster**

(Shingles) An infection with varicella-zoster virus primarily involving the dorsal root ganglia and characterized by vesicular eruption and neuralgic pain in the dermatome of the affected root ganglia

- (1) Signs and symptoms
  - (a) Pain along the site of the future eruption usually precedes the rash by 2 to 3 days
  - (b) Characteristic crops of vesicles on an erythematous base then appear, following the cutaneous distribution of one dermatome
  - (c) The involved zone is usually hyperesthetic, and pain may be severe
  - (d) Eruptions occur most often in the thoracic or lumbar region and are unilateral
  - (e) Lesions usually continue to form for about 3 to 5 days
  - (f) Crusting occurs by 7-10 days and resolves by 14-21 days
- (2) Treatment
  - (a) Locally applied wet compresses are soothing, but systemic analgesics are often necessary
  - (b) Oral antiviral medications are used for treatment of herpes zoster
  - (c) Refer the patient to a MD/PA for treatment

#### **Identify and Manage Bacterial Disorders**

##### **Cellulitis-**

An acute infection of the skin and subcutaneous tissues. It may arise from an entry of bacteria through the skin (i.e. laceration, puncture wound) or extension from an abscess. Cellulitis is a serious disease because of the possibility of the infection spreading to the lymphatic and blood systems resulting in bacteremia and sepsis.

- (1) Signs and Symptoms
  - (a) Infection is most common in the lower extremities
  - (b) The major findings are local erythema and tenderness, frequently with lymphangitis and regional lymphadenopathy
  - (c) The skin is hot, red, and edematous

- (d) Vesicles and bullae may develop and rupture, occasionally with necrosis of the involved skin
  - (e) Systemic manifestations (fever, chills, tachycardia) may precede the cutaneous findings by several hours, but many patients do not appear ill
  - (f) Local abscesses form occasionally, requiring incision and drainage
- (2) Treatment
- (a) Oral antibiotic therapy to cover streptococci and staphylococci is required as first line outpatient therapy. Keflex 500 mg four times a day or Dynapen 500 mg four times a day. For penicillin allergic patients; Erythromycin 500mg four times a day is generally used. Duration of therapy is 10-14 days.
  - (b) For severe infections, which require hospitalization, Ancef 2 grams intravenously four times a day is used. For penicillin allergic patients, clindamycin 150-300 mg intravenously is given
  - (c) Immobilization and elevation of the affected area help reduce edema, and cool, wet dressings relieve local discomfort
  - (d) Refer patient to MD/PA for treatment

**Impetigo: Impetigo is a superficial skin infection**

- (1) Signs and Symptoms: Impetigo may occur on normal skin, especially on the legs in children. Impetigo usually occurs near the lips or nasolabial folds
  - (a) Lesions initially are pea-sized papules, becoming vesicular and rupturing, leaving the classic „honey-colored crusts“
  - (b) Regional lymphadenopathy is seen in the majority of cases
  - (c) Constitutional symptoms are absent
- (2) Treatment
  - (a) Application of mupirocin ointment 3 times daily has been effective in treating impetigo
  - (b) Patients showing no response to mupirocin in 3 to 5 days should be treated systemically. Because most cases are caused by either streptococci or staph- erythromycin is the drug of choice. Adults are given 250 mg four times a day
  - (c) Impetigo is extremely contagious. Avoidance of patients' towels or linens is crucial to avoid the spread of infection
  - (d) Refer patient to MD/PA for treatment

**Cutaneous Abscesses:**

- (1) Signs and symptoms include localized collections of pus causing fluctuant soft tissue swelling surrounded by erythema.
- (2) Treatment

- (a) Incision of the fluctuant area, thorough draining of pus with meticulous probing
- (b) Pack the cavity loosely with a gauze wick that is removed 24 to 48 h later
- (c) Local heat and elevation may resolve tissue inflammation
- (d) Refer patient to MD/PA for incision and drainage

**Folliculitis:**

Superficial or deep bacterial infection and inflammation of the hair follicles

- (1) Signs and symptoms
  - (a) A superficial pustule or inflammatory nodule surrounding a hair follicle
  - (b) The condition may follow or accompany other skin infections
  - (c) Chronic low-grade irritation or inflammation without significant infection may occur when stiff hairs in the bearded area emerge from the follicle, curve, and reenter the skin (pseudofolliculitis barbae)
- (2) Treatment
  - (a) Topical antibiotics and antiseptics (e.g., chlorhexidine) may be useful adjuncts to systemic therapy but should not be used without concomitant systemic treatment
  - (b) Treatment with systemic antibiotics may be indicated
  - (c) Refer patient to MD/PA for treatment

**Furuncle (Boil)**

Acute, tender, perifollicular inflammatory nodules resulting from infection by staphylococci. The condition often occurs in healthy young persons.

- (1) Signs and symptoms
  - (a) Furuncles occur most frequently on the neck, breasts, face, and buttocks but are most painful when on skin closely attached to underlying structures (e.g., on the nose, ear, or fingers)
  - (b) The initial nodule becomes a .5-2 cm pustule that discharges a core of necrotic tissue and pus
- (2) Treatment
  - (a) Incision and drainage or application of liquid soap containing either chlorhexidine gluconate with isopropyl alcohol or 2 to 3% chloroxylenol, which may be prophylactic but is not therapeutic
  - (b) A single furuncle is treated with intermittent hot compresses to allow the lesion to point and either drain spontaneously or incised and drained
  - (c) Facial furuncles should be managed closely, due to the possibility of retrograde spread of infection through cranial channels
  - (d) Patients with furuncles are usually treated with systemic antibiotics. Usually a penicillinase-resistant penicillin is

- required, such as cloxacillin 250 to 500 mg P.O. qid, or a cephalosporin, such as cephalexin in the same dosage
- (e) Refer patient to MD/PA for treatment

### **Carbuncle**

A cluster of furuncles with subcutaneous spread of staphylococcal infection, resulting in deep suppuration, often extensive local sloughing, slow healing, and a large scar

- (1) Signs and symptoms
- (a) Carbuncles occur most frequently in males and most commonly on the nape of the neck
- (b) Carbuncles develop more slowly than single furuncles and may be accompanied by fever and prostration
- (2) Treatment is the same as for clusters of furuncles (see above)
- (3) Refer patient to MD/PA for treatment

### **Bites**

1-3 million animal bites to humans occur annually in the U.S. Dog bites represent 70-90% of all bites. Cat bites represent 7-20% and have a higher incidence of infection. Human and rodent bites make up the remainder of bites.

- (1) Signs and symptoms
- (a) The extremities are involved in 75% of cases when victims handle or attempt to avoid the animal. Head and neck injuries are the next most common
- (b) Wounds should be described as to size, location and type. Include diagrams. If infected, describe adenopathy and diagram extent of cellulitis
- (c) These organisms are resistant to many antibiotics but are generally sensitive to ampicillin and penicillin
- (d) All bite injuries are potentially dangerous and can cause significant infection
- (2) Treatment
- (a) Wash with warm soapy water
- (b) Provide aggressive and meticulous wound care
- (c) Provide tetanus prophylaxis, as indicated
- (d) Systemic antibiotics for anaerobic and aerobic organisms are given. The type of antibiotic given is dependent on type of animal involved
- (e) Review rabies postexposure prophylaxis guidelines. Exposure is defined as an open bite or wound in contact with body fluids
- (f) Review for possibility of hepatitis B or C transmission in human bites and provide immunoprophylaxis if necessary
- (g) Refer all bite wounds to a MD/PA for assessment and treatment

### **Felon**

Infection of the distal fat pad of a digit. The most common site is the distal pulp, which may be involved centrally, laterally, and apically. Staph aureus is the usual bacteria involved

- (1) Signs and symptoms
  - (a) The area between pulp spaces ordinarily limit the spread of infection, resulting in an abscess, which creates pressure of adjacent tissues
  - (b) The underlying bone, joint, or flexor tendons may become infected, and intense throbbing pain and a swollen pulp are present
- (2) Treatment
  - (a) Treatment involves prompt incision and drainage
  - (b) Systemic antibiotics are generally given
  - (c) Wound should be checked in 1-3 days
  - (d) Refer patient to MD/PA for treatment

### **Identify and Manage Inflammatory Disorders**

#### **Contact Dermatitis**

Contact dermatitis can be subdivided into allergic contact dermatitis and irritant contact dermatitis

- (1) Primary irritants may damage normal skin or irritate existing dermatitis
- (2) Allergic contact dermatitis patients may become allergic to substances that they have sometimes used for years or to drugs used to treat skin diseases
- (3) Examples of agents that may cause contact dermatitis
  - (a) Medications- topical
  - (b) Plants-poison oak, poison ivy
  - (c) Chemicals used in the manufacture of shoes and clothing, metal compounds, dyes, and cosmetics
  - (d) Industrial agents
  - (e) Sensitivity to rubber and latex in gloves is a particular problem for many health professionals
  - (f) Sensitivity to latex condoms may preclude their use in some men
  - (g) Photodermatitis occurs after sunlight exposure of a patient wearing photosensitizers that exaggerates the sun's effect. Aftershave lotions, sunscreens, and topical sulfonamides are commonly responsible for photoallergic contact dermatitis
  - (h) Perfumes
- (4) Signs and Symptoms
  - (a) Transient redness to severe swelling with bullae
  - (b) Pruritus and vesiculation are common

- (c) Any skin surface exposed to an irritant or sensitizing substance
  - (d) Typically, the dermatitis is limited to the site of contact but may later spread
  - (e) Vesicles and bullae may rupture, ooze, and crust
  - (f) As inflammation subsides, scaling and some temporary thickening of the skin occur
  - (g) Continued exposure to the causative agent (e.g., irritation from or allergy to a topical drug, excoriation, and infection) may perpetuate the dermatitis
- (5) Diagnosis
- (a) Typical skin changes and a history of exposure facilitate diagnosis
  - (b) The patient's occupation, hobbies, household duties, vacations, clothing, topical drug use, cosmetics, and spouse's activities must be considered
  - (c) Knowing the characteristics of irritants or topical allergens and the typical distribution of lesions is helpful
  - (d) The site of the initial lesion is often an important clue
- (6) Treatment: Unless the causative agent is identified and removed, treatment will be ineffective. Patients with photodermatitis should also avoid the photosensitizing chemical or exposure to light
- (a) In acute dermatitis, gauze or thin cloths dipped in water and applied to the lesions (30 min 4 to 6 times/day) are soothing and cooling
  - (b) An oral corticosteroid (e.g., prednisone 60 mg/day) may be given (if not contraindicated) for 7 to 14 days in extensive cases, or even in limited cases when facial inflammation is present. The prednisone dose can be decreased by 10 to 20 mg q 3 to 4 days
  - (c) Topical corticosteroids are not helpful in the blistering phase, but once the dermatitis is less acute, a topical corticosteroid cream or ointment can be rubbed in gently three times daily
  - (d) Antihistamines are ineffective in suppressing allergic contact dermatitis but help the itch

### Pruritus (Itching)

A sensation that the patient instinctively attempts to relieve by scratching or rubbing

- (1) Etiology: Pruritus is a symptom and not a disease. It may accompany a primary skin disease or a systemic disease. Skin diseases causing severe pruritus and lesions include scabies, pediculosis, insect bites, urticaria, atopic dermatitis, and contact dermatitis
- (2) Systemic conditions that cause generalized pruritus, usually without skin lesions, include
  - (a) Liver disease
  - (b) Kidney disease
  - (c) Uremia-excessive amounts of urea and other waste products in the blood
  - (d) Pregnancy
  - (e) Medications
- (3) Signs and symptoms:
  - (a) Persistent scratching may produce redness, linear urticarial papules, and excoriation of preexisting papules, fissures, and elongated crusts along scratch lines, which may obscure the underlying disease
  - (b) Lichenification and pigmentation may also result from prolonged scratching and rubbing. Occasionally, patients who complain of severe generalized pruritus have few signs of scratching or rubbing the skin
- (4) Treatment: The cause of generalized pruritus should be sought and corrected. If no skin disease is apparent, a systemic disorder or drug-related cause should be sought
  - (a) If feasible, all drugs should be stopped
  - (b) Clothing that is irritating (e.g., woolens) or tight should be avoided
  - (c) Bathing should be brief, as it may aggravate generalized pruritus, especially if the patient has dry skin; lukewarm (not hot) water should be used
  - (d) Emollients (e.g., white petrolatum or other oil-based products) are good moisturizers to apply after bathing while the skin is still wet (excess water should be blotted)
  - (e) Topical corticosteroids seldom alleviate generalized pruritus (without dermatitis) but may be useful if used with lubricants in elderly patients with dry skin
  - (f) If a drug has been ruled out as the cause of pruritus, hydroxyzine (10 to 50 mg P.O. q 4 h prn) may be prescribed. If antihistamines are helpful, their sedative effect may be the reason

**Bulla (blister)**

- (1) Definition - a large blister or skin vesicle filled with fluid below the epidermis
- (2) Causes
  - (a) Thermal or chemical burns (2nd degree)
  - (b) Friction or pressure (e.g., poorly fitted shoes, rug burn)
  - (c) Ruptured blood vessels due to trauma
  - (d) Herpes simplex (fever blister)
- (3) Signs and symptoms
  - (a) Large elevated fluid filled lesion greater than 1 cm in diameter
  - (b) Discoloration at borders of blister, may be red or pale pink
  - (c) Pain and tenderness with palpation or pressure. Mostly occurs on feet
- (4) Treatment
  - (a) Avoid aggravating area by removing cause as soon as possible (e.g., tight shoes/boots, wet socks)
  - (b) "DO NOT" lance blister unless unable to remove cause (e.g., blister located on foot during a road march)
  - (c) If cause can not be removed, lance bottom of blister with a sterile needle or scalpel, and allow to drain
  - (d) Keep area covered and clean. Build up dressing around blister to prevent friction

**Identify and Manage Fungal Infections of the Skin**

**Fungal infections are common on the feet and the body**

- (1) Fungal infections may be pruritic or asymptomatic. Occasionally there is tenderness and inflammation
- (2) Symptoms- depend on the location
  - (a) Scalp (tinea capitis)- alopecia, scaling, swelling and occasional purulent discharge
  - (b) Feet (tinea pedis)- scaling, thickened soles, occasional blisters
  - (c) Skin (tinea corporis)- inflammation and scaling
- (3) Skin (Tinea Corporis)
  - (a) Erythematous plaque with central clearing and sharp margins
  - (b) The organism may persist indefinitely, causing intermittent remissions and exacerbations of a gradually extending lesion with a scaling, slightly raised border
  - (c) Intense inflammation with or without pustules may be present
  - (d) Treatment- Most skin infections respond very well to topical antifungal preparations, such micatin, tinactin or lamisil. Resistant cases or those with widespread involvement require systemic antifungal therapy.
- (4) Tinea pedis (Athlete's Foot)



- (a) Infections typically begin in the 3rd and 4th interdigital spaces and later involve the plantar surface of the arch
  - (b) Toe web lesions often are macerated and have scaling borders; they may be vesicular
  - (c) Acute flare-ups, with many vesicles and bullae, are common during warm weather
  - (d) Tinea pedis may be complicated by secondary bacterial infection, cellulitis, or lymphangitis, which may recur
  - (e) Treatment- Interdigital infections can be successfully treated with topical agents. Good foot hygiene is essential. Interdigital spaces must be dried after bathing, macerated skin gently debrided, and a bland, drying antifungal powder (eg, miconazole) applied
  - (f) Cure with topical treatment is difficult, but control may be obtained with long-term therapy. Recurrence is common after therapy is discontinued
- (5) Tinea capitis (Scalp): Tinea capitis mainly affects children. It is contagious and may become epidemic
- (a) Inflammation that is low-grade and persistent. Alopecia may occur with characteristic black dots on the scalp result from broken hairs
  - (b) Treatment- topical treatment is not advised. Oral antifungal therapy is indicated
- (6) Tinea cruris (Jock Itch)
- (a) Typically, a ringed lesion extends from the crural fold over the adjacent upper inner thigh. Both sides may be affected
  - (b) Scratch dermatitis and lichenification often occur. Lesions may be complicated by maceration, miliaria, secondary bacterial or candidal infection, and reactions to treatment
  - (c) Recurrence is common because fungi may repeatedly infect susceptible persons. Flare-ups occur more often during summer, due to heat and humidity of the skin area
  - (d) Tight clothing or obesity tends to favor growth of the organisms
  - (e) Treatment- Topical therapy with a cream or lotion, as in tinea corporis, is often effective. Instruct the patient to keep the area as clean and dry as possible,

### ***Identify and Manage Other Skin Disorders***

#### **Scabies**

The arthropod itch mite causes the dermatitis scabies in humans. Transmission occurs between people via skin-to-skin contact or through bed linens and clothing

- (1) Signs and Symptoms
  - (a) Intense itching, especially at night, with vesicles, papules and linear burrows which contain the mites and eggs
  - (b) Lesions prominent around finger webs, elbows, buttocks and genital area

- (c) Complications are generally due to infection of lesions that are broken from scratching
- (2) Treatment
  - (a) Treatment should include the patient, sexual partners, household members and caregivers
  - (b) Overnight applications of topical medications have proven to be the most effective
  - (c) Bag patient's linen separately. Instruct the patient to wash bedding in HOT water

### Lice

- (1) Three types:
  - (a) Pediculosis Pubis
    - (i) Infestation in the pubic region
    - (ii) Spread by intimate contact, often sexual
    - (iii) The lice survive for about one day off the host.
  - (b) Pediculosis capitis
    - (i) Infestation on the scalp
    - (ii) Spread by casual contact and by fomites such as shared combs or hats
    - (iii) Survive only a few days off the host.
  - (c) Pediculosis corporis
    - (i) Usually found on clothing, particularly in the seams around warm areas
    - (ii) Come onto the skin only to feed
- (2) Signs and Symptoms
  - (a) Pediculosis Pubis
    - (i) Complains of perineal pruritus
    - (ii) Examination shows adult lice attached to the skin and nits attached to hair shafts
    - (iii) Blue macules around the thighs and pubic area may occur at sites where the organism is feeding
  - (b) Pediculosis capitis
    - (i) Complains of itching of the scalp or eyelashes
    - (ii) Examination shows adult lice in hair
    - (iii) Nits at the base of the hair shaft, macules, wheals, and excoriations are present
  - (c) Pediculosis corporis
    - (i) Complains of diffuse pruritus (especially if there is evidence of generally poor hygiene)
    - (ii) Examination reveals erythematous macules, wheals, and excoriations, often with superinfection
    - (iii) Lice are found in clothing rather than on body
- (3) Treatment of Pediculosis pubis, capitis, corporis
  - (a) Overnight applications of topical medications have proven to be the most effective
  - (b) Bag patient's linen separately. Instruct the patient to wash bedding in HOT water

- (c) Hats, combs, and brushes should be thoroughly cleaned before being reused
- (d) Sexual contacts of patients should be also be treated and close contact of patient with pediculosis capitis and corporis should be examined for lice.
- (e) Since both scabies and pediculosis may be sexually transmitted, examination for other sexually transmitted diseases should be performed and a serologic test for syphilis (VDRL or other ) obtain

## **TERMINAL LEARNING OBJECTIVE**

Given a standard fully stocked M5 Bag or Combat Medic Vest System, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms. You encounter a casualty complaining of infectious disease and/or immunological symptoms. No other injury(ies) are present.

### **Review Concepts Associated with Infectious Diseases**

#### **Public health principles relative to infectious diseases**

- (1) All humans are susceptible to infectious disease
- (2) Individuals display varying susceptibilities to infection
- (3) When dealing with infectious diseases, the soldier medic must consider the needs of the casualty, potential consequence on public health and his own health protection
- (4) The soldier medic should think of the consequences of the patients' contact with family members, roommates and friends

#### **Infectious agents**

- (1) Bacteria- unicellular microorganisms
- (2) Viruses- submicroscopic organism. Able to replicate only in a living cell
- (3) Fungi- spore bearing plants
- (4) Rickettsia- microorganisms, which combine qualities of bacteria and viruses
- (5) Helminths (worms)- various invertebrates, having round or flattened bodies

#### **Terminology of the immune system**

- (1) Antibodies- a protein produced by lymphocytes in response to infectious agents
- (2) Antigen- A substance which causes the formation of an antibody
- (3) Epitope- a specific site where an antibody binds. May be numerous epitopes on one antigen
- (4) Leukocytes- White blood cells
  - (a) Five types:
    - (i) Lymphocytes
      - \* T cells - Divide rapidly when exposed to antigen. May assist in destroying foreign protein
      - \* B cells - circulate in immature form, activated when exposed to antigen
    - (ii) Monocytes
      - \* Ingest dead or damaged cells via phagocytosis (absorption of foreign bodies in the bloodstream)
      - \* Provide immunological defenses against infectious organisms
    - (iii) Neutrophils

- (iv) \* Basophils
  - \* Essential for phagocytosis
  - \* Increased number during healing phase and inflammation
  - \* Immediate immune response to external antigens
- (v) \* Eosinophils
  - \* Increase numbers in certain diseases, especially infections by helminths and allergies

#### Host defense mechanisms

- (1) Nonspecific immune system defenses
  - (a) Skin
    - (i) Effectively bars invading microorganisms
    - (ii) Some exceptions occur, as with human papillomavirus (causative agent of warts) which can invade normal skin
    - (iii) Normal dermal flora - alteration of this flora can lead to overgrowth of inherently pathogenic microorganisms
  - (b) Respiratory system
    - (i) Inhaled microorganisms must penetrate the filter system of the upper airways and tracheobronchial tree
    - (ii) Coughing also helps remove organisms
    - (iii) Smoking greatly impairs effectiveness
    - (iv) These defense mechanisms can be overcome by large numbers of organisms or by compromised effectiveness resulting from air pollutants
  - (c) Inflammatory response
    - (i) Directs immune system components to injury or infection sites and is manifested by increased blood supply and vascular permeability
    - (ii) Microorganisms are engulfed by phagocytic cells in an attempt to contain the infection
- (2) Specific immune system defenses
  - (a) Humoral immunity
    - (i) Component of the immune system involving antibodies
    - (ii) Recognizes antigens associated with microorganisms or foreign substances
    - (iii) Recognition is coupled with ability to initiate appropriate actions against these microorganisms or foreign substances
  - (b) Cell-mediated immunity
    - (i) Phagocytic and/or cytotoxic cells play major role
    - (ii) Antibody plays minor role

- (iii) Macrophages and neutrophils important in combating bacteria
- (iv) T cells essential to elimination of virus-infected cells

**General Assessment of Suspected Infectious or Communicable Disease**

**Primary assessment**

- (1) Ensure open airway
- (2) Assess breathing
- (3) Assess circulation

**Secondary assessment (specific to infectious disease)**

- (1) History of present illness
- (2) Past medical history
  - (a) Chronic infections, inflammation
  - (b) Medications
  - (c) Medical and surgical history
- (3) Detailed history and physical
  - (a) Vital signs
  - (b) Assess skin
    - (i) Temperature
    - (ii) Turgor (hydration)
    - (iii) Color (jaundice)
    - (iv) Abnormal lesions
  - (c) Assess Head, Ears, Eyes, Neck, and Throat (HEENT)
  - (d) Assess neck
    - (i) Lymphadenopathy - localized or generalized enlargement of lymph nodes or lymph vessels
    - (ii) Rigidity
  - (e) Assess for abnormal breath sounds
  - (f) Assess abdomen
    - (i) Tenderness
    - (ii) Rebound
    - (iii) Guarding or organomegaly
  - (g) Assess extremities for edema, pain and joint range of motion (ROM)

**Assess and Treat Eye, Ear, Nose, Throat, and Respiratory Complaints**

**Conjunctivitis (pink eye)**

- (1) Infection of the membrane lining the eyelids (conjunctiva)
- (2) Signs and Symptoms- may be unilateral or bilateral
  - (a) Pruritus
  - (b) Burning
  - (c) Itching
  - (d) Swelling
  - (e) Excessive purulent discharge or tearing
  - (f) Redness

- (3) Provide medical care
  - (a) Perform visual acuity before any treatment is initiated
  - (b) Ensure eye is not injured and no foreign body is present
  - (c) Administer ophthalmic ointments or solutions for conjunctivitis as ordered by MD/PA
  - (d) Use universal precautions (gloves), conjunctivitis is very contagious
- Pharyngitis (sore throat)**
- (1) The majority of sore throat complaints are viral in origin, not bacterial
- (2) Most common bacteria causing pharyngitis is group A Beta hemolytic streptococcus
- (3) Signs and symptoms
  - (a) Often difficult to clinically differentiate between viral and bacterial infections
  - (b) Patients with a bacterial (strep) infection may present with:
    - (i) Sudden onset of sore throat
    - (ii) Painful swallowing
    - (iii) Chills and fever
    - (iv) Headache, nausea, vomiting and abdominal pain are common associated symptoms
  - (c) Physical examination of patients with strep throat reveals
    - (i) Foul smelling breath
    - (ii) Beefy red throat
    - (iii) Tonsillar exudate
    - (iv) Enlarged, tender anterior cervical lymph nodes. There is no posterior cervical adenopathy.
    - (v) Patient may have petechiae on the palate and strawberry tongue
  - (d) Patient with a viral pharyngitis usually present with a more vesicular and petechial pattern on the soft palate and tonsils and no exudate
  - (e) Throat culture remains the most effective method for diagnosis
- (4) Provide medical care
  - (a) Symptomatic treatment
    - (i) Gargling with warm salt water
    - (ii) Drinking warm liquids
    - (iii) Rest
    - (iv) Consider IV hydration in patients who are unable to tolerate oral fluids or who become dehydrated
  - (b) Antibiotics
    - (i) Drug of choice for strep throat is penicillin. Ampicillin or amoxicillin may also be used.
    - (ii) May also consider cephalosporin
    - (iii) Erythromycin is drug of choice for patients allergic to penicillin
    - (iv) Oral medications usually administered for 10 days even though pain from sore throat may resolve in 24-48 hours

- (v) Refer to MD/PA for appropriate therapy
- (c) Untreated strep throat (group A B – hemolytic streptococcus) is associated with significant sequela in the form of acute rheumatic fever or acute glomerulonephritis. Because of this, early diagnosis and treatment of strep throat is essential.
- (d) Prevent spread
  - (i) Handwash
  - (ii) Avoid using same utensils or drinking from same container
  - (iii) Avoid close contact
- (e) Infectious mononucleosis
  - (i) Acute viral infection is primarily caused by an Epstein-Barr virus (EBV). Infrequent causes are Cytomegalovirus (CMV) and Human Immunodeficiency Virus (HIV)
  - (ii) Humans are the sole source, with transmission by close contact. Incubation period is 3-7 weeks.
  - (iii) Assessment findings
    - \* High fever
    - \* Swollen lymph glands
    - \* Sore throat
    - \* Fatigue
    - \* Persistent headache
    - \* Acute phase lasts 1-3 weeks, with complete recovery expected in 6-8 weeks
    - \* Most serious complication is splenic rupture due to an enlarged spleen, combined with physical activity. Limited activity during the acute phase is required. All soldiers must be assessed by an MD/PA for suspected mono cases.
  - (iv) Provide care
    - \* Uncomplicated acute infectious mononucleosis usually only requires supportive therapy
    - \* Consider Tylenol for fever and pain
    - \* Warm salt water gargles for sore throat
    - \* Patient should get ample bed rest. Isolation is unnecessary because EBV shedding continues after the acute illness
    - \* Recovery occurs in a few weeks; however, some people take months to regain former level of energy



### Influenza

- (1) Viral infection of the respiratory tract
- (2) Flu vaccine is available annually. Influenza is self-limited in healthy individuals, but its potentially severe consequences must be stressed to elderly or chronically ill patients to ensure their annual vaccination.
- (3) Assessment findings
  - (a) Fever- may be high (up to 103 degrees)- rapid onset and may last 3-5 days
  - (b) Cough- usually nonproductive. If a secondary bacterial infection occurs, cough turns productive with purulent sputum
  - (c) Headache
  - (d) Muscle aches- may be tender to palpation
  - (e) Shortness of breath
  - (f) Chills
  - (g) Sweating
  - (h) Fatigue
  - (i) Nausea and vomiting
  - (j) Joint stiffness and aches
  - (k) Nausea, vomiting
- (4) Provide medical care
  - (a) Because influenza is a viral infection, antibiotics are not helpful
  - (b) Bed rest
  - (c) Provide analgesics for muscle aches
  - (d) Provide oral or intravenous fluids
  - (e) Symptoms may last 7 - 10 days
  - (f) Notify MD/PA if:
    - (i) Symptoms increase
    - (ii) Fever is present
    - (iii) Unable to keep food or fluids down

### Cough

- (1) Sudden, forceful release of air from the lungs
  - (a) Helps clear material
  - (b) May produce and expel mucus and/or pus - productive cough
  - (c) Minor irritations in throat can start cough reflex though normal mucus is only material expelled - dry cough
- (2) Common causes include:
  - (a) Smoking
  - (b) Common cold or flu
  - (c) Allergies
  - (d) Bacterial infection
  - (e) Viral infection
  - (f) Asthma
  - (g) Emphysema
- (3) Assessment Findings
  - (a) Shortness of breath requires immediate evaluation.

- (b) Productive or nonproductive cough - Productive may be rusty/blood-streaked, yellow-green or yellow sputum
- (c) Elevated temperature
- (d) Chest may be clear to auscultation or have abnormal breath sounds (wheezing, rhonchi or crackles)
- (4) Provide medical care
  - (a) Increase air humidity, if available
  - (b) Inform patient to drink extra fluids
  - (c) Consider an expectorant to help liquefy secretions
  - (d) Consider a decongestant if cough is accompanied by runny nose
  - (e) Consider antihistamines if caused by allergy or sinus infection
  - (f) Dry tickling coughs can be relieved by lozenges
- (5) Notify MD/PA if:
  - (a) Violent cough begins suddenly or high-pitched sound (stridor)
  - (b) Produce blood
  - (c) Shortness of breath and/or difficulty breathing
  - (d) Abnormal breath sounds are heard on auscultation
  - (e) Fever or abdominal swelling
  - (f) Unintentional weight loss
  - (g) Thick, foul-smelling, rusty, or greenish mucous
  - (h) Lasts more than 10 days

**Pneumonia**

- (1) Inflammation of lungs caused by an infection
- (2) Prevention
  - (a) Vaccination (flu, pneumovax) may be helpful in preventing some types of pneumonia
  - (b) Coughing and deep breathing

**Bronchitis**

- (1) Inflammation of the bronchi
- (2) Prevention
  - (a) Early recognition
  - (b) Treat small airway disease
  - (c) Smoking cessation

**Viral Upper Respiratory Infection (Common Cold)**

- (1) Contagious viral infection of the upper respiratory tract. Transmission may occur through air droplets (sneezing) or lack of handwashing
- (2) Assessment Findings (usually minimal)
  - (a) Runny nose
  - (b) Nasal congestion
  - (c) Sneezing
  - (d) Sore throat
  - (e) Cough
  - (f) Muscle aches
  - (g) Headache

- (h) Low grade fever (100 F or lower)
- (3) Provide medical care
  - (a) Consider antihistamine and/or decongestant for nasal congestion
  - (b) Consider Tylenol for minor aches and pains
  - (c) Patient should get able bed rest
  - (d) Instruct patient to drink plenty of fluids
  - (e) Patient should return to MTF if:
    - (i) Develop temperature greater than 101F
    - (ii) Develop a productive cough
    - (iii) Symptoms do not begin to improve within the next 2-3 days

**Assess and Treat Gastrointestinal (GI) Complaints**

**Nausea/Vomiting**

- (1) Nausea is the sensation leading to the urge to vomit
- (2) Vomit is to force the contents of the stomach up through the esophagus and out of the mouth
- (3) A common cause is a viral infection. Assessment findings include:
  - (a) Presence of absence of abdominal pain
  - (b) Description of emesis
  - (c) Fever
- (4) Provide care
  - (a) Instruct patient to drink clear fluids for 24 hours. Solids should be increased as tolerated.
  - (b) Patient should get bed rest
  - (c) Instruct patient to return to MTF if:
    - (i) Blood is in vomitus
    - (ii) Increasing abdominal pain
    - (iii) Nausea/vomiting persists for greater than 24 hours

**Diarrhea**

- (1) Frequent passage of unformed, watery stool
- (2) Infectious diarrheal disease can be grouped:
  - (a) Viruses
  - (b) Bacteria
  - (c) Parasites
  - (d) Funguses
- (3) Assessment findings include:
  - (a) Abdominal cramps
  - (b) Fever
- (4) Provide care
  - (a) Observe good hygiene. Wash hands frequently.
  - (b) Consider Imodium (only if non bloody) or Pepto-Bismol
    - (i) May be given to the patient for the symptomatic control of diarrhea
    - (ii) Best treatment is NOT to interfere with the mechanical cleansing of the GI tract

- (c) If diarrhea is not controlled in 24-48 hours with normal medications, refer patient to MD/PA for assessment

**Gastroenteritis**

- (1) Inflammation of stomach and intestines due to bacterial or viral infection
- (2) Modes of transmission
  - (a) Fecal-oral
  - (b) Ingestion of infected food or non-potable water
- (3) Susceptibility and resistance
  - (a) Travelers into endemic areas are more susceptible
  - (b) Populations in disaster areas, where water supplies are contaminated, are susceptible
  - (c) Native populations in endemic areas are generally resistant
- (4) Assessment findings include:
  - (a) Nausea/Vomiting
  - (b) Diarrhea
  - (c) Fever
  - (d) Abdominal pain and cramping
  - (e) Diarrhea
  - (f) Heartburn
- (5) Provide care
  - (a) Antibiotic therapy is usually not indicated
  - (b) Consider antidiarrheal medications, though not generally given because they may prolong infectious process
  - (c) Clear liquid diet

**Assess and Treat a Fever, Headache, and Sinus Symptoms**

**Fever-**

Fever is a common presenting symptom, accounting from 2-6 percent of adults presenting to hospital emergency rooms and clinics.

- (1) Fever can be due to:
  - (a) Infection: all causes, whether bacterial, viral or parasitic
  - (b) Trauma
  - (c) Immunologic: serum sickness or acute inflammatory arthritis
  - (d) Drug induced
  - (e) Vascular disorders: acute myocardial infarction, pulmonary emboli
- (2) Acute bacterial infection requires a timely diagnosis and treatment. The initial approach to evaluating a patient with an acute fever is detecting a treatable infection or excluding a bacterial infection with reasonable certainty.
- (3) Fever above 100 F must be evaluated by an MD/PA
- (4) Provide care
  - (a) Administer Tylenol or Motrin. The use of aspirin should not be used due to bleeding problems

- (b) If fever is uncontrolled, seek methods of cooling patient. Such as cooling mats, tepid baths or showers.

### Headache

- (1) Meningitis- an infection of the meninges (the membranes surrounding the brain)
  - (a) Causes:
    - (i) Bacterial
    - (ii) Viral
    - (iii) Fungal
  - (c) Signs and Symptoms
    - (i) Headache, sudden onset, severe, usually occipital
    - (ii) Fever
    - (iii) Chills
    - (iv) Photophobia
    - (v) Neck stiffness or nuchal rigidity (more pronounced on flexion)
    - (vi) Petechial rash - Bacterial
    - (vii) Altered mental status
    - (viii) Nausea and vomiting
  - (d) Provide medical care
    - (i) Protective measures should include BSI with surgical masks applied to casualties displaying suggestive signs/ symptoms
    - (ii) **Meningitis is a medical emergency. Delay in treatment will result in death.** Notify MD/PA immediately and evacuate
    - (iii) Initiate IV
    - (iv) Perform serial neurological examinations

### Sinusitis

- (1) Disorder involving infection and/or inflammation of one or more of the paranasal sinuses. The maxillary sinuses are the most frequently affected. Factors predisposing to sinusitis are upper respiratory infection, smoking, allergies and nasal polyps.
- (2) Assessment findings include:
  - (a) Headache
  - (b) Purulent nasal discharge
  - (c) Cough
  - (d) Pain in the sinus area with palpation or percussion
  - (e) Facial pain
  - (f) Pain may also be referred to the teeth. Patients may complain of a "toothache".
- (3) Provide medical care
  - (a) Administer analgesics to relieve pain
  - (b) Administer saline or decongestant nasal sprays to increase drainage
  - (c) Consider an expectorant/mucolytic to thin secretions and promote drainage

- (d) Antibiotic therapy is indicated for 10-21 days. Antibiotic choice is based on duration of symptoms and the individual patient
- (e) Refer patient to MD/PA for suspected sinus infections

### **Assess and Treat Hepatitis**

#### **Viral Hepatitis-**

Management of viral hepatitis has been through major changes, therefore knowledge of the various types is important. At least 7 major viruses have been identified and cause the majority of disease

- (1) **Hepatitis A-** inflammation of liver caused by hepatitis A virus
  - (a) Seen worldwide and is a food and water-borne disease
  - (b) Spread by fecal-oral contact
- (2) Signs and symptoms
  - (a) Symptoms are similar to flu
    - (i) Fever
    - (ii) Weakness
  - (b) Jaundice of skin and eyes - liver is not able to filter bilirubin from blood
  - (c) Darkening of urine
  - (d) Clay colored stools
  - (e) Nausea and vomiting
- (3) Provide care
  - (a) Treatment is primarily supportive
  - (b) Rest should be recommended during acute phases
  - (c) Patient should avoid alcohol and substances toxic to liver
  - (d) Full recovery usually within 1 month
  - (e) Patient education should be given advising avoidance of unbottled drinking water, ice, shellfish or unpeeled fruits and vegetables in endemic areas
  - (f) Hepatitis A vaccine is available prior to deployment to endemic areas
- (4) **Hepatitis B and Hepatitis C-** inflammation of the liver caused by a Hepatitis B virus or Hepatitis C virus
  - (a) Transmission is parenteral, with the virus found in body fluids such as blood, semen and saliva
  - (b) Sexual transmission is common
  - (c) IV drug usage is also an important mode for transmission
- (5) Assessment findings
  - (a) Jaundice
  - (b) Fatigue
  - (c) Nausea and vomiting
  - (d) Low grade fever
  - (e) Pale or clay color
  - (f) Abnormal urine color/dark urine
  - (g) Abdominal pain and enlarged liver
  - (h) In Hepatitis C, many patients are asymptomatic
- (6) Provide care

- (a) Treatment is primarily supportive. Interferon is used with some success in Hepatitis B and C patients.
  - (b) Bedrest and occasionally hospitalization during the acute phase is necessary
  - (c) Patient should avoid alcohol and substances toxic to liver
  - (d) Patient should be informed of preventative measures
    - (i) Hepatitis B vaccination series
    - (ii) Condoms if sexually active
    - (iii) Test for HIV
- (7) **Hepatitis D**
- (a) Hepatitis D occurs only in association with Hepatitis B infection. Mode of transmission is similar to Hepatitis B
  - (b) May increase severity of disease associated with Hepatitis B
  - (c) Treatment is same as for hepatitis B
- (8) **Hepatitis E**
- (a) Hepatitis E is a food and water-borne disease
  - (b) Associated with epidemics where there is fecally contaminated water
  - (c) Treatment and travel precautions are identical to Hepatitis A
- (9) **Hepatitis G-** has recently been identified in patients with Hepatitis that was not Hepatitis C
- (a) Liver disease has not been proven
  - (b) Signs and symptoms have not yet been characterized

**Assess for Human Immunodeficiency Virus (HIV)**

**A viral infection-**

Caused by the human immunodeficiency virus (HIV) that gradually destroys the immune system. Although the virus has been found in all body fluids, only blood, semen and vaginal secretions have been implicated in transmission. There are three known routes of transmission:

- (1) Sexual transmission (anal, oral or vaginal)
- (2) Blood or blood products (transfusions, infected needles)
- (3) Perinatal transmission (in utero, at delivery or through breastfeeding)

**History of HIV**

- (1) Initial case definition was established by CDC in 1982
- (2) In 1987 and 1993, case definitions were expanded to include additional illnesses

Body systems affected and potential secondary complications - generally related to opportunistic infections that arise as immune system compromise develops

- (1) Nervous system - toxoplasmosis of CNS
- (2) Immune system - major site of compromise
- (3) Respiratory system - pneumocystis carinii pneumonia
- (4) Integumentary system - Kaposi's sarcoma

**Health care workers -**

- (1) At risk increased when:
  - (a) The exposure involves a large quantity of blood
  - (b) Needle or instrument stick needle size, type (hollow bore versus suture), and depth of penetration
  - (c) The exposure to a patient with a terminal HIV related illness, possibly reflecting a higher viral load in the late course of AIDS
  - (d) Universal precautions not adhered to
- (2) Risk needs to be understood in terms of how the exposure occurred, and what factors were involved
- (3) Potential may appear to be high, but the probability may actually be quite low

**Assessment findings- Asymptomatic HIV Infection**

- (1) Asymptomatic HIV patients must have had no previous signs or symptoms attributable to HIV infection
- (2) History may be suggestive of an acute mononucleosis or flulike syndrome in the past
- (3) Physical examination of asymptomatic HIV patient is completely normal
- (4) Diagnosis is made with laboratory evidence only

**Assessment Findings-**

Early Symptomatic HIV Infection

- (1) With disease progression, CD4 lymphocyte counts decrease. There is an increased risk of opportunistic infections
- (2) Signs and symptoms associated with early HIV disease are frequently nonspecific
  - (a) Fever
  - (b) Sore throat
  - (c) Fatigue
  - (d) Myalgia
  - (e) Weight loss
  - (f) Night sweats
  - (g) Lymphadenopathy
  - (h) Chronic cough
  - (i) Shortness of breath
  - (j) Oral lesions, ulcers
  - (k) Chronic diarrhea
  - (l) Skin rashes
- (3) Diagnosis is made with laboratory evidence and presence of one or more opportunistic infections:
  - (a) Oral candidiasis
  - (b) Generalized wasting
  - (c) Generalized lymphadenopathy
  - (d) Hepatosplenomegaly
  - (e) Severe herpes zoster in a previously healthy person
  - (f) Pneumocystis carinii pneumonia

**Assessment Findings-**

Late Symptomatic HIV Infection



- (1) Progressive destruction of CD4 cells by the HIV virus places the patient at risk for opportunistic infections, routine infections and malignancies
- (2) Symptoms depend on reactivation of previous illness or exposure to new infections. Commonly seen are:
  - (a) Chronic headaches
  - (b) Seizures
  - (c) Chronic diarrhea
  - (d) Weight loss leading to wasting
  - (e) Chronic fever
  - (f) Visual changes leading to blindness

**Provide care**

- (1) Treatment of HIV is complex and beyond the scope of the handout
- (2) Isolation is unnecessary, ineffective and unjustified
- (3) Observe BSI when treating an HIV patient
- (4) Psychosocial evaluation of the patient is indicated because of the high incidence of family dysfunction, depression and suicide associated with HIV infection
- (5) Sexual partner notification by Preventive Medicine is essential to prevent transmission
- (6) Consistent use of latex condoms, preferably with nonoxynol-9, a spermicide is recommended to prevent sexual transmission of HIV. Petroleum based lubricants should be avoided because they increase the risk of condom rupture

**Assess and Treat for Lyme Disease**

**An acute inflammatory disease-**

Caused by the spirochete *Borrelia burgdorferi* Transmitted by the bite of a deer tick.

**Assessment findings-**

- (1) An early localized stage with a painless skin lesion at the site of the bite, called erythema migrans (EM), and a flu-like syndrome with malaise, myalgia
- (2) EM starts off as a red, flat, round rash which spreads out; the outer border remains bright red, with the center becoming clear, blue, or even necrose and turn black
- (3) Incubation period until EM - 3 to 32 days post tick exposure
- (4) Fever and headache
- (5) Inflammation in the knees and other large joints in systemic infection

**Patient management and control measures**

- (1) The 91W Medic who works, or treats/ transports casualties in a wilderness environment, should be vigilant to the presence of ticks on themselves and their casualties
- (2) There is no evidence of natural transmission from person-to-person
- (3) Tetracycline is the drug of choice given 500mg four times a day for 10-30 days

- (4) Consider anti-inflammatory medications to relieve joint stiffness

**Identify Viral Diseases of Childhood**

**Chickenpox**

- (1) A highly contagious, usually mild childhood disease caused by the Herpes varicella-zoster virus.
- (2) Assessment findings
- (a) Begins with:
    - (i) Mild respiratory symptoms
    - (ii) Malaise
    - (iii) Low-grade fever
  - (b) Rash begins as small red spots that become raised blisters on a red base. These fluid-filled vesicles eventually collapse and dry into scabs
  - (c) Intense itching
- (3) Provide care
- (a) Do NOT give aspirin due to association with Varicella and Reye's syndrome.
  - (b) Isolation of patient from medical offices, emergency departments, and public places until all lesions are crusted and dry
  - (c) Consider antiviral drugs exist that shortens the duration of symptoms and pain in the older patient
  - (d) Soldier medics who have not had chickenpox should inquire with their chain of command about receiving the chickenpox vaccine
  - (e) VZIG (Varicella Zoster immune globulin) is recommended for pregnant women with a substantial exposure (household contact, close indoor contact > 1 hour, or prolonged direct face-to-face contact with infected person) to chickenpox with no history of previous exposure to chickenpox

**Mumps**

- (1) An acute, contagious viral disease that causes painful enlargement of the salivary or parotid glands
- (2) Assessment findings
- (a) Fever
  - (b) Swelling
  - (c) Tenderness of salivary glands, especially parotid
  - (d) Sore throat
- (3) Provide care
- (a) There is no specific treatment for mumps. Measles, Mumps, Rubella (MMR) immunization should be considered.
  - (b) Symptoms may be relieved by:
    - (i) Ice or heat to affected neck area
    - (ii) Acetaminophen for pain relief
    - (iii) Warm salt water gargles

- (iv) Soft foods
- (v) Extra fluids

**Rubella (German Measles)**

- (1) A contagious viral infection with mild symptoms associated with a rash
- (2) Assessment findings
  - (a) A rash that spreads from forehead to face to torso to extremities, and lasts 3 days,
  - (b) Serious complications, such as encephalitis, which may occur in measles, do not occur in Rubella
  - (c) Younger females sometimes develop a self-limiting arthritis
  - (d) Cloudy cornea
  - (e) Low grade fever
  - (f) Inflammation of the eyes
- (3) Provide medical care
  - (a) Consider MMR immunization
  - (b) There is no treatment- supportive care primarily
  - (c) Acetaminophen can be given to reduce fever

**Measles (rubeola, red measles)**

- (1) Highly contagious viral illness
- (2) Assessment findings
  - (a) Conjunctivitis
  - (b) Swelling of the eyelids
  - (c) Photophobia
  - (d) High fevers to 105 degrees
  - (e) Hacking cough
  - (f) Malaise
  - (g) Rash
- (3) Provide care
  - (a) Immunization
    - (i) Effective immunization should be instituted for every person, and is available for combination with other vaccines and/ or toxoids (MMR)
    - (ii) Immunization in children is believed to confer 99% immunogenicity
  - (b) There is no specific treatment. Symptomatic care:
    - (i) Bed rest
    - (ii) Acetaminophen
    - (iii) Humidified air

**Pertussis (Whooping cough)**

- (1) A highly contagious bacterial disease that affects the respiratory system and produces spasms of coughing that usually end in a high-pitched crowing inspiration (whooping sound)
- (2) Assessment findings

- (a) Cough
- (b) Crowing or high-pitched inspiratory whoop
- (c) Expulsion of clear mucous
- (d) Vomiting
- (3) Provide care
  - (a) Erythromycin is given 500mg four times a day for 10 days
  - (b) Consider oxygen with high humidity
  - (c) Intravenous fluids may be indicated if coughing is severe enough to prevent adequate oral fluid intake

### **Reporting an Exposure to an Infectious/ Communicable Disease**

#### **What constitutes an exposure?**

The following should be considered an exposure incident:

- (1) Eye
- (2) Mouth
- (3) Other mucous membranes
- (4) Non-intact skin
- (5) Parenteral contact with blood
- (6) Blood products
- (7) Other potentially infectious materials

#### **Why it is important to report?**

- (1) Permits immediate medical follow up, permitting identification of infection and immediate intervention
- (2) Enables the Designated Officer (DO) to evaluate the circumstances surrounding the incident and implement engineering or procedural changes to avoid a future exposure
- (3) Facilitates follow up testing of the source individual if permission for testing can be obtained
  - (a) Under provisions of the Ryan White Act, the exposed employee has the right to request the infection status of the source casualty from the casualty's health care provider, but neither the agency nor the employee can force testing of the source individual
  - (b) Employers must, and should as part of an effective Exposure Control Plan, tell the employee what to do if an exposure incident occurs

#### **Preventing disease transmission**

- (1) Notify supervisor for proper disposition
  - (a) If you have diarrhea
  - (b) If you have a draining wound or any type of wet lesions; wait until lesions are crusted and dry
  - (c) If you are jaundiced
  - (d) If you have been told you have mononucleosis/hepatitis
  - (e) If you have not been treated with a medication and/ or shampoo for lice and scabies
  - (f) Until you have been taking antibiotics for at least 24 hours for a strep throat

- (g) Observe BSI
  - (i) Always wear gloves
  - (ii) If chance of splash, wear protective eyewear or face shield
  - (iii) If large volumes of blood are possibility, wear a gown
  - (iv) When contacting a possible TB casualty, wear appropriate particulate mask
- (h) Patients with coughs, headaches, general weakness, recent weight loss, stiff necks, high fevers, and taking medications suggestive of an infectious process are tip-offs in history taking, with experience, the list will get longer for you
- (i) If after a call with lice, scabies, ticks or other insect vectors
  - (i) Spray the stretcher and casualty compartment with an insecticide, then wipe off/ mop up insecticide residue
  - (ii) Bag the linen separately, and ensure that it not be taken home; bottom line is that it needs to be washed separately
  - (iii) Report any infectious exposure to the designated officer/ manager of your agency identified as such
- (2) Effective hand washing, to include the webs of the hands
- (3) The major infectious diseases that 91W Medic personnel should have in-depth knowledge of for purposes of regulatory compliance
  - (a) HIV
  - (b) Hepatitis
  - (c) Tuberculosis
  - (d) Sexually transmitted diseases
- (4) Understand the concept of occupational risk
  - (1) Appreciate that infectious agent mode of entry, virulence, dose, and host resistance factors combine to define risk, or potential for infection
  - (2) Just because there is risk, doesn't mean that you will become infected
  - (3) Not all infectious diseases are communicable and do not always pose risks to family members
  - (4) Risk and potential does not necessarily equate to probability; HIV is a good example - risks for infection may appear to be high, but the probability of occupational exposure is very low (0.2-0.44%)

**Medical and legal aspects of reporting and recording an exposure**

- (1) Out-of-hospital personnel deal with very few infectious disease emergencies, but must be vigilant about consequences to themselves, as well as their casualties and coworkers, based on daily, often unknown exposures to infectious agents

- (2) Universal/ standard precautions for soldier medics are superseded by body substance isolation guidelines, based upon the premise that all body fluids, in any situation, may be infectious
- (3) Contact Preventive Medicine for any questions concerning infectious diseases and reporting protocols

***Appendix A***  
***Insert and Remove NG Tube***  
***Competency Skill Sheets***

**NG Tube Insertion**

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

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

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

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

	1st	2nd	3rd
a. Checked doctors orders.	P / F	P / F	P / F
b. Washed hands. Removed rings and watch.	P / F	P / F	P / F
c. Gathered and assembled equipment.	P / F	P / F	P / F
d. Identified patient and explained procedure.	P / F	P / F	P / F
e. Prepared and positioned patient. (1) Removed dentures, if used. (2) Washed hands. (3) Hyperextended neck. (4) Protected patient with protective pad or towel. (5) Donned gloves.	P / F	P / F	P / F
f. Measured the tube for insertion distance (Tip of nose-proximal earlobe-tip of sternum). Marked with tape.	P / F	P / F	P / F
g. Inspected nasal.	P / F	P / F	P / F
h. Lubricated the tip of NG tube with water soluble lubricant.	P / F	P / F	P / F
i. Inserted NG tube. (1) Inserted tube into nostril while pointing tip backward and downward. (2) Stopped when first mark on tube is at tip of the nose. (3) Used flashlight to inspect back of throat. (4) Instructed patient to lower chin to chest and swallow sips of water through straw. (5) Advanced tube 3 to 5 inches each time patient swallows. (6) Continued advancing until reach second tape mark.	P / F	P / F	P / F
j. Checked tube placement.	P / F	P / F	P / F
k. Anchored tube.	P / F	P / F	P / F
l. Clamped or connected tube to suction.	P / F	P / F	P / F
m. Positioned patient with a minimum head elevation of 30 degrees, to prevent gastric reflux.	P / F	P / F	P / F
n. Removed gloves and washed hands.	P / F	P / F	P / F
o. Recorded procedure.	P / F	P / F	P / F

Instructor Comments:



**NG Removal**

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

	1st	2nd	3rd
a. Identified patient and explained procedure.	P / F	P / F	P / F
b. Washed hands and donned gloves.	P / F	P / F	P / F
c. Untapped tube.	P / F	P / F	P / F
d. Enclosed tube within the towel or glove. Discarded appropriately.	P / F	P / F	P / F
e. Removed gloves and washed hands.	P / F	P / F	P / F
f. Instructed patient on mouth care (or provide if necessary).	P / F	P / F	P / F
g. Encouraged patient to clear nose of mucus and debris.	P / F	P / F	P / F
h. Documented.	P / F	P / F	P / F

Instructor Comments:

***Appendix B***  
***Insert and Remove Foley Catheter***  
***Competency Skill Sheets***

**Insert Foley Catheter**

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

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

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

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

	1st	2nd	3rd
a. Checked doctor's orders.	P / F	P / F	P / F
b. Washed hands.	P / F	P / F	P / F
c. Gathered and assembled equipment.	P / F	P / F	P / F
d. Identified patient and explained procedure.	P / F	P / F	P / F
e. Positioned and draped patient.	P / F	P / F	P / F
f. Opened catheter tray.	P / F	P / F	P / F
g. Donned sterile gloves.	P / F	P / F	P / F
h. Positioned moisture-proof pad under patient buttocks (female) (1) Placed moisture-proof pad across upper thighs with fenestrate pad over genitalia (males) (2) Placed fenestrated pad with opening exposing genitalia for females.	P / F	P / F	P / F
i. Set up sterile field. Prepared equipment and tested balloon.	P / F	P / F	P / F
j. Cleaned genitalia.	P / F	P / F	P / F
k. Lubricated catheter.	P / F	P / F	P / F
l. Inserted catheter until urine flow is observed. Inserted an additional one inch.	P / F	P / F	P / F
m. Inflated balloon and repositioned catheter.	P / F	P / F	P / F
n. Hung drainage bag from bed frame.	P / F	P / F	P / F
o. Removed tray and secured catheter. (1) Taped to thigh of female patient. (2) Taped to abdomen of male patient.	P / F	P / F	P / F
p. Removed and disposed of gloves. Washed hands.	P / F	P / F	P / F
q. Recorded procedure.	P / F	P / F	P / F

Instructor Comments:

**Remove Foley Catheter**

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

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

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

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

	1st	2nd	3rd
a. Checked doctor's orders.	P / F	P / F	P / F
b. Washed hands.	P / F	P / F	P / F
c. Identified patient and explained procedure.	P / F	P / F	P / F
d. Positioned and draped patient.	P / F	P / F	P / F
e. Untaped catheter.	P / F	P / F	P / F
f. Deflated balloon.	P / F	P / F	P / F
h. Removed catheter.	P / F	P / F	P / F
i. Removed equipment and drainage system.	P / F	P / F	P / F
j. Recorded procedure.	P / F	P / F	P / F

Instructor Comments: