Hospital Corpsman Sickcall Screeners Handbook

BUMEDINST 6550:9A

Naval Hospital Great Lakes
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Sickcall Screeners Handbook

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Contents

Introduction

"Desert Storm" demonstrated once again that Navy Hospital Corpsmen are vital members of the Health Care Delivery Team. Their responsibilities and roles are expanding as are the demands placed on them to provide quality health care. In order to meet these demands and better prepare Hospital Corpsmen, training is a necessity. The Sick Call Screeners Course is such a program and is directed at the junior Hospital Corpsmen (E-2 to E-4). Here the Corpsmen are exposed to clinical subjects taught by a staff of highly skilled personnel (Physicians, Nurses, Physician Assistants, and Independent Duty Corpsmen). The goals and objectives of this course are:

1. To give the Corpsmen a better understanding of the clinical aspects of medicine in a Military Sick Call setting.
2. To expose corpsmen to the techniques of obtaining a history, performing a physical exam and recording their findings in an outpatient record.
3. To learn the signs, symptoms and therapy for medical problems that are common to military sickcall.

Course Description

The Military Sick Call Screeners Course is divided into modules that cover specific areas of medicine. The topics include: Dermatology, Eye, ENT, Neurology, Cardiology, Pulmonary, Gastrointestinal, Orthopedics, Sexually Transmitted Diseases, Infectious Diseases, Endocrinology, and Pharmacology. Each module contains sections on anatomy and physical examination and a number of common medical problems presented in a SOAP format.

The course is designed to be presented over a period of eighty hours. Written test and quizzes, a mid-term and a comprehensive final exam will be given. A practical examination will also be used to evaluate the student's ability to perform a physical examination.

Instructors will draw upon personal knowledge and experience and demonstrate the physical examination techniques required for each section.

Utilization of Military Sick Call Screeners

Policy and guidance for the Military Sick Call Screener Program is contained in BUMEDINST 6550.9B

The primary goal of the Military Sick Call Screener Program is to provide timely, quality care for active duty personnel with minor medical conditions. Screeners are not to function as independent providers. They must work under the direct supervision of a medical officer who is responsible for the care they provide.

The following guidelines must be followed:

1. The SOAP format must be used when evaluating a patient. This will include the history, physical examination, assessment, and treatment.
2. The Military Sick Call Screener will consult with the supervising medical officer prior to the patient leaving the treatment facility. Military Sick Call Screeners will have 100% of their records reviewed by the supervising medical officer and countersigned.
3. A screener may order a CBC and urinalysis. Any other studies must be ordered by the supervising MO/PA/IDC.
4. Screeners must realize their limitations and immediately refer to an MO/PA/IDC any patient with one of the following conditions:
    a. Febrile illness with temp. exceeding 101° F.
    b. Acute distress such as, breathing difficulties, chest pain, acute abdominal pain, suspected fractures, lacerations, etc.
    c. Altered mental states
    d. Unexplained pulse above 120 per minute
    e. Unexplained respiratory rate above 28 or less then 12 per minute
    f. Diastolic blood pressure over 100 mm Hg

    If any uncertainty or doubt in the assessment of the patient's medical condition exists, refer to your medical officer. Also, if any patient presents with the same complaint twice in a single episode of care, he must be referred to a medical officer for evaluation and treatment. The only exception is patients returning for routine follow up of a resolving acute minor illness or injury.

5. All prescriptions written will be signed by the supervising MO/PA/IDC.

SOAP Note

LTG #

Allotted Lesson Time:

References: Nursing Procedures Manual
HM 3&2

Terminal Learning Objective: Given a simulated patient with a simulated complaint, the student will be able to obtain the needed information for proper treatment of the patient.

Enabling Learning Objective: Given a list of components of a SOAP note, select by shading the correct response.

a. The information charted for each component.
b. The proper way of obtaining the information for each component.

Problem oriented medical record approach (POMR)

The S.O.A.P.(E. R.) method is the only accepted method of medical record entries for the military.

a. **S:** (subjective) - What the patient tells you.
b. **O:** (objective) - Physical findings of the exam.
c. **A:** (assessment) - Your interpretation of the patients condition.
d. **P:** (plan) - Includes the following:
    1. Therapeutic treatment: includes use of meds, use of bandages, etc.
    2. Additional diagnostic procedures: any test which still might be needed.
e. **E:** (patient education) - special instructions, handouts, use of medications, side effects, etc.
f. **R:** (return to clinic) - when and under what circumstances to return.

Components of the SOAP note.

1. Medical History - Gives you an idea of the patients problem before you start physical exam.
    a. biographic data
    b. chief complaint
        1. This is the reason for the patients visit.
        2. Use direct quotes from patient.
        3. Avoid diagnostic terms.
    c. Observation: begins as soon as the patient walks through the door.

   d. Listening: listen carefully. This will help you get an accurate diagnosis of the problem.
   e. Open ended questions: help you to get more complete and accurate information.
   f. Provider obstacles: your attitude or predeterminations may prevent you from making an accurate judgment.
   g. Patient obstacles: the patient has many obstacles to overcome. Patients must have confidence in you.
2. History of present illness/injury (HPI)
   a. Duration: when the illness/injury started.
   b. Character: use the patients words to note character of pain.
   c. Location: have the patient explain, then have them point it out.
   d. Exacerbation or remission: what makes it better or worse and is it constant or does it vary in intensity.
   e. Positional pain: does the pain vary with the change of the patients position.
   f. Medications/allergies: note any medications whether over the counter or not. Do the medications relate to the problem? Take note of the patients allergies. Do not rely on the patients health record or SF 600.
   g. Pertinent facts: facts which lead you to your diagnosis. Usually consist of classical signs and/or symptoms.

ANOTHER FASTER WAY TO TAKE A MEDICAL HISTORY IS BY USING THE KEY WORD "SAMPLE PQRST"

S: Symptoms
A: Allergies
M: Medicine taken
P: Past history of similar events
L: Last meal
E: Events leading up to illness or injury

P: Provocation/Position - what brought symptoms on, where is pain located.
Q: Quality - sharp, dull, crushing etc...
R: Radiation - does pain travel
S: Severity/Symptoms Associated with - on scale of 1 to 10, what other symptoms occur
T: Timing/Triggers - occasional, constant, intermittent, only when I do this. (activities, food)

EXAMPLE:

S) 21 y/o male c/o sore throat. No known allergies. Taking no meds. Have approx (2) ST per year. Eating and drinking normally. Was fine until yesterday morning when woke up with ST. Denies fevers, chills, sweats, SOB, & HA.

3. Past History (PH)
    a. Other significant illnesses
    b. Prior admissions
    c. History of major trauma
    d. Surgery
    e. Childhood illnesses
    f. Neurological history
4. Family History
    a. This is the pertinent history of diseases of the family within the patients bloodline.
    b. Any disease traced through the family is important. If no history found, note it on SF600.
5. Social History (SH)
    a. Drugs
    b. ETOH
    c. Tobacco
    d. Over the counter medications
6. Marital History
    a. Assist by assessing patients current condition.
    b. May help diagnose an underlying physical or psychological problem.
7. Occupational History (OH)
    a. This is a brief description of the patients job.
    b. This is of importance if the patient works around hazardous materials and chemicals.
8. Systems Review (ROS)
    a. A comprehensive account of complaints, both past and present.
    b. Double check: Recheck your work to prevent omission of significant data.
    c. Diagnosis: a systems review will allow the examiner to group the symptoms and arrive at a logical diagnosis.

Review of Systems

d. General
    1. usual weight
    2. weight change
    3. weakness, fatigue, fever

e. Skin
    1. rashes
    2. lumps
    3. itching
    4. dryness
    5. color changes
    6. hair and nails
f. Head
    1. headache
    2. head injury
g. Eyes
    1. vision
    2. corrective lens use; type
    3. last eye exam
    4. pain
    5. redness
    6. tearing
    7. double vision
h. Ears
    1. hearing
    2. tinnitus
    3. vertigo
    4. pain, earache
    5. infection
    6. discharge
i. Nose & Sinuses
    1. frequent colds, nasal stuffiness
    2. hay fever, atopy
    3. nosebleeds
    4. sinus trouble
j. Mouth & Throat
    1. teeth and gums
    2. last dental exam
    3. sore tongue
    4. frequent sore throat
    5. hoarseness
k. Neck
    1. lumps in neck
    2. pain
l. Breasts
    1. lumps
    2. nipple discharge
    3. pain
    4. self-exam

m. Respiratory
    1. cough
    2. sputum (color, quantity)
    3. hemoptysis
    4. wheezing
    5. asthma
    6. bronchitis
    7. pneumonia
    8. TB, last PPD
    9. pleurisy
    10. last CXR

n. Cardiac
    1. heart trouble
    2. HTN
    3. rheumatic fever
    4. heart murmurs
    5. dyspnea/orthopnea
    6. edema
    7. chest pain/palpitations
    8. last EKG

o. Gastrointestinal
    1. trouble swallowing
    2. heartburn
    3. appetite
    4. nausea
    5. vomiting
    6. vomiting blood
    7. indigestion
    8. frequency of BM's, last BM, change in habit
    9. rectal bleeding or tarry stools
    10. constipation
    11. diarrhea
    12. abdominal pain
    13. food intolerance
    14. excessive belching or farting
    15. hemorrhoids
    16. jaundice, liver or gall bladder trouble, hepatitis

p. Urinary
    1. frequency of urination
    2. polyuria
    3. nocturia
    4. dysuria
    5. hematuria
    6. urgency, hesitancy, incontinence

7. urinary infections and STD's
8. stones (renal calculi)

q. Genito-reproductive
    1. MALE
        a. discharge from or sores on penis
        b. STD hx and treatment, Last HIV test
        c. hernias
        d. testicular pain or masses
        e. frequency of intercourse, libido, difficulties
    2. FEMALE
        a. 1st menarche, regularity, frequency
        b. flow duration, amount
        c. bleeding between periods or after intercourse
        d. last PAP, results
        e. number of pregnancies, deliveries, abortions (spontaneous & induced)
        f. STD's hx and treatments, Last HIV test
r. Musculoskeletal
    1. joint pain/stiffness, arthritis, bachache. (describe location and swelling, redness, pain, weakness, ROM)
    2. past injuries, treatments
s. Neurologic
    1. fainting, blackouts, seizures, paralysis, weakness, numbness, tingling, tremors, memory
t. Psychiatric
    1. mood, affect
    2. nervousness, tension, depression
    3. past care
u. Endocrine
    1. thyroid trouble
    2. heat or cold intolerance
    3. excessive sweating, thirst, hunger, urination
    4. diabetes
v. Hematologic
    1. anemia
    2. ease of bruising, bleeding
    3. past transfusions and any reactions

Orthopedics

Back Problems: Affects *85%* of the population at some time.

Anatomy: The spine is composed of 7 cervical, 12 thoracic, 5 lumbar vertebrae, and the sacrum. They are separated from each other by a disc that cushions the vertebrae. To understand the back you have to understand the anatomy and know how the vertebrae - disc - vertebrae unit work.

Looking from the side you can see a hole (foramen) that serves as a window through which a nerve root from the spinal cord exists. This nerve can be pinched if the disc herniates into the intervertebral foramen. This disturbs the muscular function and effects the deep tendon reflexes the nerve controls. Each nerve serves a different part of the body. Disc problems most often affect the L4, L5, and 51 nerve roots. Evaluating the function of these nerve roots is part of examining a person with back pain

Most back problems are due to muscle stain and involve the paravertebral (para - around) muscles, which include the latissimus dorsi and trapezious muscles.

Physical Examination:

With the patient standing: Check symmetry, curvatures, ROM (range of motion) include extension, flexion and side to side; **gait,** heel - toe walking (heel walk L-5, and tiptoe S-I), and look for paravertebral muscle spasm.

> Note: A malingerer will complain of pain when pressing down on the head; and may have an abnormal gait or limp. Have patient walk backwards - it is impossible to limp backwards unless it is genuine.

With the Patient sitting: Check deep tendon reflexes (DTRs) - patellar (L4) and achilles (S-I). Check extension strength of the great toe (ability to pull it up against resistance L-5).

With the patient supine: Straight leg raising test - Raise the patients relaxed and straightened leg until pain occurs This places a stretch on nerve roots normally L-5. Then dorsiflex the foot, this will increase the pain if the nerve root is being compressed. Increased - in the affected leg when the opposite leg is raised (crossed straight leg raising sign) strongly confirms nerve root involvement.

Lower Back Strain / Pain:

A painful condition involving the lower back, related to physical activity and may be recurrent.

S: Moderate pain in the lumbar area made worse by movement such as bending.
O: Tenderness and spasm of paravertebral muscle in the lumbar area with limited ROM.
Remainder of exam is normal - no nerve root involvement.
A: Lower Back Pain
P: Bed rest may be needed, heat to area, Motrin 800 mg TID, and a muscle relaxant like Flexeril 10 mg TID.

Herniated Disc: A syndrome of severe back pain as a result of impingement of a nerve root by a bulging intervertebral disc.

S: Backache, worse with coughing, sneezing and movement. Pain may radiate into leg. May have numbness tingling or weakness in the lower leg.
O: Positive straight leg raise, decreased ROM, with altered strength and deep tendon reflexes (DTR).
A: Herniated Disc
P: Bed rest, Motrin, Flexeril, and referral to Ortho if not improved in 48 to 72 hours, may require surgery

KNEE PROBLEMS

A careful history makes the diagnosis!!!

1. Is there direct trauma or injury? If no go to #2. If so. What was the precise mechanism of injury -what happened?
2. Is it mechanical pain that is related directly to use of the knee? Worse "with bending, walking, climbing stairs, or running"
3. Is there a history of effusion?
4. Does it:
    a. lock -fixed in one position ? (Miniscal tear)
    b. click - usually normal with deep knee bends.
    c. buckle - does knee give out? (ligament instability, miniscal tear, or patellar dislocation)
    d. Pseudo buckle - gives out due to pain usually due to patellar - Femoral syndrome. No ligament instability.
5. What factors cause, worsen, or relieve pain?

ANATOMY

1. Bones: Femur with distal medial and lateral epicondyles, Patella, Tibia with medial and lateral condyles, Tibial tubical - attachment of the quads and the Fibula
2. Muscles:

   a. Quadriceps (made up of 4 muscles). They form a tendon that envelops the patella. Below the patella it is call the patellar tendon and it inserts into the tibial tubical, anchoring the quads to the tibia. The quadriceps cause knee extension
   b. Hamstring muscles Found in the back of the thigh, they cause flexion of the knee.
3. Parts of the Knee Joint:
   a. Ligaments: (hold bones together)
      Collateral Ligaments - lateral and medial
      Cruciate Ligaments - Anterior and posterior
   b. Menisci: Distributes weight over the surface of the joint and functions as shock absorbers or cushions.
   c. Patella: Our kneecap rides in the groove between the femoral condyles.
   d. Bursa: fibrous sacs of fluid that reduce friction between bones, ligaments and tendons.

PHYSICAL EXAMINATION

1. With patient standing: Check - active ROM - The patient uses his own muscles to complete ROM.
   Note: Passive ROM involves the examiner moving the patient's limbs through the ROM. This is useful when the patient can not perform active ROM.
   - Bend (flex) each knee (130 degrees of flexion)
   - Straighten (extend) each knee
2. With patient seated:
   a. inspect knee - swelling, tenderness, deformity
   b. palpate - check patellar tendon, tibial tubical, and joint line.
3. With patient sitting down:
   . Compare knees - loss of "hollows" swelling superior to the patella is usually caused by an effusion
   a. Patella movement, tenderness
   b. Check extension (passive ROM)
   c. Test medial and lateral collateral ligaments; Valgus (knock knees). Varus (bowed legs)
   d. Examine with McMurray or Apley tests to detect a torn meniscus.

COMMON KNEE PROBLEMS

Osgood Schlatters Patellar Tendinitis Pain over the tibial tubercle and into the patellar tendon. Actual injury occurs in early teens with the pulling of the patellar tendon out of its attachment at the tibial tubical. This heals with a large calcium deposit below the knee. The tendinitis is a re-inflammation of this old injury. Pain with extension of lower leg. Treated with rest and anti-inflammatories

1. Patellar - Femoral Syndrome: Pain resulting from overuse of the joint. The mechanical movement of the patella between the femoral condyles on flexion / extension causes inflammation. Affected by weakened quadriceps and abnormal tracking of the patella. There is pain in and around the patella associated with crepitus. Treated with rest and anti-inflammatories.
2. Ligament Strain: Stretching of either anterior or posterior cruciates or medial or lateral collateral ligaments (Remember that combined ligament injury is common). Pain, *mild* swelling and laxity of the affected ligaments, and weakness. Note: a tear of a ligament will produce a severe effusion or swelling, a strain will not.
   Treatment: rest, no weight bearing for 3-5 days, use crutches. Anti-inflammatories, limited duty for 2 to 3 weeks
3. Meniscus Tear: Usually caused by a rotatory mechanism of injury without a direct blow. Sudden onset of localized knee pain may lock, buckle or click. Severe swelling, weakness, and unable to bear weight. On exam severe effusion with tenderness over the joint line. Limited ROM. Positive McMurray' test.
   Refer to orthopedics, crutches, and anti-inflammatories.
4. Acute Arthritis: (usually infectious)
   a. Cellulitis: due to bacterial infection or Gonococcal infection.
   b. Gout: uric acid level increases Joint is tender, is hot, and swollen. No history of injury or trauma. Refer to MD or PA. Orthopedic consultation.

III. ANKLE AND FOOT

Anatomy:

There are seven tarsal bones. Two are very important. The CALCANEUS (the heel bone) is the largest and forms the attachment for the muscles of the calf of the leg via the achilles tendon. The TALUS rests on the calcaneus, the top is rounded for articulation with the tibia and forms the ankle joint. The talus bears the weight of the whole body which is transferred to the foot. The remaining bones of the foot are the phalanges, metatarsals, and the tarsal bones.

The ankle joint is made up of the talus, on top of which rests the tibia. At the sides of the talus are the malleoli of the tibia and fibula. They sit astride the talus like the legs of a rider over a saddle. The joint is held together by ligaments. The three important ligaments of the lateral ankle are:

1. Anterior Talofibular Ligament
2. Posterior Talofibular Ligament
3. Calcanofibular Ligament

These are important to know because 85% of ankle sprains involve the lateral ligaments. (Note: The names of the ligaments are made up from the two bones to which they attach)

The ligaments of the medial ankle arc grouped into one broad strong ligament - the deltoid ligament

Physical Examination:

Precise terms are used to describe both the anatomy and the location of injury Know the following

1. Proximal - Toward or nearest the point of attachment, or nearest the center of the body
2. Distal -Away from or furthest from the center of the body or point of attachment.
3. Extension-- A movement which brings the members of a limb into or toward a straight condition (straightening the joint)
4. Flexion - The act of bending upon itself (bending of the elbow is flexion)
5. Plantar - Refers to the bottom surface of the foot
6. Dorsal Refers to the top of the foot
7. Medial Malleolus - The part of the tibia that forms the inner or medial part of the ankle joint
8. Lateral Malleolus - The part of the fibula that covers the talus laterally.
9. Plantar Flexion - Downward flexion of the joint- an action accomplished by the gastronemous muscle via the achilles tendon.
10. Dorsiflexion - An action that brings the foot up.
11. Inversion - the movement of the sole of the foot inward (medially) so that the soles face toward each other.
12. Eversion - the movement of the sole outward (laterally) so that the soles face away from each other.
13. Abduction - the lateral movement of the limbs away from the body
14. Adduction - the movement of the limb toward the body after abduction

Ankle and Foot Examination:

Inspection: Look for swelling, redness, injury, deformity, or flat feet (pes planus).
Palpation: Feel for tenderness, swelling, heat, crepitus, check medial and lateral malleoli.
Range of Motion:

1. Inversion / eversion
2. Dorsiflexion/ plantar flexion
3. Abduction/adduction
4. Flexion/ extension of toes.

Muscles and Tendons:

1. Test strength with resistance of dorsiflexion/ planar flexion
2. Check Achilles tendon with the squeeze test

3. Check gait- walk on heels and toes
4. Check calf muscles by hopping up and down on the ball of foot
   If patient lands flat footed their is weakness in the calf muscles

Neurological Testing: Check sensation to foot with pin prick or sharp / dull test with a paper clip.
See Neurology session for details.

Ankle Sprain: Indicates ligament injury. The anterior talofibular ligament is most commonly injured with point tenderness anterior to the lateral malleolus.

S: Painful swollen ankle, may not be able to bear weight
O: Tender over anterior lateral malleolus, swelling, ecchymosis (a blue-black discoloration due to bleeding into tissue). Decreased ROM.
A: Ankle Sprain
P: May need splint, and crutches if severe.
RICE Therapy: Rest, Ice, Compression, Elevation. Motrin 800 mg TID

Hand and Wrist

Precise terms for the hand and wrist:

Palmer (or volar) - the anterior surface of the hand.
Dorsal - the posterior surface of the hand. Ulnar - toward the ulna or little finger
Note: Radial and ulnar are preferred because of the confusion over medial and lateral.
Pronation - the act of turning the hand so that the palm faces downward or backwards.
Supination - to turn the forearm or hand so that the palm faces upward

Numbering of the fingers: 1 = thumb, 2 = index finger, 3= long finger, 4 = ring finger, 5 = small finger

Bones of the hand:
Phalanges - distal, middle and proximal phalanges.
The joints in between the phalanges are named:

DIP - Distal interphalangeal joint
PIP - Proximal interphalangeal joint
MCP or MC - Metacarpophalangeal joint, where the metacarpals meet the phalanges

Nerves: The hand is supplied by three nerves - the median, the ulnar, and the radial nerves.

With no more than a paperclip an accurate test for sensation can be carried out. An injured nerve makes its presence known in three ways

1. Loss of sensation
2. Loss of motor function
3. Loss of sweating- if a nerve is lacerated the skin immediately becomes dry, so feel the skin.
   Sensation is tested using the two - point discrimination test. Use a paper clip with the points 5mm apart. Press lightly against the skin, just enough to dent the skin along the sides of the fingers never across the finger.

Hand Examination:

Inspection: swelling, redness, injury, deformity.
Palpation: Tenderness, swelling, heat, crepitus.
Active ROM: Make a fist, flex the wrist, open the hand and extend the wrist, spread fingers apart and bring back together. Thumb has 4 movements - up, down, and side to side.
Test Muscle Strength:

1. Grip strength - patient squeezes your two fingers in his hand.
2. Pinch mechanism - the patient's thumb and index finger are pinched together to make a ring, insert your index finger and pull
3. Test Tendons of the hands (common to injure with laceration):
   a. Check ability to flex DIPS
   b. Check ability to flex PIPS
   c. Check ability to flex MCPs
   d. Check thumb for abduction (moving thumb away from the palm)
   e. Check thumb for adduction (moving thumb toward the palm)

Neuro Exam: Sensory - two point discrimination
Ulnar C-8: test 5th finger
Radial C-6: test back of hand (radial side, dorsum)
Medial C-7: test the index finger on the palmar (volar) surface.
Motor:
C-6: Radial - Extension of wrist
C-7: Medial - Wrist flexion
C-8: Ulnar - Thumb adduction

Common Hand Problems:

1. Fracture of the Navicular (scaphoid): The most common of carpal fractures. Treatment is complicated if not found early however, it may not be initially seen on X-ray. Therefore if the patient has selling and tenderness localized in the anatomical snuff box

after injury, it is treated as a fracture. Splint with a thumb spica cast and repeat X-rays in 2 weeks with the cast off looking for avisible fracture line. If fractured refer to orthopedics.

2. Boxer's Fracture: Fracture of the fifth metacarpal causes the distal head of the MC to angulate toward the palm, usually the result of hitting something with the fist. Treated with an ulnar gutter splint with the hand and wrist in a functional position for three weeks.

3. SubunguaI Hematoma (under the nail): Common after hitting the distal finger or as a result of a crush type injury and may be associated with fracture of the distal phalanx. Decompression - relieving the pressure caused by bleeding under the nail - will relieve much of the pain. A hot paperclip held by a hemostat is pushed through the nail allowing drainage. This may convert a closed fracture into an open one therefore two days of antibiotic coverage is necessary. Dicloxacillin or Erythromycin 250mg qid.

4. Paronychia: This is an abscess of the skin around the base of the nail and may extend under the nail. This is only drained by incision if pus is visible. If pus is not seen and only erythema, swelling and tenderness are present, treat with warm, moist compresses, elevation, and antibiotics (Dicloxacillin or Erythromycin 250 mg QID).

SHOULDER

The shoulder is a complex arrangement of 3 bones held together by muscles, tendons, and ligaments. The clavicle attaches the shoulder to the sternum and holds the shoulder out from the trunk forming the sternoclavicular joint. From behind the shoulder joint the scapula forms two projections, the acromion and the coracoid which together with the clavicle form the glenoid fossa, a socket into which the ball like head of the humerus is cradled. This combination forms the shoulder or glenohumeral joint. A third joint is formed where the acromian process from the scapula meets the distal clavicle, the acromioclavicular (A-C) joint. The rotator cuff stabilizes the glenohumeral joint and is made up of a group of muscles: The suprapinatus, infraspinatus, teres minor, and subscapulris. The biceps tendon is held in a groove in the humerus and attaches under the rotator cuff. Bicep tendinitis with pain to the area of the biceptal groove is a common problem. Injuries may include a roptator cuff tendinitis or tear, A-C joint separation from a fall on the shoulder, and dislocation or glenohumeral instability.

Physical Examination:
Inspection: Swelling, deformity, redness, asymmetry.

Palpation: Feel for deformity, tenderness, effusion or swelling, or crepitus
Identify the clavicle, A-C joint, bicepital groove, sternoclavicular joint

Range of Motion:

Active: Ask patient to

1. Raise both arms to a vertical position at the sides of the head - both with abduction and forward flexion.
2. Scratch his back - first reaching behind the neck and then reaching behind to the small of the back.

Passive: Test for shoulder flexion, extension, abduction, adducion, external and internal rotation

Muscle Strength:

1. Check shoulder abductors with arm extended straight out from the side push downward while patient resists.

Neurological Examination: Check sensation with pin prick. Do an entire neurological examination of the hand as presented in the neurology lesson.

Common Causes of Shoulder Pain:

1. Rotator Cuff Tendinitis: The most common cause of shoulder pain. Caused by the rotator cuff getting pinched under the acromian process. Patients are usually after 40 years of age and are athletical1y active.
2. Rotator Cuff Tear: Usually after 40 years of age, caused by an injury. Abduction is severely impaired. As the patient tries to abduct the arm, a characteristic shoulder shrug is produced.
3. Bicipital Tendinitis: Inflammation of the biceps tendon producing pain in the bicipital groove.
4. Dislocation: Tends to occur after falling on an outstretched arm. 95% are anterior dislocation and the humeral head is palpable anteriorly. Reduce as soon as possible. Refer to MD/PA.

FRACTURES

Any break in the continuity of a bone as a result of trauma.

S: Recent trauma, or repeated vigorous physical activity. Pain over affected area. May have swelling, bruising (ecchymosis), deformity, and restricted movement.
O: tenderness at the site, may have edema/swelling, crepitus, deformity, loss of motion, and restricted use of involved area. Check pulses and neurological status. Stress fractures may have no other findings except for worse pain with activity and relieved by rest.
A: Fracture

P: X-rays usually required to confirm diagnosis. Stress fractures may require a bone scan. Minor, non-displaced fractures: Immobilization, no weight bearing, pain medication and Orthopedic referral. Major fracture: Immediate orthopedic referral.

The Eye

Anatomy:

External Eye

A. Eyelids Composed of skin, conjunctiva and muscle. Function
    1. To distribute tears over the surface of the eye
    2. To talk about this To limit the amount of light entering it
    3. To protect it from foreign bodies.
B. Conjunctiva**:** a thin membrane covering most of the anterior eye and tie inner surface of the eyelid in contact with the globe. Protects the eye from foreign bodies and drying out.
C. Lacrimal gland**:** Located in the lateral superior eyelid produces tears that moisten the eye. Tears drain via the lacrimal sac into the nasal cavity.

Internal Eye: Made up of three separate coats or tunics. The outer fibrous layer is made up of the sclera posteriorly and the cornea anteriorly. The middle coat or choroid is made up of the choroid posteriorly and the cilliary body and iris anteriorly. The inner coat is the retina.

A. The sclera appears as the white of the eye and forms the structural support for the eye.
B. The cornea is a continuation of the sclera can sense pain and separates the aqueous humor of the anterior chamber from the external environment and transmits light through the lens to the retina.
C. The iris is a circular muscle that gives eyes their color. The hole in the center of the iris is the pupil. The iris controls the amount of light going through the pupil by dilating and contracting.
D. The lens **is** located right behind the iris. It is a transparent crystal that is very elastic. By stretching it the thickness changes allowing images from varying distances to be focused on the retina. Note: as people age the lens tends to dry and become less elastic causing people to have problems reading- having to hold a book two feet away to focus on the page (Presbyopia).
E. The retina is the sensory nerve network of the eye — changing light impulses to electrical impulses, which are sent via the optic nerve to the brain.

Physical exam:

1. Test visual acuity —Snellen chart at 20 feet is best screening method, "cover one eye and read the smallest line possible". Visual acuity is expressed as two number

20/30. The first number is the distance in feet from chart, the second the distance at which a normal eye can read the line of letters. Vision of 20/200 means that the patient can read print at 20 feet that a person with normal vision could read at 200 feet. You can test visual acuity with any available print.

2. Inspection of eyelids, conjunctiva and sclera-
   Observe eyelids for redness, swelling, and lesion's. Inflammation of an eyelash follicle with a lump called a sty or hordeolum is usually caused by staph. Check the position of the upper lid — it should cover a sty or hordelum is usually caused by staph. Check the position of the upper lid — it should cover the top part of the iris only but not the pupil. Ptosis is present when the upper eyelid droops over the pupil
   Check the conjunctiva and sclera for redness color or discharge. A yellow sclera indicates jaundice. Ask the patient to look up as you depress both lower lids with your thumb exposing the sclera and conjunctiva. A special exam is done if you suspect a foreign body — eversion of the upper eyelid. Ask the patient to look down, pull downward and forward on the eyelashes. Place a "Q" tip 1 cm above the lid margin and push down on the upper lid everting it
3. Pupils — Inspect the size and equality of pupils.

   Test the pupillary response to light — shine light obliquely into each eye. Look for:

   a. Direct reaction (constriction of the same eye)
   b. The consensual reaction (pupillary contraction in the opposite eye).

4. Extra ocular Eye Muscles:
   Ask patient to watch your finger as you move it in six directions (think of a capital H) Watch for Nystagmus — the involuntary rhythmic rapid movement of the eye.

Clinical Eye Problems:

Eye Lid Problems:

1. Blepharitis — the most common inflammation of the eyelids caused by seborrhea or bacteria (staph infection) — frequently associated with conjunctivitis.
   S: Burning irritation, itching and redness of the eyelid.
   O: Scaly or granular matter clinging to the eyelashes with red-rimmed eyes, pruritus
   A: Blepharitis
   P: Remove scales with warm compresses and gentle scrubs.
   Treated with Erythromycin Ophthalmic Ointment (Ilotycin) apply to lids 2-4 x QD. Refer to MD/PA if not improved.

2. Hordeolum (sty) and Chalazion.
    A. Hordeolum is an acute lesion at the eyelid margins usually in the sebaceous glands caused by a staph infection. If a sty becomes chronic it may evolve into a chalazion, an enlargement of the meibomian gland due to a blockage of the duct. A hordeolum is painful, a chalazion is painless.

        Hordeolum
        S: Painful swelling of the eyelid, a "foreign body" sensation, no vision changes.
        O: tender, swollen lesion along the lid margin with a small center of induration, and erythema. If seen later a yellowish spot indicating the localization of the infection into a small abscess, and /or purulent drainage may be seen.
        A: Hordeolum (sty)
        P: warm compresses three or four times a day for 10 — 15 minutes.
        Erythromycin Ophthalmic Ointment (Ilotycin) 3 or 4 times daily.
        If systemic antibiotics are indicated because of cellulitis refer to MD/PA.

        Chalazion
        S: Hard, non-tender swelling of the eyelid possibly proceeded by sty.
        O: Firm, cystic swelling of the eyelid, conjunctiva, may be red in the region of the chalazion.
        A: Chalazion
        P: Refer to MD/PA for referral to Ophthalmologist for excision.

<u>Eye Inflammation Problems</u>

1. Conjunctivitis An inflammation of the conjunctiva, a mucous membrane that lines the inner portions of the eyelids (palpebral) and covering the anterior surface of the eyeball (bulbar or bulb), may be due to bacteria, viral, or allergic causes.

    S: Sensation of burning, itching or foreign body with irritation, photophobia, tearing, and a discharge that may cause the eyelids to stick together.
    O: Red, injected conjunctiva, clear cornea, pupils react normally.
    Discharges as follows:

    1. Bacterial — profuse purulent exudate (true Pinkeye).
    2. Viral — mucupurulent discharge (minimal amount) with profuse tearing.
    3. Allergic — minimal mucoid watery discharge with severe itching

    A: Conjunctivitis
    P: Check and document visual acuity.

If indicated check for foreign body or corneal abrasion by staining eye with a Fluor Strip. Do not patch the eye!

Bacterial:

4. Sodium sulfacetamide (sulamyd) ointment or solution. (Note: Solution needs refrigeration).
   Solution: one-gtt q 4-6 hours into lower conjunctival sac.
   Ointment: q.i.d. and at bedtime or HS
5. Gentamicin (Garamycin) ophthalmic solution and ointment: instill one gtt q 4 hours or small amount ointment 2-3 x qd, or
6. Erythromycin Ophthalmic Ointment (Ilotycin) q.i.d.

Viral: No treatment, self-limiting lasting about 10 days. Usually treated with one of the bacterial medications to prevent bacterial infection.

Allergic: Antihistamine orally may help. (Dimetapp, CTM or Sudafed). Vasocon-A, (for allergic conjunctivitis) one to two gtts 2-4 x qd.

2. Iritis (acute Uveitis) An acute inflammation of the iris characterized by pain, photophobia and blurring of vision, a red eye without purulent discharge and a small pupil, -contracted (miosis); it is thought to be a hypersensitivity reaction to some other infection in the body probably bacterial or fungal. In this condition a dilation medication is used to prevent the adherence of the iris to the lens. In conjunctivitis vision is not blurred, pupillary responds normal, a discharge is present and there is no pain or photophobia.

   S: Acute onset of pain, redness, photophobia and blurred vision.
   O: Pupil is miotic (constricted) small and may be irregular. Decrease in visual acuity due to blurred vision, eye is diffusely red, no discharge.
   A: Iritis (uveitis)
   P: Immediate referral to MD/PA. Consult to ophthalmology.

   Treatment:

   Analgesic ASA for pain, dark glasses for photophobia
   Mydriatic drugs: Keep pupil dilated with Atropine Ophthalmic solution 1-2 gtts up to four times a day. Ophthalmic Corticosteroids for inflammation will be give. This condition is not that common — but one that can not be missed!

3. Corneal Abrasion: One of the most common conditions seen, associated with contact lens misuse and foreign bodies. Part of the epithelium of the cornea is removed producing severe pain and tearing. Motion of the eye and blinking

increase the pain and the foreign body sensation. Examination should be made after a drop of topical anesthetic is instilled. Identification of the defect is with fluorescein strip. In the presence of a corneal abrasion the upper lid should always be looked at for a foreign body. If present remove with a gentle wipe with a moistened "Q" tip.

S: Foreign body sensation, increased tearing and irritation
O: Injected conjunctiva, tearing (lacrimation), foreign body seen in the eye or obvious corneal defect with Fluor-staining of the eye.
A: corneal abrasion
P: Test and document visual acuity.
Removal of foreign body (MD/PA)
Bacitracin, Garamycin or Emycin ointment should be instilled into the conjunctival sac, Pressure patch the eye for 24 hours and recheck.

Note: To patch an eye place a folded oval patch over the closed eye then place an open pad on top of the eye and apply tape above the brow and bring it down diagonally across the patch to the cheek.

Dermatology

1. FUNCTIONS OF THE SKIN
    a. Protection: a barrier against the unfriendly environment-keeping us in and the world out
    b. Heat Regulation: The body loses heat by evaporation of sweat and by increased blood flow to the skin.
    c. Sensory Perception: Fine touch, pressure, temperature, and pain.
2. LAYERS OF THE SKIN
    a. Epidermis: provides the major part of the barrier
    b. Dermis: contains blood vessels, provides support and nutrition for the epidermis, and is home to the nerves, sweat glands, hair follicles, and sebaceous glands.
    c. Subcutaneous Fat Layer: provides insulation from cold and injury.
3. SKIN APPENDAGES
    a. Sweat Glands: heat regulation and water and salt excretion.
    b. Sebaceous Glands: found next to the hair follicles. They produce sebum which lubricates the skin and in larger quantities causes acne.
    c. Hair: cosmetic importance.
    d. Nails: protect the finger tips.
4. SKIN LESIONS AND CLINICAL DIAGNOSIS
    a. The first and most importance step is to characterize the appearance of each skin lesion:
        1. Distribution on the body-localized or generalized over the body
        2. Arrangement-grouped or isolated
        3. Configuration-linear, annular (ring shaped), irregular (no pattern)
    b. Primary and Secondary Lesions:
    Primary Lesions are the first to appear on the initial presentation. Then the patient begins scratching or treats them, or they become infected. Over time the primary lesions become obliterated by the secondary lesions.
    Primary Lesions:
        1. Macule-a flat small (1cm) localized change in the color of the skin (a freckle,1st degree burn)
        Two types: Erythema-redness due to capillary dilation, they blanch with pressure
            - Purpura-(purple-ish), do not blanch, they are deposits of blood.
            - Petechiae: very small (2mm) purpura.
            - Ecchymosis: large purpura
        2. Papule: small (1cm) solid elevated lesion.
        3. Plaque: a large papule.
        4. Wheal: (hives/urticaria) a temporary edematous elevation usually with erythema.

5. Vesicles: small(1cm) fluid filled lesion (blister). Example: herpes, chicken pox.
6. Bulla: a large vesicle
7. Pustule: a pus filled vesicle (acne)
    - Furuncle-large pustule, deeper involvement
    - Carbuncle-several furuncles together
    - Abcess-a deep collection of pus
8. Comedo: a plug of sebum and bacteria in the hair follicle causing acne.

Secondary Lesions:

9. Scales: spontaneous shedding of the outer layer of the skin as in dandruff.
10. Crusts: an accumulation of dried fluid (serum or pus) on the skin surface. Usually the result of the rupture of a vesicle or pustule, as seen in the honey colored crusts of impetigo.
11. Excoriations: loss of skin due to scratching.
12. Erosion: superficial loss of epidermis.
13. Lischenifiication: a thickening of the skin due to prolonged scratching. Hallmark of eczema.

5. History: Questions to Ask
    a. What is the problem you are having with your skin?
    b. How long have you had it? Acute, chronic, or recurrent?
    c. What did the rash look like when it first started?
    d. Does it itch?
    e. How have you treated it?
6. Examination of the Skin: Examine the patient in good light, with exposure of the entire body.
   There are six signs to identify:
    a. Type of lesion: macule, papule, vesicle, etc.
    b. Distribution: Location on the body-local or generalized.
    c. Arrangement: isolated, grouped.
    d. Shape of Lesion: linear, annular
    e. Color: Red or purple, does it blanch?
    f. Palpation of lesion: soft, firm, hard, moist, or dry?
7. Laboratory Aids:
    a. Gram stains for bacteria
    b. KOH for fungi or yeast.
    c. If vesicular, take a glass slide and obtain a direct smear of the base for giant cells as in Herpes.

8. Clinical Dermatological Problems:
    a. Acne: Disease of sebaceous glands with onset of puberty. Comedos, pustules and erythematous papules on the face, chest, or back.

        S: "Pimples" or "Zit"
        O: Comedos (blackheads) and pustules on the face, chest, or back which may result in pitted scars.
        A: Acne
        P: Keep hands off the face and avoid squeezing lesions. Wash face BID.

        - Benzoyl Peroxide 5% applied once or twice daily
        - Retin A applied once daily
        - Tetracycline 250mg, two BID
        - Erythromycin 250mg, two BID

    b. Folliculitis/Furuncles/Carbuncles:

        Folliculitis is a localized infection of a hair follicle. Furuncle is a large deep follicular infection. Carbuncle is a large coalescence (joining together) of furuncles with several draining points usually found on the neck, back, or thighs.
        S: Skin is painful, red, and swollen
        O: Lesions vary in size, very tender and erythematous. Initially they are firm, but centers become fluctuant (movable and compressible). Regional lymphadenitis (inflamed lymph nodes may be present.)
        A: Folliculitis, Furuncle, or Carbuncle
        P: Folliculitis: Clean with soap and water, apply hot packs for 20 minutes QID

        - Furuncle/Carbuncle: I&D when fluctuant
        - Antibiotics: Dicloxacillin 500mg QID for 10 days or Erythromycin 500mg QID for 10 days or Velosef 500mg QID for 10 days.

    c. Impetigo:

        An infection of the superficial layers of the skin caused by strep or staph bacteria.
        S: A spreading of rash or sores
        O: Honey colored crusted lesions usually of the face, with a erythematous base.
        A: Impetigo

P: Dicloxacillin, or Erythromycin, or Velosef 500mg QID for 10 days.

d. Cellulitis:

This is a deep infection of the skin caused by strep and staph. Patients with cellulitis of leg often have a preexisting lesion that acts as a portal of entry for the bacteria. Always check between the toes because tinea pedis may provide the portal of entry.
S: Patient may feel ill, usually have a fever. Has a large area of erythema that is swollen and painful.
O: Lesions that is red, warm, swollen, and tender. Lymph nodes tender and enlarged.
A: Cellulitis
P: Warm soaks, bed rest, keep part elevated
Dicloxacillin, Erythromycin, or Velosef 500mg QID for 10 days
If not improved may need IV antibiotics
Facial cellulitis, common around the eye, requires hospitalization and IV antibiotics.
Refer to MD/PA

e. Pityriasis Rosea:

A self-limited mild, scaly, erythematous skin eruption occurring primarily in adolescents and young adults, lasting about 5 to 8 weeks.
S: A fine scaly rash, mild itching, but patient feels well
O: Oval papules and plaques with a delicate scar near the border of the lesions. Preceded by a "Herald Patch" Distributed generally, following the cleavage lines of the trunk-a pattern likened to a Christmas tree.
A: Pityriasis Rosea
P: No treatment is usually required
Test for syphilis with an RPR

f. Psoriasis: (over production of epidermis)

Psoriasis is a chronic disease characterized by over production of new skin. Instead of taking 19 days to replicate it takes only 1.5 days causing the skin to thicken forming the classic silver scale. Lesions have an irregular shape with a sharp border and a red base topped by a silver scale. The scalp, elbows, knees, groin, and feet are more commonly involved.
S: Itching may be mild to severe

O: Erythematous plaques covered with silvery scales. Pitted nails in 50% of patients
A: Psoriasis
P: Sunbathing or ultraviolet light treatments
Coal Tar compounds
Westcort Cream TID

g. Tinea Infection: (fungal)

Infection of the skin causing scaling, pruritis, and a red lesion with an elevated boarder. The most important lab test in the diagnosis of tinea is the potassium hydroxide or KOH preparation.. The KOH dissolves normal cellwalls leaving the fungal cells visible, appearing as hyphae and spores when viewed under low power.

0. Tinea Cruris: an infection of the groin referred to as jock itch"
S: Burning, itching sensation in the groin
O: Lesions with scaling and an erythematous base and an elevated border. Lab-skin scrapings from the leading edge of the lesion show typical hyphae when prepare with KOH.
A: Tinea Cruris
P: Wear loose-fitting cotton underwear Clotrimozole (Lotrimin, Mycelex) or Econazole (Spectozole) or Miconazole (Monistat Derm) or Tolnaftate (Tinactin, Pitrex). All of these are applied BID.
1. Tinea Pedis: Infection of the feet, the most common area affected. 2 types:
    1. Interdigital-macerated scaling process between the toes
    2. Vesiculopustular-vesicles and pustules on the instep-suspect tinea. A KOH PREP taken from the underside of the roof of the vesicle or pustule will reveal fungal hyphae.

       Treatment: same as for tinea cruruis.

ii. Tinea Versicolor (varied color): Lesions are usually found on the trunk and upper arms and may vary in color from white to pink to tan, Usually asymptomatic. Diagnosis by KOH.

Treatment: Selsun shampoo: allow to dry on skin overnight, and showered off in AM.

Repeated for 3 days. Note: It takes months for skin color to return to normal.

h. Seborrhea: (over production of sebum)

A chronic, superficial, inflammatory process with erythema and scaling affecting hairy regions of the body, especially the scalp, eyebrows, and face. S: A scaly, pruritic rash on the scalp, eyebrows, and face
O: Dry to oily yellowish scales with erythema, secondary infection frequently present.
A: Seborrhea
P: Scalp: Shampoos with sulfur, coal, tar, or selenium sulfide, rub into scalp, rinse off in 10 minutes. Topical steroids like Hydrocortisone Cream 1%, apply TID.

i. Eczema:

Eczema is a descriptive term only, not a specific disease. Under eczema are grouped skin problems that have eczematous inflammation consisting of redness, scaling, and vesicles and always itch. If it doesn't itch, don't consider eczema. If left alone eczema would resolve spontaneously, however with itching comes the scratching and irritation and thus develops the disease. Acute eczema itches intensely. Patients scratch the eruption even while sleeping. A hot shower temporarily relieves itching because the pain produced by hot water is better tolerated than the sensation of itching, heat aggravates acute eczema.
There are two stages to this problem and each has specific looking lesions.

i. Contact Dermatitis (Eczema)

This is an inflammatory response to a substance that has come into contact with the skin. There are two types:

1. Irritant contact dermatitis: has a direct toxic effect on the skin. Includes acids, alkalis, solvents and detergents.
2. Allergic contact dermatitis: triggers an immune response that causes tissue inflammation. Includes metals, plants

(poison ivy), and medicines.
S: Itching, stinging, or burning at the site of contact. Erythema, vesicles, open weeping lesions.
O: Erythema, edema, vesicles, bullae, or weeping lesions may be present. The area is usually defined.
A: Contact Dermatitis
P: Antihistamines for pruritis:

a. Atarax 25mg PO q6 hours

Topical steroids for inflammation:

b. Hydrocortisone 1% or Westcort, or Aristocort creams, applied 3 to 4 times daily.
c. Burrow's solution (Domeborrows)-wet dressings dry weeping lesions.
d. Oral Steroids-for more severe cases esp. if due to poison ivy.
e. Watch for signs of secondary infection.
f. Lubricating oils and creams are helpful.

ii. Atopic Dermatitis:

This is a chronic, pruritic, eczematous (redness, scaling, vesicles.) condition of the skin that is genetically determined and associated with a personal or family history of atopic disease (asthma, allergic rhinitis, dermatitis). Pruritis is the most distressing and prominent symptom. Lichenification is the clinical hallmark of atopic dermatitis.

Secondary infection is common. In adults distribution includes the neck, face, upper chest, and the antecubital (anterior flexor surface of the elbow) and the popliteal fossae (back of the knees).

First priority in treatment is stop the scratching.
S: Pruritis, scaling, dry, thickened skin
O: Red, weeping, and crusted lesions,

lichenification, pruritis, usually found on the face, neck, and extremities. May have infection of excoriated (scratched) areas.
A: Atopic Dermatitis
P: Same treatment as for contact dermatitis.

j. Urticaria (Hives): An immunologic response to an allergenic stimuli as with drugs and foods, or a response to physical stimuli as with cold, pressure, sunlight, or rubbing/stoking of the skin (Dermographism). Characterized by a generalized distribution of wheals (hives), itching, and erythema. Lesions vary in shape from round or oval to confluent. There may be involvement of the lips, toungue, or eyelids. Hives may last a few hours to a few weeks. If allergic response is severe it may lead to anaphylactic shock, respiratory distress, and sudden death.

S: Hives, Itching
O: Pruritis, raised wheal-like skin lesions on any area of the body, erythema.
A: Urticaria
P: If possible remove the cause.
Antihistamines:
During the day: Seldane one tab PO BID, little sedation
Evening: Atarax 10 to 25mg every 6 hours, if nor responsive to Atarax try
Diphenhydramine (Benadryl) 50mg q 6 hours.
In severe cases (anaphylactic shock):
Epinephrine 1:1000 .3 to .5ml IM
Benadryl 50mg IM
Refer to MD

k. Scabies:

A parasitic infection of the skin. The female burrows into the skin, deposits eggs which hatch in 1-2 weeks. Areas of involvement include the fingers, wrist, elbows, waist, and penis. Burrows. Nodules, or vesicles may be visible. Diagnosis is confirmed by scraping the lesion and adding mineral oil to the slide and identifying the parasite or its eggs under low power.
S: Itching, worse at night. Small red bumps on the sides and web spaces of the fingers and wrists.
O: Pruritic, may see burrow, nodules on the penis, usually involving the fingers and wrists. Scabies identified by scraping.
A: Scabies
P: Kwell Cream. Apply to all skin surfaces below the neck and

wash off in 8 to 12 hours. Reapply to hands if they are washed. It is normal to continue to itch for days or weeks after treatment-further use of Kwell may cause dermatitis and worsen itching. Need to treat family or roommates. Repeat application in one week if scabies are identified.

l. Pediculosis Pubis (pubic or crab louse):

An infestation with lice that is transmitted by close contact. They live on, rather than in, the body, feeding 5 times a day. They are active and can travel quickly and survive for a week when separated from a host. Lice and eggs (nits) can be found cemented to the bases of hair shafts close to the skin.
S: Itching of the affected area
O: Lice and/or nits seen in pubic area
A: Pediculosis Pubis (crabs)
P: Kwell Cream or shampoo. Check the pharmacy section for proper use.

m. Warts (Verrucae):

The common wart or verrucae is flesh colored, dome shaped, firm papule that has a corrugated surface. It interrupts the normal skin lines and is studded with black dots which are thrombosed capillaries (a useful diagnostic sign-easily seen after paring or slicing away the surface of the wart). The normal skin line return when the wart is gone-a good sign of cure. The hands are the most common site but warts may be found on any skin surface. Warts are caused by the human papillomavirus (HPV). On the feet they are called planar warts. They are flat because of the constant pressure. Flat warts are usually found on the forehead. Subungal and periungal warts-found under and around the nails, are resistant to treatment because much of the wart may be submerged under the nail.
S: Wart-anywhere on the body
O: Flesh colored firm growth, shape, size and appearance may vary. Normal skin lines interrupted.
A: Warts (Verrucae)
P: Treatment varies:

i. Cryotherapy (freezing) with liquid nitrogen (Do not freeze warts on the feet)

ii. Salicylic acid plasters (Mediplast), cut to the size of the wart and apply. Follow instructions found in the pharmacy section.
iii. Retin A cream applied at bedtime over the entire area involved will usually clear flat warts to the forehead. Note: Genital warts and mulluscum contagiosum are covered in the STD section.

n. Skin Cancers:

Prime risk factor is intense sun exposure-use sun screens especially if fair skinned. Patients should be asked about any new, slowly growing lesions that are flesh colored, any history of bleeding or ulceration of lesions. Areas of maximum solar exposure are at risk. In malignant melanoma-look for any pigmented lesion that has an irregular boarder, variations in color, especially blue.

Ear, Nose, and Throat

A. Examination of the Ear:

1. External ear (auricle or pinna) — Inspect each ear and surrounding tissue for deformity, lumps or skin lesions. If ear pain, discharge or inflammation is present, move the auricle up and down and press the tragus. Movement of these structures is painful in acute otitis externa, but not in otitis media.

2. Ear Canal and Drum (Tympanic Membrane or TM) — When using the otoscope, grip the auricle firmly while pulling upward, back and slightly out. Using the largest speculum that fits, insert it into the ear, holding the otoscope braced against the patient's head.

   Identify any discharge or foreign bodies, redness or swelling. Cerumen may obscure your view and need removal prior to evaluation of the eardrum. In acute otitis externa, the canal is often swollen, narrowed, moist, pale, tender, and filled with debris.

   Inspect the ear drum for color and contour. In acute otitis media, the eardrum is red and bulging. Is the eardrum mobile with valsalva or pneumatic attachment?

   Locate Landmarks: Remember — landmarks are obscured with otitis media and acute perforation !

   a. Umbo — central bulge where the malleus attaches to the drum.
   b. Light reflex — a line of light from the umbo pointing forward and down. Inspect for perforations; the normal drum is translucent, pearly gray color.
   c. Handle and short process of the malleus — superior to umbo.

3. Hearing: Whisper a word (like baseball) about one foot away from the ear. If the patient can't hear the word, he has at least a 30% hearing loss.

B. Examination of the Nose and Sinuses:

1. External Nose:
   Inspect for deviations in shape. Observe for discharge from the nares, (watery, mucoid, purulent) From one or both sides. A bilateral watery discharge associated with sneezing and nasal congestion indicate an allergy. Mucus discharge is typical of rhinitis while bilateral purulent (pus) discharge is typical of an upper respiratory infection (URL). One sided purulent, thick greenish and extremely malodorous discharge may indicate a foreign body.

2. Nasal Cavity:
   To examine the nasal cavity spread the nares by pushing up on the tip of the nose. Using an otoscope with a wide nasal speculum or a hand held nasal speculum inspect:
   a. The nasal mucosa, note color, swelling or discharge (clear, mucus, purulent)
   b. Inspect the inferior and middle turnbinates
   c. Nasal septum noting any deviation, inflammation or perforation.
   d. Inspect for polyps (pale masses that usually hang down from the middle turbinate) or other abnormalities.

3. Examination of the Sinuses:
   To palpate the frontal sinus for tenderness use your thumbs and press up from under the bony brow (right under eyebrows). Avoid pressure on the eyes. Then press up on each maxillary sinus by pressing under the zygomatic processes.

   Next percuss the sinus areas to detect tenderness. Lightly tap directly of each sinus area with your finger. Another method is to transilluminate the sinuses in a dark room. Place a light under each brow close to the nose. Shield the light with your hand. Normally you will see a dim red glow as light is transmitted through the air filled sinus. Repeat the process with light shinning downward just below the inner aspect of each eye. Look through the open mouth for the reddish glow. Absence of the red glow suggest thickened secretions in the sinus.

C. Examination of the Mouth and Throat (Pharynx):
   1. The patient must open mouth widely. With a good light and tongue blade inspect the inner cheeks (Buccal mucosa) for color, ulcers, white patches.
   2. Teeth — check for caries or broken teeth.
   3. Gums — check for infection, inflammation, swelling or bleeding.
   4. Tongue — look at the top, bottom and sides.
   5. Throat (Pharynx) — With mouth open ask patient to say "ah" if you can not see the pharynx use a tongue blade. Ask for an "ah" and note the rise of the soft palate (a test for the 10^{th}, Vagus cranial nerve). Inspect the soft palate, anterior and posterior pillars, uvula, tonsils and posterior pharynx. Note any evidence of exudate, swelling, ulceration or tonsillar enlargement. White patches of exudate associated with redness and swelling suggest acute exudative pharyngitis (strep).

D. Examination of the Neck:
   Inspect for masses or asymmetry. Evaluate range of motion and palpate for midline position of the trachea. Inspect and palpate for lymph notes. If a node is enlarged or tender look for a source in the area that it drains. Tender nodes

suggest inflammation; hard or fixed nodes suggest malignancy. Is it a node, muscle or artery: Remember you should be able to roll a node in two directions — up and down, and side to side — a muscle or artery will not pass this test.
Check for nuchal rigidity — touch chin to sternum. Pain is a sign of meningeal irritation (see NEUROLOGY LESSON)

Diseases of the Ear, Nose, and Throat

1. External Otitis: (Swimmer's Ear):
   Is there a history of recent water exposure or mechanical trauma (cotton applicator Q-Tip)? External otitis is caused by bacteria that grow in the presence of moisture, but not in an acidic environment. This problem can be prevented with drops made of 2/3 alcohol and 1/3 vinegar that are used after swimming. External otitis is defined as inflammation of the external auditory canal.

   S: Pain to the ear may be intense, occasionally a decrease in hearing or a sensation of obstruction in the ear is present.
   O: Examination reveals erythema and edema of the ear canal often with purulent exudate. Pain is aggravated by pulling on the auricle or pushing on the tragus. If the canal is very swollen the ear drum may not be visible. The Tragus is usually normal.
   A: Otitis Externa
   P: Gently remove any debris from the canal so medication may gain entry into it. Cortisporin Otic Suspension 4-5 gtts qid for 7 days. Tylenol for pain. Occasionally, due to excessive swelling, an otowick must be placed in the canal to get the medication inside. Replace every 24 hours.

2. Sinusitis:
   Sinusitis usually follows an URI and occurs when an undrained collection of pus accumulates in a sinus due to viral, allergic or bacterial causes. The maxillary sinus is the most commonly affected with pain and pressure over the cheek. Pain and pressure of the forehead indicate a frontal sinusitis.

   S: Bacterial — Mucopurulent nasal discharge, ache behind eyes, toothache like pain, usually worse at night and early morning, and with bending over.

   Non-Bacterial (viral) — Clear nasal discharge, post nasal drip with resulting cough, headache, and pressure sensation in sinuses
   O: Yellow to green discharge (bacterial) or clear mucuoid discharge (non-bacterial) tenderness over sinuses, may have fever, poor transillumination of sinuses. X-rays may show clouding or air/fluid levels.

A: Sinusitis
P: Antibiotics: Septra DS one BID for 10 days or Amoxicillin 500 mg TID for 10 days
Ampicillin 500 mg QID for 10 days.
Decongestants: Sudafed 60 mg QID or Entex LA (Duravent) one BID
Nasal decongestant Spray: Afrin N.S. BID for 3 days.
Tylenol for pain and fever.

3. Acute Pharyngitis / Tonsillitis:
Inflammation of the throat, may or may not have fever, swelling or tender lymph nodes, or purulent exudate. Usually of bacterial or viral etiology.

S: Sore throat, painful swallowing, fever, URI
O: Throat appears red, may have pustular exudate or enlarged tonsils. Tender lymph nodes may be present.
A: Acute Pharyngitis or Tonsillitis
P: Throat Culture to rule out group A beta-hemolytic strep infection.
Tylenol for pain or fever. Cepacol Lozenges as needed.
If culture is positive for strep infection treat with:
Bicillin 1.2 million units, IM and /or
Penicillin VK 250 mg QID for 10 days (must take for full 10 days)
Erythromycin 250 mg QID for 10 days.

NOTE: If the examination is highly suspicious for strep infection, i.e. fever, swollen tender nodes, beefy red throat with pustular exudate, then treatment may be started prior to obtaining culture results, just do not skip obtaining the throat culture.

E. Auscutation of lung fields: Abnormal breath sounds of the lungs are of two types:
   a. Crackles (old nave was rales) — are intermittent, non-musical, very brief sounds. They sound like rubbing hair between your fingers. Notice if they are heard on inspiration or expiration. These sounds are produced when previously closed airways open suddenly in the smaller airways.
   b. Continuous or of longer duration then crackles with a musical sound. There are two types:

      1. Wheezes: high pitched musical sound caused by a relatively high velocity air flow through a narrowed airway.
      2. Rhonchi: deeper, have a snoring quality, caused by the passage of air through an airway obstructed by secretions. Tend to disappear after coughing.

Now repeat the examination on the anterior chest:

1. Inspect chest
2. Palpation of chest
3. Palpation for tactile fremitus
4. Percussion of anterior thorax
5. Auscultation of anterior chest

Respiratory System

ANATOMY

The chest or thorax is a cage of bone, cartilage, and muscle used to expand the lungs. It is made up of the sternum, 12 pairs of ribs attached by the costal cartilage anteriorly and to the 12 thoracic vertebrae posteriorly. Muscles of respiration are the diaphragm and intercostal muscles of the rib cage. There are three major divisions of the chest, the right and left pleural cavities each containing a lung and the medistinum located between the lungs containing the heart.

The trachea and bronchi form a tree like structure that transports air from the environment to the alveoli. The trachea branches into bronchi and then into bronchioles terminating in the alveoli where the oxygen and carbon dioxide exchange takes place. The bronchioles have smooth muscle wrapped around them and are lined by a mucous membrane.

The pleura are serous membranes that line the thoracic cavity and cover the lungs. Parietal refers to wall; therefore the layer that lines the walls of the chest is called the parietal pleura. The layer that covers the lung is called the visceral pleura. Between these layers is the intraplueral space occupied only by a thin film of lubrication fluid. This space is a potential space not normally present unless air gets in between the layers.

PHYSICAL EXAMINATION

To be able to communicate the location of abnormal findings in the chest you must know the location of imaginary lines of reference drawn to the chest. Become familiar with these:

1. Midsternal Line
2. Midclavicular Line
3. Anterior Axillary Line
4. Midaxillary Line
5. Posterior Axillary Line
6. Scapular Line

The lungs are also divided. The right has 3 lobes, and the left 2 lobes.
Know the location of the following landmarks:

1. Sternal angle of the angle of Louis
2. Suprasternal notch
3. 2nd Rib-found lateral to the sternum angle of Louis. Below it is the 2nd interspace between the ribs. Using two fingers you can "walk" down the interspace.

THE EXAMINATION: Proceed in an orderly way beginning with a complete exam of the posterior chest first, followed by the anterior chest.

1. Inspect: Look for deformity, retractions with inspirations, or a displaced trachea. Observe rate, depth and effort of breathing. Listen for wheezes, etc.
2. Palpation: Check for areas of pain, masses, and feel for the movement of the chest on deep inspiration. Palpate for tactile fremitus (vibrations felt through the chest wall by palpation). Using your palm at the base of the fingers palpate having the patient repeat the words "ninety-nine". Fremitus is decreased with pnuemothorax and increased when transmission of sound is increased as though consolidated lung of lobar pneumonia.
3. Percussion is used to determine if the underlying tissues are air or fluid filled or solid. Using the middle finger's distal joint press firmly on the chest keeping the rest of the hand off. Then strike the DIP joint with your other middle finger tip-movement is from the wrist. Normal lung tissue is resonant. The liver sound is dull. The lungs sound dull when fluid replaces air in the lungs as in pneumonia with infiltrate or with hemothorax. Percuss for diaphragmatic excursion, compare the level of the dullness on full expiration and full inspiration, usually moves up and down 5-6 cm.
4. Ausculatation of lung fields: Abnormal breath sounds of the lungs are of two types:
    a. Crackles (old name was rales): are intermittent, non-musical, very brief sounds. They sound like rubbing hair between your fingers. Notice if they are heard on inspiration or expiration. These sounds are produced when previously closed airways open suddenly in the smaller airways.
    b. Continuous or of longer duration then crackles with a musical sound. There are of two types:
        1. Wheezes: High pitched musical sound caused by relatively high velocity air flow through a narrowed airway.
        2. Rhonci: Deeper, have a snoring quality, caused by the passage of through an airway obstructed by secretions. Tend to disappear after coughing.

Now repeat the examination on the anterior chest:

1. Inspect chest
2. Palpation of chest
3. Palpation of tactile fremitus
4. Percussion of anterior thorax
5. Auscultation of anterior chest

The Heart and Blood Vessels

Anatomy: The heart is positioned behind the sternum and is encased inside a sac called the pericardium, which allows for friction free movement of the heart. Within the heart there are four chambers - two atria and two ventricles. The heart receives blood from the body via the superior and inferior vena cava. The heart has four valves - the tricuspid, mitral, pulmonary, and aortic. The coronary arteries supply blood to the heart muscle or myocardium The electrical conduction system controls the pace of the heart The main pace maker of the heart is the SA node. The impulse is carried to the AV node, the Bundle of His, and finally to the Purkinje Fibers causing the heart to contract. In between heats the heart is in a relaxed phase called diastole. Contraction is called systole. The blood pressure reflects these two phases: the systolic pressure is the pressure in the arteries while the heart is contracting, and the diastolic pressure while the heart rests. While listening to the heart two sounds are made as the valves close with contraction The first sound or S l is due to the AV valves closing and the second or S 2 is due to the closing of the pulmonary and aortic valves. Heart murmurs are unexpected sounds due to:

1. Incompetence of the valve with regurgitation or back flow of blood into the heart or
2. Stenosis or narrowing of the opening thorough which the blood must flow.

The cardiac output per minute is equal to how fast the heart is beating and the amount or volume of blood that is pumped out of the heart with each beat. In other words: Cardiac output = Rate x stroke volume. Arteries carry oxygenated blood to the capillaries where the oxygen is exchanged for carbon dioxide. The veins return the deoxygenated blood back to the heart The heart beat can be felt over the larger arteries. Arteries used to check the pulse are the carotid, brachial, radial, femoral, and popliteal

1. Blood Pressure - Check blood pressure in both arms.
2. Inspection - Neck veins for distension or pulsations
    - Check the Precordium for pulsation (the area over the heart)
3. Palpation - Feel for the apical impulse at the apex
    - Palpate the left sternal boarder and the suprasternal notch (where the base of the heart is located).
    - Check Pulses and compare upper and lower extremities
4. Auscultation: the heart is listened to in 5 areas while sitting and lying down
    a. Aortic valve area: second right intercostal space right sternal boarder.
    b. Pulmonic valve area: second left intercostal space left sternal boarder.
    c. Second pulmonic area: third left intercostal space left sternal boarder
    d. Tricuspid valve area: fourth left intercostal space left sternal boarder
    e. Mitral valve area at the apex of the heart, fifth intercostal space, mid clavicular line.

Note: Check rate (speed) and rhythm (regular or not); listen for SI and S2 ("lub-dubb") and any abnormal sounds

5. Check for any edema, or varicose veins.

1. Coronary Artery Disease - CAD: A disorder of the blood vessels that supply the heart muscle (myocardium) with oxygenated blood. It is characterized by arteriosclerosis - (a thickening of the walls of the arterioles with loss of elasticity and contractility) and by arteriosclerosis - (an accumlation of lipids -cholesterol deposited in the arterioles). Sclerosis means hardening, and the arteries become hardened and blocked.
   Risk Factors: age, male gender, hypertension, cigarette smoking, obesity, physical inactivity, diabetes mellitus, and excessive intake of cholesterol and saturated fats. CAD leads to angina pectoris, myocardial infarction and death

   S: Chest - (angina) caused by an insufficient supply of blood to the heart due to narrowed coronary arteries. Provoked by physical exercise, relieved by rest The patient has great anxiety due to a fear of death. Diaphoresis (sweating), and dyspnea.
   O: Elevated blood pressure, arrhythmia's may be present with changes on EKG (ST segment depression) and tachypnea (rapid breathing).
   A: Angina
   P The diagnosis of angina is strongly supported if sublingual nitroglycerin gives relief acts in 1 to 2 minutes. Dosage: one placed under the tongue, may be repeated at 3 to 5 minute intervals. If pain is not relieved after 3 to 4 tablets or the pain lasts more then 20 minutes consider myocardial infarction.
   Refer to MD.

2. Myocardial Infarction (MI): An infarct is an area of the heart that undergoes necrosis (death) following blockage of the blood supply caused by an occlusion of one or more of the coronary arteries.

   S: Severe crushing chest pain radiating into the left shoulder, sweating, nausea, vomiting, shortness of breath, with pain lasting more than 30 minutes. Dizziness, and pallar. Not relieved by nitroglycerin
   O: Anxiety, EKG with ST segment elevation Tachycardia or Bradycardia. Blood pressure elevated, Cardiac enzymes elevated CPK first to rise.
   A: Myocardial Infarction
   P: Medical Emergency MD I PA ASAP!
   Begin oxygen, and IV, continuous cardiac EKG monitoring Pain relief: Morphine sulfate 4-8 mg or
   Meperidine 50-75 mg
   Lidocaine infusion 1-2 mg - used to prevent arrhythmias.

3. Cardiac Arrest: heart functions stop, fatal without treatment Due to lethal arrhythmia's

   S: Unconscious
   O: Apnea (no breathing), cyanosis, no pulse, dilated pupils, no heart beat or blood pressure.
   A: Cardiac Arrest
   P: CPR, ACLS, Defibrillation.

4. Hypertension: High blood pressure has no symptoms until it reaches an advanced stage However if untreated leads to stroke, heart attack or kidney damage. In an adult hypertension is defined as a systolic pressure over 140 mm Hg or a diastolic pressure that is higher than 9OmmHg In most cases the cause is unknown and is referred to as primary or essential hypertension. Risk factors include a positive family history, black, male, smoker, abuse of alcohol, over weight, diet (salt) and stress

   S: Usually no symptoms, may develop dizziness, headache, chest pain, dyspnea, or blurred vision
   O: Elevated blood pressure as measured twice a day for 3-5 days.
   A: Hypertension
   P: Treatment is for life. Diuretics, Beta blockers, ACE inhibitors, etc. Stress reduction, loss of weight, stop smoking, no salt. Refer to medical officer.

5. Varicose Veins: Enlarged, twisted, knotted, superficial veins. Most common in lower legs and due to incompetent venous valves. Aggravated by pregnancy, obesity and prolonged standing.

   S: Dull aching pain and cramping.
   O: Dilated veins beneath the skin in the thigh and leg. Swelling may occur.
   A: Varicose Veins
   P: Rest, elevation, elastic support stockings and surgical treatment to remove incompetent veins.

6. Thrombophlebitis: Inflammation of a vein due to partial or complete occlusion by a thrombus blood clot) usually in a leg. The formation of a blood clot or thrombus is a life saving process when it occurs during hemorrhage. It is a life - threatening event when it occurs at the wrong time because it can occlude and stop the blood supply to an organ. The thrombus, if detached, becomes an embolus and occludes a vessel at a distance from the original site, for example, a clot in the leg may break off and cause a pulmonary embolus.
   A. Superficial venous thrombophlebitis: Occurs spontaneously in a person with varicose veins, in women during and following pregnancy, or taking oral contraceptives, and following trauma.

S: Dull pain in the area of the vein usually the calf or thigh. May be swollen, warm and red.
O: Induration, swelling, tenderness over a vein May be red and feel like a knot.
A: Superficial Thrombophlebitis
P: Local heat, bed rest, keep leg elevated.
Non-steroidal anti-inflammatory drugs like ASA, Motrin, etc Refer to medical Officer

B. Deep venous thrombophlebitis: The urgent nature of this condition stems from the often fatal complication of pulmonary embolus. Commonly involves the deep veins of the calves. Risk increases with oral contraceptives, following surgery, or with varicose veins.

S: Rapid onset of pain and swelling of the limb.
O: Diffuse muscular tenderness on manual compression. Forcible dorsiflexion of the foot causes pain in the calf. Calf and thigh circumferences of the involved extremity at least 2 cm more than the normal leg. Slight fever or Tachycardia.
A: Deep vein thrombophlebiits.
P: Refer to medical officer for hospital admission for anticoagulation using Heparin.

Neurologic System

Clinical Examinations

Anatomy: The brain has four regions: the cerebrum, diencephalon, brain stem, and the cerebellum. The brain and spinal cord are protected by the meninges. Cranial nerves supply the motor and sensory tracts for the head and neck.

The *Cerebrum* interprets sensory input and is concerned with all voluntary muscular activity. It controls consciousness and is the center of memory, reasoning, intelligence and emotions.

The *Cerebellum* is concerned with coordination of voluntary muscular movement making it possible to walk or touch your nose with a finger.

The *Diencephalon* or the thalamus is a relay center of all sensory input from the body to the cerebrum. It activates or arouses the brain to consciousness. Example: You are asleep, the fire alarm goes off -sensory input hits the thalamus - it then activates the brain (turns on the computer) to action. If this area is injured, coma can result.

The *Brain Stem* connects the brain to the spinal cord. The cranial nerves branch off of it. Vital areas for the control of heart rate, blood pressure and respiration are found in the part of the midbrain called the medulla. The medulla is located above the first vertebrae. With swelling or bleeding in the skull pressure pushes the medulla down, damaging it against the vertebrae causing death due to loss of control to the heart, lungs and blood pressure. First signs of this problem are noticed in the cranial nerves - this is the reason they are checked following head injury.

Meninges are the fibrous and vascular coverings of the brain & spinal cord. If the skull is hit, the bone protects the brain from direct injury. But indirect injury can result if the brain is bounced against the hard bony inner surface of the skull. In between the skull and the brain are the meninges. This 'PAD' (**P**ia mater, **A**rachnoid, & **D**ura mater) protects the brain. The *pia mater* is a thin sheet that hugs the brain.

The *arachnoid* is the middle layer and is separated from the pia mater by the subarachnoid space, which is filled with cerebrospinal fluid. Cerebrospinal fluid acts to cushion the soft cranial and spinal cord tissue within their hard bony protective cases.

The *dura mater* is the tough fibrous sheath; it covers the arachnoid and lies against the skull. While the meninges protect the brain they can also be damaged and if bleeding occurs pressure can be exerted against the brain stem.

The 12 *Cranial Nerves* are motor, sensory or both. Knowing the function of each cranial nerve and how to examine them helps to identify the location of lesions in the brain and brain stem. The 12 cranial nerves and their functions must be memorized.

CN	Name	Function	M/S/B
I			
II			
III			
IV			
V			
VI			
VII			
VIII			
IX			
X			
XI			
XII			

THE NEUROLOGIC EXAMINATION:

ORIENTATION:
Person, Place & Time
CRANIAL NERVES
CNII-XII intact or report deficiencies
SENSORY
Dermatomes are areas of sensation and autonomic function in the skin which are served by CN V and specific nerve roots which comes off each of the vertebrae. The area of skin supplied by each nerve forms a band that can be mapped out on the skin. It is possible to localize the level of damage in the spinal cord and brain stem with the aid of a dermatome map. The types of sensation are *Pinprick* (present, absent or increased/decreased with respect to other normal side), *Light Touch* (present or absent), *Proprioception*/*Vibratory sense* (present or absent), and *2 Point Discrimination* (reported in mm. NORMAL is 5mm at finger tips).
MOTOR
Muscles are graded from five to zero and are reported as a number over the maximum possible ie 5/5 or 1/5. A "+" or "-" is added to denote slight differences the grades below.

Normal	+5/5
Incompletely resists Examiner	4/5
Moves joint through a Range Of Motion against gravity	3/5
Moves joint through a Range Of Motion w/gravity removed	2/5
Muscle contracts but, no joint movement is achieved	1/5
No Movement	0/5

Shoulder Abduction, C5
Elbow Flexion, C5,6
Wrist Extensors, C6
Wrist Flexors, C7
Finger Extensors, C7
Finger Flexors, C8
Finger Abductors, T1
Hip Flexors, T12-L3
Hip Adductors L2-L4
Hip Abductors, L4-S1
Knee Extensors, L2-L4
Foot Inversion, L4
Toe Extensors, L5
Foot Eversion, S1
Foot Plantarflexion, L5-S2

DTR'S
Deep tendon reflexes are used to evaluate the sensory and motor units of a particular spinal cord level. Reported as a fraction of the maximum (4). NORMAL is 2/4, ABSENT is 0/4 and HYPER-REFLEXIA is 4/4.
Biceps, C5
Brachioradialis, C6
Triceps, C7
Patellar, L4
Achilles, S1

CEREBELLAR FUNCITON
Gait/Posture
Note the patient's type of gait and ability to maintain their posture while sitting and or standing.

Finger-Nose Test:
The test begins with the patient's upper arms in a horizontal plane with the elbows in full extension and eyes closed. The patient is instructed to alternately touch their index fingers to their nose. The sequence may be performed at varying rates and horizontal starting positions.

Nose-Finger-Nose Test:
The patient is instructed to alternately touch the tip of their index finger to the tip of their nose and the tip of the examiner's finger. The examiner moves his/her finger about during several sequences. The examiner should ensure full extension of the patient's elbow during this test.

Rapid Alternating Movements:
Pat knees alternating palms and the back of hands or touch fingers to the thumb rapidly

Romberg test:
Ask the patient to stand, feet together with arms at their sides, first with their eyes open then closed. Loss of balance indicates a cerebellar problem and is a positive Romberg sign.

OTHER TESTS
Babinski:
Using a pointed object stroke the plantar side of the foot from the heel to the ball of the foot. Dorsiflexion of the great toe, fanning of the toes or both dorsiflexion of the great toe and fanning of the toes constitutes a positive Babinski, ie loss of brain inhibition of a spinal reflex.
Pronator Drift:
With the patient in the Romberg's position have the patient raise their arms in front of them palms up. Note whether the supinated hands slowly pronate once the eyes are close. If only one hand pronates an intra cranial lesion is possible.

Head
Tension Headaches:
The most common type of headache, usually the result of involuntary muscle contraction of the head, neck or shoulder. Occurs daily and is associated with depression, anxiety, tension or fatigue. Headaches that are worse on arising in the AM are usually related to depression. They may persist for days, weeks, or months.
S: Dull persistent headache that circles the head in a "hat band" & "feels like a tight band around my head." May be alternatively located in the occiput.
O: Normal neurologic examination. May have TTP over the Occiput, Neck and/or

Shoulder muscles.
A: Tension HA
P: Tylenol (Acetaminophen) 325 mg, 2 TAB PO Q4 D#24
FFD, f/u PRN
If depressed, refer to Physician.

Migraine Headaches:
S: Periodic, throbbing, severe, frequently unilateral, pain maybe triggered by specific foods (chocolate), EtOH, menstruation, oral contraceptives, stress or fatigue. Associated with nausea, vomiting, photophobia and sensitivity to sound. Classic migraines are preceded by a visual prodrome such as flashing lights, blind spots, or hemianopsia. Common migraines don't have a prodrome. Relieved by sleep.
O: Normal neurologic examination.
A: Migraine HA
P: Refer to physician.

Cluster Headaches:
S: Severe unilateral periocular, throbbing pain occurs at the same time every day lasting from minutes to a few hours. They come in clusters and last weeks to months and then subside. ϕ Relief with sleep. Usually Γ.
O: Autonomic dysfunction, miotic pupil, ptosis, red eye, and/or Uni-lateral nasal congestion
A: Cluster HA
P: Refer to physician.

Meningitis/Encephalitis:
S: Unrelenting HA, stiff neck, backache, fever, nausea, vomiting or irritability and confusion.
O: Fever, nuchal rigidity, Brudzinski's sign (attempt to flex the neck results in reflex flexion of the knee and hip), Kerning's sign (with thigh flexed on the abdomen patient resists knee extension $<135^{o}$). Increased WBC. Mental status change (confusion to coma), seizures, focal neurologic signs such as paralysis indicate encephalitis.
A: Meningitis or Encephalitis
P: Immediate Referral to physician.

Seizures
S: Altered level of consciousness, postictal confusion or fatigue, paresis, H/O seizures or head trauma
O:
A:
P: Protect the Patient
Immediate referral to physician.

Closed Head Trauma:
S: HA and/or painful scalp/face. ϕ LOC, neurologic signs or neck pain. H/O blunt trauma.
O: TTP w/o bone pain or step off, Soft tissue swelling, ecchymosis, normal ocular, jaw and neck ROM. Normal neurologic exam including mental status.
A: Closed Head Trauma or Facial Contusion
P: LLD x 2 days, f/u PRN
Tylenol (Acetaminophen) 325 mg, 2 TAB PO Q4 D#24
Head trauma education/sheet
Immediate Referral to physician if FX, LOC or abnormal ROM or neurologic signs/exam

Open Head Trauma:
S: HA, painful scalp and/or face/neck pain,
O: Laceration, hemorrhage or bony step off
A: Open head trauma
P: Control hemorrhage
Immediate referral to physician.

Facial Laceration:
S: Sharp or blunt trauma with resultant pain.
O: Laceration, hemorrhage or bony step off
A: Facial Laceration
P: Control hemorrhage

Immediate referral to physician.
Eyes
Blepharitis:
Hordeolum (stye):
Chalazion:
Conjunctivitis:
Corneal Abrasions:
Burns:
Retinal Detachment:
Glaucoma:
Iritis:

Ears
Otitis Externa:
Otitis Media:
Serous Otitis Media:

Nose
Rhinitis:
Sinusitis:

Nasal Fracture:
Epistaxis:

Throat
Pharyngitis:
Peritonsillar Abscess (PTA):

Neck
Fracture:
Cervical Sprain/Strain:
Hyperthyroidism:
Hypothyroidism:
Lymphadenopathy:

Chest Wall
Rib Fracture:
Flail Chest:
Chostochondritis:
Strained Muscle:

Lungs
Asthma:
Bronchitis:
Pneumonia:
Simple Pneumothorax:
Open Pneumothorax:
Tension Pneumothorax:
Hemothorax:

Cardiovascular
Hypertension:
Angina Pectoris:
Myocardial Infarction:
Varicose Veins:
Superficial Venous thrombophlebitis:
Deep Venous Thrombophlebitis:

Gastrointestinal & Abdomen
Umbilical Hernia:
Abdominal Strain:
Gastroesophageal Reflux:
Ulcer:
Gastritis:
Gastroenteritis:

Enteritis:
Hepatitis:
Pancreatitis:
Cholelithiasis:
Appendicitis:
Constipation:

Rectum
Internal Hemorrhoids:
External Hemorrhoids:
Anal Fissure:
Perirectal Abscess:

Genital Urinary System
Urolithiasis:
Pyelonephritis:
Cystitis:
Prostatitis:
Epididymitis:
Urethritis:
Inguinal Hernia:
Hydrocele, Spermatocele, Varicocele:
Testicular CA:
Cryptorchidism:

Back
Fracture:
Thoracic or Lumbar Sprain/Strain:
Radiculitis:
Cauda Equina Syndrome:

Extremities
Fractures:
Dislocations:
Tendonitis:
Sprain/Strain:
Compartment Syndrome:
Osgood Schlatter's Disease:
Patellar — Femoral Syndrome:
Acute Arthritis:
Dorsal Wrist Ganglion:
Subungual Hematoma:
Paronychia:

Skin
Urticaria:
Acne:
Folliculitis, Furuncle, Carbuncle:
Abscess:
Impetigo:
Cellulitis:
Pityriasis Rosea:
Psoriasis:
Tinea pedis:
Tinea cruris:
Tinea versicolor:
Eczema:
Seborrhea:
Atopic Dermatitis:
Scabies:
Verrucae:
Pediculosis pubis:
Skin CA:

Gastrointestinal System

Anatomy: The GI tract functions to provide the body with water, electrolytes, and nutrients. Food is moved through the system while digestive enzymes that break down the food are secreted. The esophagus moves food from the pharynx to the stomach by successive, synchronized contractions. The stomach is found between the esophagus and the duodenum and is shaped like a "J". The food is stored here while hydrochloric acid is secreted and mixed with the food, beginning the digestive process. The partially digested food (called chyme) is pushed into the duodenum through the pyloric sphincter. It is at the beginning of the duodenum that secretions from the pancreas and liver enter via the common bile duct. The liver produces bile that is stored in the gall bladder and released as needed for digestion. The pancreas is located below the stomach and secrets important digestive enzymes. As the food (chyme) moves through the small bowel (jejunum and ileum) nutrient absorption occurs. The large intestine or colon is where water and electrolytes (sodium, potassium, chloride, and bicarbonates) are absorbed. Undigested material (feces) moves to the rectum where the feces are stored until evacuated.

Abdominal examination:
The abdomen is often divided into four quadrants by imaginary lines crossing at the umbilicus — the RUQ, LUQ, RLQ, and LLQ, (right & left upper and right & left lower quadrants). Three other terms are commonly used — the epigastric, umbilical, and suprapubic regions.

1. Inspection: check for scars, rashes, dilated veins, umbilical hernia or distention.
2. Auscultation: Listen in all four quadrants. An arterial bruit (a vascular murmur like sound) may be heard. Bowel sounds may be present, hyperactive, or absent. If no sounds are heard in five minutes consider them absent.
3. Percussion: Begin percussing the liver down from the right upper chest. Liver dullness begins around the 5^{th} or 6^{th} rib extending down to the costal (rib) margin. Liver length is usually less than 15 cm.
4. Palpation: Feel both superficially (lightly) and deeper in all quadrants with the patients knees bent to relax the abdominal wall.
   RUQ: Feel for the liver during inspiration, usually not felt but may be felt in a slender person. If enlarged you will feel the edge of the liver as it passes beneath the fingers.
   LUQ: feel for the spleen on inspiration, usually not palpable.
   RLQ and LLQ: Check 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 heel tap and pelvic shake.
5. Abdominal Reflex: The abdominal skin is stroked in each of the quadrants. The umbilicus should twitch towards the quadrant, which was stroked.
6. 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 and obtain a stool specimen for blood and test using the hemacult test.

7. The Routine Abdominal Examination:
    a. Inspect abdomen
    b. Ausculate all four quadrants
    c. Percuss out liver size
    d. Palpate for enlarged liver
    e. Rectal examination for blood in stool.

GASTROINTESTINAL AND ABDOMINAL PROBLEMS

1. Esophageal Reflux: After food has entered the stomach, if the lower esophageal sphincter fails to close adequately. The stomach contents mixed with hydrochloric acid backs up (reflux) into the lower esophagus causing pain and heartburn.
   S: Heartburn, burping, regurgitation — worse with lying down, frequently severe substernal pain, occurring 30 — 60 minutes after eating.
   O: The physical exam is usually normal. Stool should be checked for occult blood with rectal exam.
   A: Esophageal Reflux.
   P: Weight reduction if obese, avoid eating near bedtime, Antacids after meals and at bedtime, avoid cigarettes, alcohol, coffee, and tight belts. Elevation of the head of the bed with 6 inch blocks also helps.
2. Gastroenteritis: An acute syndrome characterized by inflammation of the stomach and intestinal tract. Usually caused by a viral organism.
   S: Nausea, vomiting and diarrhea. Fever headache and abdominal cramps.
   O: Fever under 102 F. Minimal abdominal tenderness. Normal to increased bowel sounds. Dehydrated with orthostatic hypotension "positive tilts" (the blood pressure falls when moving to a standing position)
   A: Gastroenteritis
   P: Rest, clear liquid diet for 24 hours, and no milk. Correct fluid loss orally or with IV's. If vomiting is severe, control with: Tigan 250 mg q 6 hrs
   Tigan injection 250 mg IM
   If not improved in 24 hours or if accompanied by high fever and severe diarrhea refer to MO/PA.
3. Ulcer Disease: Ulceration of the lining of the stomach or duodenum as a result of hyperacidity. Precipitated by stress, diet — alcohol and coffee, drugs —ASA etc., infection, with heredity playing a role also.
   S: Epigastric distress 45 — 60 minutes after meals. Pain is frequently burning or gnawing in quality, and may be nocturnal — becoming most severe between midnight and 0200 hrs. Pain is relieved by food or antacids.
   O: Epigastric tenderness, occult blood on rectal exam if the ulcer is bleeding. UGI or endoscopy confirms the diagnosis.
   A: Ulcer Disease
   P: Restriction of coffee, tea, cola, alcohol and cigarettes.

Antacids: 30 ml po 1 and 3 hours after meals and at hs
Cimetidine (Tagamet) 400 mg po BID or 800 mg po at Hs.
Refer to MO/PA.

4. Constipation: Considered if defecation is delayed for days beyond the patients normal, or if the stools are unusually harzd, dry, and difficult to move.

   S: Constipation, occasionally with abdominal distention or cramps. Usually no severe pain, nausea, vomiting or blood in stools.
   O: Minimal abdominal tenderness, usually LLQ, normal bowel sounds, may be able to palpate stool in colon. No blood on rectal exam.
   A: Constipation.
   P: Diet: increase intake of water and fiber (fruits, bulky vegetables, and bran cereals).
   Establish a time for defecation: 15 — 20 minutes following breakfast provides a good time because spontaneous colonic motility is greatest at this time.
   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

5. Diarrhea: Frequent passage of unformed watery bowel movements. May be due to viral, bacterial or parasitic infections. With simple diarrhea no blood, pus, or fever is present.

   S: Frequent loose or watery stools, mild crampy abdominal pain prior to bowel movement
   O: Fever is usually absent, generalized abdominal tenderness, hyperactive bowel sounds, no rebound or localized findings and no blood on rectal exam.
   A: Simple diarrhea.
   P: Withhold food for 24 hrs — clear liquid diet only. No milk for 3 days.
   Kaopectate liquid: 2 tbs. after each loose bowel movement (or 2 tbs.).
   Refer to MO/PA if not improved.

6. Hemorrhoids: A mass of dialated, tortuous veins (varies) in the anal area involving the venous network (Plexus) of the area. Caused by straining at stool, constipation prolonged sitting and a diet poor in fiber.

   S: Itching, irritation and bleeding with bowel movements.
   O: Obvious external hemorrhoid or internal hemorrhoids found on rectal examination.
   A: Hemorrhoids
   P: High roughage/ fiber diet. Sitz bath (sitting in warm water reduces pain and

swelling)
Metamucil 2 tsp. in water 2-3 x qd
Hydrocortisone cream 1%, 2-3 x qd
Anusol or Anusol HC suppositories for internal hemorrhoids given tid.
Note: A thrombosed external hemorrhoid is caused by rupture of a vein, forming a clot in the subcutaneous tissue. A tender, bluish mass is seen. If discomfort is severe and the patient is seen in the 1st 24 hrs, removal of the clot is indicated for pain relief. After 24-48 hrs, hot sitz baths are used.
Refer to MO/PA as indicated.

7. Cholelithiasis (Gall Stones): Formation of calculi or bile stones in the gallbladder.

   S: Nausea, vomiting, abdominal pain RUQ, and fever
   O: RUQ tenderness, rebound pain, may have jaundice.
   A: Gall Stones.
   P: Refer to MO/ PA

8. Acute Abdomen: An abnormal condition of the abdomen in which there is sudden onset of severe pain. It requires immediate evaluation and often immediate surgical intervention.

   S: Abdominal pain:

   a. APPENDICITIS — mild pain gradually increasing usually signifies an infectious process.
   b. PERFERATION — sudden severe pain
   c. OBSTRUCTION — severe pain coming in waves.

   All may have nausea, vomiting, and anorexia.

   O: Location of abdominal tenderness is important in diagnosis of the problem (see diagram).
   Appendicitis: Right lower quadrant
   Perforated Ulcer: Epigastric pain radiating to the
   Back Cholecystitis: RUQ pain radiating to shoulder or back
   Kidney Stone: Flank pain radiating into the groin
   May also have associated fever and elevated lab values.
   A: Acute Abdomen
   P: Refer to MO/PA

9. Appendicitis: The most frequent cause of acute abdomen.

   S: Initially anorexia and pain in the epigastric or periumbilical area of the abdomen. Nausea, diarrhea, and vomiting " may" accompany pain. The pain is

moderately severe and after several hours moves to the RLQ and becomes sharper. Fever may be present.
O: Fever if present usually below 101 F. Tenderness in epigastric area, but classically localized to the RLQ. Pain in the RLQ will increase on straight leg raising, or jarring of the right leg with heeltap (positive psoas sign). The actions indicate peritoneal inflammation.

Lab Studies: WBC count is elevated with an increase in polymorphonuclear leukocytes
U/A is normal,
if positive for blood consider kidney stone
if positive for pyuria (TNTC WBC'c = Pus) consider pyelonephritis
A: Appendicitis
P: Nothing by mouth except occasional sips of ice water.
Refer to MO/PA

Genitourinary System

Anatomy

The urinary system consists of the kidneys, ureters, bladder, and urethra. The two kidneys are located on either side of the vertebral column just above the waistline. The kidneys filter out waste products along with excess fluid and electrolytes. Urine is formed within the nephron (each kidney has one million nephrons). Nephrons provide a cup shaped receptacle called the Bowman's capsule in which a group of capillaries are inserted. This tuft of capillaries is called a glomerulus. As blood flows into the glomerular capillaries wastes, water, and electrolytes are filtered out of them and into the cup or Bowman's capsule and into a collecting tubule where reabsorption of water and electrolytes occurs. Urine passes through the tubule to the pelvis of the kidney into the ureters and finally to the urinary bladder. The urine is stored in the bladder until urination occurs passing it out through the urethra.

The male genital system consists of the penis, testicles, epididymidis, scrotum, prostate gland, and the seminal vesicles. The penis is discussed in detail in the STD session. The scrotum contains the testicles, which produce sperm. A lower temperature is needed than the body can provide; therefore the testicles are suspended outside the body. The epididymis is a soft comma shaped structure located on the posterolateral aspect of each testicle, providing storage until the sperm enter the vasdeferens, the tube that carries the sperm to the seminal vesicles and to the urethra via the prostate gland. The prostate gland resembles a large chestnut and surrounds the urethra just under the bladder. It produces the majority of the ejaculatory fluid that carries the sperm.

Physical examination

Kidney: Inspect the flank for bruising or swelling
Assess each kidney for tenderness. Have the patient sit, then place the palm of your hand over the costovertebral angle (CVA) and strike your hand with the ulnar surface of the fist of your other hand. Direct percussion with the fist over the CVA is also acceptable. The test should not cause any tenderness. If there is tenderness it can be indicated as CVAT (costo Vertebral Angle Tenderness).
Palpation: This is attempted by elevating the flank with one hand while palpating deeply with the other. Normally the kidneys are not palpable.

Bladder: Inspect the lower abdomen (suprapubic area). Look for enlargement or distention. Palpate for tenderness or rigidity.

Male Genitalia Examination

The Penis: Note if circumcised, if not is the foreskin easy to retract, check the external meatus of the urethra, note any discharge. Palpate the shaft for tenderness or lesions.

The Scrotum: The left testicle / scrotum usually hangs lower. Sebaceous cysts are a common lump found on the skin.
Check for hernia: With the patient standing inspect the area of the inguinal canal while he bears down or strains as if having a bowel movement. After inspecting, insert a finger into the lower scrotum. Ask patient to cough. If a hernia is present, you should feel intestine push against your finger.
The testes: Check by palpating using the thumb and first two fingers. They should feel smooth, rubbery, but free of nodules. Irregularities in texture or size may indicate cyst or tumor.
The epididymis: should be smooth, discrete, and non-tender.

History of the Genitourinary Patient

1. Five Major Symptoms:
    a. Urgency: a strong desire to urinate due to inflammation to the bladder, prostate, or urethra. May be caused by bacterial infection or chronic prostatitis.
    b. Frequency: shorter duration between urination, frequent repetitions, w/o increased fluid intake.
    c. Dysuria: Burning or pain with urination, difficulty voiding.
    d. Nocturia: Voiding at night, associated with anything that causes frequency.
    e. Hematuria: Blood in the urine is considered a serious sign.
    Painless hematuria is a malignancy until proven otherwise. Seen with tumors, infections, trauma and TB.
    Painful hematuria due to infection or stones.
    Hematuria always needs investigation and follow-up by Urology.
2. Related Symptoms:
    a. Enuresis: involuntary voiding during sleep.
    b. Incontinence: inability of the bladder to retain urine.
    c. Proteinuria: (albuminuria) is seen in all forms of renal disease.

Genitourinary Problems

1. Cystitis: Inflammation of the bladder due to ascending urinary tract infection.

    S: Frequency, burning, and urgency of urination. Occasionally hematuria and /or incontinence.
    O: Suprapubic tenderness, no fever, CVA tenderness or discharge abdominal and genital exam. U/A shows WBC's, RBC's and usually a positive nitrite. Always get a urine culture.
    A: Cystitis (UTI)
    P: Refer to MO or PA
    Antibiotics: Septra DS, 1 po BID for 10 days, or

Amoxicillin 250 mg 1 po TID for 10 days.
Pain Medication:
Pyridium (phenazopyridine HCL) 100-200 mg po TID. May color urine red or orange —inform patient
Note: Repeat urine in 10 days and again in 2-3 wks after tx. If a male patient is diagnosed with a UTI, a Urology Consult is mandatory! An STD must be ruled out prior to tx.

2. Acute Pyelonephritis: An inflammation of the renal pelvis, tubules and intersitial tissue (pertaining to the tissue within an organ) of one or both kidneys. May be caused by bacteria (E. Coli. in 25% of cases). Other major causes include obstructions and reflux conditions, stones, congenital abnormalities, and diabetes.

   S: Urgency, frequency, dysuria, fever, chills, severe flank pain, nausea, vomiting, hematuria, and headache.
   O: CVA (flank) tenderness may be severe. Elevated temp (101-106 F). Normal abdominal exam. U/A: WBC and RBC (TNTC) to numerous to count, casts, bacteria 4+.
   CBC: WBC's 15-30,000
   A: Pyelonephritis.
   P: Refer to MO or PA. Usually requires IV. Antibiotics and hospital admission.

3. Kidney Stones (Renal Calculi or Urolithiasis): Formation of stones within the urinary tract as a result or a metabolic imbalance. Too much calcium, uric acid, or oxalate. (May be caused by high intake of tea, cocoa, spinach, beets, rhubarb, and nuts.)

   S: Unable to find a comfortable position, severe (colicky) flank pain, groin or testicular pain, hematuria — microscopic or gross in nature, urgency, frequency and dysuria in the absence of infection.
   O: CVA and flank tenderness, pain may radiate to groin hematuria on U/A, mild shock may be present. An IVP or KUB (X-ray) may show the obstructing stone.
   A: Renal Calculi (Kidney Stones)
   P: Refer to MO or PA
   Relieve pain with morphine or Demerol.
   Force fluids, strain urine for stone. May need hospital admission.

4. Prostatitis: An acute or chronic inflammation of the prostate as a result of infection. May be accompanied by epididymidis, cystitis, or gonococcal infection.

   S: Perineal pain (perineum refers to the area between the scrotum and anus), fever, dysuria, frequency, and urethral discharge.
   O: Enlarged, tender, boggy prostate on rectal exam. May have tender epididymis and urethral discharge. U/A shows elevated WBC's

A: Prostatitis.
P: Refer to MO or PA. STD work up prior to treatment.
Antibiotic: Septra DS 1 po BID for 14 days
Rest; increase fluid intake, analgesics, and stool softeners are used in treatment. Hospitalization and Urology Consultation may be required.

5. Epididymitis: Inflammation of the epididymis as a result of trauma, infection or chemical irritation. May be complication of gonorrhea or prostatitis. Chemical irritation is due to reflux of urine when exercising or being sexually active with a full bladder. Secondary orchitis (inflammation of the testes) with a swollen, painful testicle may occur.

   S: Scrotal pain, tenderness, and scrotal enlargement.
   O: Tenderness and swelling of the epididymis and the spermatic cord may include the testes. Associated with a fever and chills if the cause is bacterial.
   A: Epididymitis.
   P: Refer to MO or PA. Bed rest, elevation and support of the scrotum provide symptomatic relief.
   Analgesic: Motrin 600 — 800 mg po TID with food
   Antibiotics: For patients under 35 years of age-
   Vibramycin 100 mg 1 po BID for 10 days or
   Tetracycline 500 mg po QID for 10 days or
   Erythromycin 500 mg po QID for 10 days.
   If over 35: Septra DS 1 po BID for 10 days.

6. Inguinal Hernia: A protrusion of the small bowel through the abdominal wall into the inguinal canal or scrotum.

   S: Groin pain, swelling, may have the sensation of something tearing in the lower abdomen while lifting or doing heavy exercising. Swelling worsens with standing and reduces while lying down.
   O: Palpable mass in the inguinal canal or scrotum, easier to feel when patient bears down or coughs. Tender with palpation. May or may not reduce with the patient in the supine position and while applying gentle pressure.
   A: Inguinal Hernia
   P: Refer to MO or PA
   If non-reducible or extremely painful, refer to surgeon ASAP.
   Otherwise, rest and routine referral to surgery are indicated.

7. Hydrocele, Spermatocele, Varicocele: All three are disorders found in the scrotum. "Cele" is a suffix indicating a swelling or tumor.
   Hydrocele: Common in newborn males. The accumulation of serous fluid from the abdomen in the testicular sac via a connection from the peritoneum to the scrotum. Usually not painful may need surgery to correct the problem.

Spermatocele: A cystic tumor of the epididymis containing spermatozoa. Non-tender, no treatment needed. Usually found on self-exam of the scrotum.

An enlargement of the veins of the spermatic cord known as the pampiniform plexus. Commonly occurs on the left side. Seldom requires treatment. The swelling feels like a bag of worms, and appears bluish through the skin of the scrotum. Due to the heat the veins deliver to scrotum, there may be a problem with the development of sperm and subsequently with fertility. Rarely a feeling of constant pulling or dragging with mild dull pain in the scrotum.

8. Torsion of the Testicles: Normally the testicle is attached to the epididymis above and to the scrotal sac below limiting the movement of the testicle. With testicular torsion the testicle in not attached and is free to twist around. The result is loss of blood flow to the testicle. If not resolved within six hours, it may result in testicular necrosis (death). **This is an emergency!**

   S: Sudden severe unabating pain in the testicle, scrotum, groin or lower abdomen, usually associated with nausea and vomiting.
   O: The testicle is usually extremely tender and difficult to examine, often riding higher then the other testicle and may be swollen and red. Supporting the testicle does not relieve the pain as it does with Epididymitis.
   A: Torsion of the Testicle
   P: Refer to MO or PA. This is a surgical emergency! **Do not delay action!**

9. Testicle Cancer: This is the most common cancer in males between the age of 15-34 years of age, and the leading killer in this age group with regard to cancer. Rapidly spreads (metastasis) to form tumors in the lungs, liver, and brain. It is very malignant and is considered an emergency that requires immediate evaluation by Urology or Surgery!

   S: Testicle swelling. Heaviness in the scrotum due to the density of the tumor, a lump or hard ball may be found.
   O: A hard, painless mass in the testicle. The tumor does not transilluminate, while a hydrocele will.
   Gynecomastia (enlargement of the breast) may be present.
   A: Testicle Cancer.
   P: Refer ASAP to Urology! All men ages 15-34 should be taught TSE (Testicle Self-Exam).

10. Cryptochidisim: (Crypt means hidden) This refers to a hidden undescended testicle. Surgery is indicated by age 2 to 5 if not descended. There is a 10 to 40 fold increase in cancer if not corrected.

DIFFERENTIAL DIAGNOSIS OF PAIN IN THE SCROTUM

	Epididymitis	Tumor	Torsion
Pain:	Common	Absent or mild	Severe
Onset:	Rapid	Gradal	Sudden/Dramatic
Urinary tract Infection	Common	No	No
Palpation of Testicle:	Normal	Mass	Usually Individual
Structures of the Scrotum: Can not be felt separately			
Epididymis	Tender	Normal	
Spermatic Cord	Thickened	Normal	

Sexually Transmitted Disease

Anatomy of the Male Genitalia

At the end of the Penis is the cone shaped glans with its expanded base or corona. The glans is covered by the loose, hoodlike fold of skin called the prepuce or foreskin which is removed with circumcision. Located at the tip of the glans is the slitlike urethral meatus.
The Scrotum contains the testicles. The left usually lies somewhat lower than the right. The epididymis is found on the back side surface of each testicle. It is softer than the testis and comma shaped. The cordlike vas deferens begins at the end of the epididymis, leaves the scrotum through the external inguinal ring as it goes on into the abdomen and to the pelvis/ behind the bladder the vas deferens is joined by the seminal vesicle and enters the urethra within the prostate. Within the scrotum each vas is joined with the blood vessels, and nerves that make up the spermatic cord.
Lymphatics from the penis and scrotum drain into the inguinal nodes. If you find an inflammatory lesion on the penis or scrotum examine the inguinal nodes for enlargement or tenderness.

Physical Examination

Examine the patient standing, underwear should be out of the way-expose the genitalia and inguinal area completely-and wears gloves.

The Penis: Check the foreskin if present, retract it, this is essential for detection of chancres. A cheesy, whitish material called smegma may accumulate normally under the foreskin. A phimosis is a tight foreskin that can not be retracted over the glans. If a tight foreskin gets stuck behind the glans edema results as does difficulty urinating. Check the glans for any ulcers, nodules, or inflammation. Check the base of the penis for excoriations, inflammation, nits or lice at the bases of the pubic hairs. Note the location of the urethral meatus. Hypospadius is a congenital displacement of the meatus on the penis. Inspect the opening of the urethral meatus for discharge. (GC causes a profuse yellow discharge, while NGU causes a scanty and clear discharge). If the patient reported a discharge but none is visible, strip or milk the shaft of the penis-if a discharge presents have a glass slide and culture materials ready.

The Scrotum: Check the skin for rashes or sebaceous cysts. Palpate each testis and epididymis for swelling, lumps, or veins. Remember to teach the patient how to check for testicular cancer as presented in the genital urinary lesson.

Sexually Transmitted Diseases:

1. Gonorrhea: One of the most common and easily spread of all STD's caused by the gonococcus bacteria. Usually infecting the urethra, cervix, occasionally the

rectum, throat, or eyes. The incubation period is from 2 to 14 days. Warning: Venereal diseases in women often have no symptoms.

S: Tingling sensation or burning with urination; purulent discharge or "drip" from the penis, the urethral meatus may be red and edematous or itch; frequency and urgency of urination may be present.
O: A mucopurulent (mucus and pus) urethral discharge. Gram stain of discharge is positive for gram negative diplococci occurring both intracellularly and extracellularly (both inside and outside of the WBC's)
A: Gonorrhea Note: Confirmed by positive culture of urine and discharge from urethra. May co-exist with epididmitis or prostatis.
P: Ceftriaxone: 250mg IM (for the GC) and Doxycycline 100mg BID for 10 days (for NGU).

Note: Generally patients are treated for Chlamydial infection at the same time because of the hand in hand relationship of the two STD's. 2. 5% of men are asymptomatic with the danger of developing G.C. arthritis. It may even spread through the blood to any joint, tendons, meninges, and endocardium.

2. Non-Gonococcal Urethritis (NGU): Infection of the urethra or cervix by chlamydia. Incubation is 1 to 3 weeks.

S: Mild dysuria with frequency, a thin mucopurulent discharge that is worse in the A.M., irritation to the meatus.
O: Discharge with gram stain negative for gonorrhea, showing large numbers of WBCs but no organisms noted. Chlamydia test is positive.
A: Non-Gonorrheal Urethritis
P: Doxycycline 100mg BID for 10 days or
Erythromycin 500mg QID for 10 days or
Tetracycline 500mg QID for 10 days
Increase fluid intake, avoid alcoholic beverages. Recurrent NGU due to lack of compliance with medication or re-infection.

3. Syphilis: Caused by the spiral/corkscrew shaped bacteria called treponema pallidium. The disease begins locally but rapidly invades the body affecting any tissue or organ via the blood and lymph systems. Untreated may lead to death.

S: Stages of Syphillis and Associated Symptoms:

a. Primary Syphillis: Starts with a painless sore/chancre on the sex organs, anus, fingers, lips or tongue from 10 to 30 days after contact. This heals spontaneously. Note: The spirochete can also be identified when a sample scraped from the chancre is examined under a darkfield microscope. If untreated the next stage develops.

Secondary Syphillis: A flulike illness may develop 6 to 12 weeks after the chancre, a generalized non-pruritic rash which may affect the palms and soles. Aches, sore throat, hair loss, and enlarged lymph nodes may be present. This also resolves without treatment.

b. Latent (Hidden) Syphillis: No physical signs-may last from months to a lifetime.
c. Late (Tertiary) Syphillis: Develops 3 to 4 years or more later with tumors of the skin, bones, liver, aortic insufficiency, aneurysms, CNS disorders with widespread damage leading to dementia or psychosis.,

O: Positive darkfield examination. Positive VDRL and RPR. Positive FTA-ABS test (fluorescent treponemal antibody absorption).
A: Syphilis
P: If less than a year: Penicillin G benzathene 2.4 MU IM, or Tetracycline 500mg QID for 14 days.
If more than a year: Penicillin G benzathene 2.4 MU IM 3 times at 7 day intervals.

4. Genital Herpes: Caused by the Herpes Simplex Type II virus, this disease is chronic and recurring with no cure. Active reinfection of the genital area is dangerous to the delivering mother and her baby. A caesarian delivery may be required to protect the baby from the life threatening complications of herpes.

S: Painful, small blisters, on the penis, genital area, groin, rectum. May be preceded by a tingling or burning sensation.
O: Vesicular lesions on an erythematous base, fever, lymphadenopathy, and dysuria. Positive Tzank Smear or positive culture.
A: Genital Herpes
P: No sexual intercourse until blisters or sores are healed over!
Warm compression several times a day may relieve inflammation and pain.
If initial infection: Acyclovir (Zovirax) 200mg 5 times a day for 7 to 10 days.
If recurrent: At first sign of herpes begin Acyclovir 200mg 5 times a day for 5 days

5. Venereal Warts (Condylomata Acuminata):

S: and O: Warts appear as firm papules found on the head, foreskin, or shaft of the penis, on the scrotum or rectum and in the urethra, 1 to 3 months after contact. At times the warts look like cauliflower or are flat. They are caused by the human papillonma virus (HPV) and are non-tender.

A: Condyloma
P:

1. Podophyllin applied to the wart only, wash off in 4 to 6 hours. (absorbed by the wart, destroying it from the inside out)
2. Cryotherapy: freezes the wart with liquid nitrogen
3. Electrosurgery: burns them off with electrical heat

6. Molluscum Contagioscum: Caused by a poxvirus that infects epidermal cells. The lesions are small, dome-shaped papules that are not often umbilicated. When in doubt, the diagnosis may be confirmed by expressing the cheesy core and smearing it onto a glass slide. A Wright's stain of this material will show the typical oval molluscom bodies.

   S: Small, non-tender bumps on the genitals or groin.
   O: Small smooth umbilicated papules
   A: Molluscum Contagiosum
   P: Cryotherapy or Curettage (may be scraped off with minimal discomfort and bleeding)

7. HIV and AIDS: The human immunodeficiency virus is harmful to the immune system. It results in the body's inability to fight infection. A person who is infected may show no signs of infection but is able to transmit the virus to others through sexual contact, contaminated blood and through needle sharing. The HIV test is used to detect antibodies to HIV in the blood.

   Symptoms Associated with HIV:

0. Recurrent fever and "night sweats"
   1. Rapid weight loss for no apparent reason.
   2. Swollen lymph glands
   3. Fungal infection causing whitish spots or coating of the tongue or throat.
   4. Constant tiredness
   5. Diminished appetite or diarrhea

PREVENTION: Practice safe sex, use a condom, do not abuse IV drugs and as medical staff use precautions with all body fluids.

THERE IS NO CURE!!!

Endocrine System

The endocrine system functions to maintain homeostasis of the body's internal environment. It maintains a fine balance between too much or too little-too much glucose or not enough thyroid hormone. The endocrine system secretes chemical substances called hormones directly into the bloodstream. The concentration is maintained at an appropriate level in the bloodstream by a "feedback" control mechanism. If the hormone concentration increases, further production of the hormone is inhibited. When the concentration decreases, production of the hormone is then stimulated. Hormones are the main regulators of metabolism, growth and development, reproduction and stress response. All endocrine disorders are caused by either excess or deficiency of the hormones.

ANATOMY AND PHYSIOLOGY OF THE THYROID

The thyroid is located in the neck and has an "H" shaped appearance. The hormones formed are T3 and T4. Iodine is necessary for the formation of T3 and T4. If iodine is lacking in the diet, the thyroid fails to make the hormone and gets very large, increasing tissue in an effort to compensate-resulting in a goiter.
The hypothalamus secretes TRH-Thyroid Releasing hormone which stimulates the pituitary to secrete TSH-Thyroid Stimulating Hormone which stimulates the thyroid to produce T3 and T4. The blood level of T3 and T4 functions as the feedback control mechanism for pituitary and hypothalamus.

1. Normally when T3 and T4 levels fall, TRH and TSH levels should be increased to stimulate the thyroid.
2. Normally when T3 and T4 levels rise, TRH and TSH levels should be decreased to inhibit the thyroid.

EXAMINING THE THYROID

Look at the patients neck from the front. Note the presence of old surgical scars, distended veins, or redness. Watch the movement of the thyroid gland the patient swallows. Examine the head and neck distal to the thyroid; observe the position of the trachea. Then examine the thyroid: one widely recommended method is to palpate the patients neck with the fingertips of both hands while standing behind the seated patient. Locate the cricoid cartilage, a very important step when the thyroid gland is normal or subnormal in size. When your index fingers rest just under the lower rim of the cricoid, the lower portion of those fingers is over the top of the thyroid. Rotate your second and third fingers over the rest of the gland, evaluating its size, contour, consistency, and freedom of movement.

HYPOTHYROIDISM: Results from inadequate production of the thyroid hormone, causing a hypometabolic state. If very severe it is also called Myxedema.

S: Weakness, fatigue, cold intolerance, constipation, and weight gain.
O: Dry hair and skin, brittle nails, diminished muscle strength and reflexes. May have a puffy face and eyelids, thick tongue and bradycardia.
A: Hypothyroidism/Myxedema
P: Refer to the MD/PA
Treatment is to replace the T4 with oral thyroid medication.

HYPERTHYROIDISM: Is the result of excessive production of thyroid hormone. The most common cause is Graves disease. This is an autoimmune disorder. Abnormal antibodies are made that stimulate the thyroid by binding at the same site as the TSH. With the increased T3 and T4 production, TSH stimulation is stopped by the feedback mechanism, but the hormone production continues. This is due to the antibodies taking over the function of stimulating the thyroid and all control is lost. Hyperthyroidism may also be caused by a tumor in the thyroid or by a tumor in the pituitary that secrete excessive TSH.

S: Weakness, sweating, weight loss, increased appetite, fatigue, nervousness, diarrhea, and heat intolerance.
O: Tachycardia, warm this moist skin, tumors, hyperactive reflexes, exophthalmos (Bug Eyes), palpable thyroid or goiter. If long standing, wasting of muscle may occur.
A: Hyperthyroidism
P: Refer to the MD/PA

NOTE: Exophthalmos is caused by disposition of fat in back of the globe causing forward protrusion.

ANATOMY AND PHYSIOLOGY OF THE PANCREAS

The pancreas is located behind the stomach horizontally. It's head is attached to the duodenum and its tail reaches to the spleen. Scattered throughout the spleen are groups of cells referred to as the islets of Langerhans that secrete insulin. Insulin lowers the blood glucose by assisting the movement of glucose into the cells. The blood glucose level rises because glucose cannot enter the cells where it is used for energy. Without insulin the serum glucose level rises because the glucose cannot enter the cells, it then spills over into the urine. How much insulin is released into the body is normally determined by the level of sugar in the blood which works as a feedback system.

Diabetes Mellitus: A disorder of carbohydrates (glucose) metabolism, characterized by hyperglycemia (elevated level of glucose in the blood) and glycosuria (glucose in the urine). This is the result of inadequate production or utilization of insulin. There are two types.

Type I Diabetes-occurs abruptly with an absence of insulin due to a decline in the insulin producing cell (autoimmune destruction?). Because of the periodic administration of insulin it is called insulin dependent diabetes.

Type II Diabetes: most common type (90%), affects people who are over 40 years of age, and overweight. It is usually controlled by a diet, exercise, and oral antidiabetic drugs.

S: Three classic symptoms- polyuria, polydipsia, and polyphagia, or urinates, drinks, and eats very often. Weight loss, fatigue, recurrent infections, pruritis, or may be asymptomatic.
O: Variable physical findings, only reliable findings is an elevated blood glucose on a fasting specimen. U/A may have glucose.

Pharmacology - Medical Therapeutics

It is essential that all medications should be carefully explained to the patient, including why the medication is being given, expected response, how to take the medication, and side effects of the drug. Care must be taken to review the patients drug allergies or reactions and make certain they are recorded in the health record. Explain the proper use of topical medications (creams and ointments) and medications for the eye, ear, nose. Be specific when soaks, heat treatments, etc., are prescribed as to minutes for treatment and how often they are to be done.

Prescriptions:

Prescriptions should be written legibly in terms the patient could understand using proper abbreviations, terms and spelling the medication correctly.

Abbreviations:

b.i.d. = two times a day	o.u. = both eyes
c = with	p.c. = after meals
caps. = capsule	po = by mouth
gtt. = drop	prn = as needed
ac = before meals	q. = every
h = hour	q2h = every two hours
h.s. = at bed time	q.i.d. = four times a day
o.d. = right eye	sig. = write on label
o.s. = left eye	t.i.d. = three times a day

Writing Prescriptions: Complete prescriptions in the following format.

1. Name, Rate, SSN, Command or Duty Station.
2. Date of the prescription.
3. Medication Information:
    a. Name of medication
    b. Dosage (mg.,&,cream,pill etc.)
    c. Number dispensed.
    d. Sig: Instructions to the patient that will be written on the label.
        - amount taken
        - how many times a day
        - how taken (orally,drops,rectally,etc.)
4. Signature, stamp with name and rank below name.
5. **ALL PRESCRIPTIONS MUST BE SIGNED BY SUPERVISING MEDICAL OFFICER!!**

ANTIBIOTICS

ORAL:

PENICILLIN VK: 250mg 1 to 2 qid x 10 days.
Indications: Penicillin sensitive organisms such as streptococcus

Ampicillin: 250mg 1 to 2 qid X 10 days.
Indications: Respiratory, GI, Urinary, and ENT problems.

Amoxicillin: 250mg 1 to 2 tid X 10 days
Indications: Ear, Nose, Throat, Sinus, or Urinary Tract Infection.

Dicloxicillin: 250mg 1 to 2 qid X 10 days
Indications: Skin or soft tissue infections.

Erythromycin: 250mg 1 to 2 qid X 10 days
Indications: Ear, Nose, Throat, Respiratory, Skin, and Urogenital Infection.

Septra or Bactrim (Sulfamethoxazole and Trimethorpim) D.S.
1 bid X 10 days
Indications: Acute Otitis Media, Bronchitis, Sinusitis, and GU Infections.
Precaution: Do not give to a patient allergic to Sulfa medication

Tetracycline: 250mg 1 to 2 qid X 10 days.
Indications: Acne, Bronchitis, NGU infections.

Doxycycline: 100mg 1 bid X 10 days
Indications: Acne, Bronchitis. NGU infections.

Velosef (Cephradine): 250mg 1 to 2 qid X 10 days
Indications: Otitis Media, Respiratory, Urinary, Skin, and Soft Tissue infections.

TOPICAL:

Bacitracin ointment: Apply 2 to 4 X daily
Indications: Superficial skin infection, prophylaxis on minor Wounds.

Erythromycin solution (Staticin): Apply a thin film bid
Indications: Acne

Clindamycin solution (Cleocin T): Apply a thin film bid
Indications: Acne

OPTHALMIC (EYES) MEDICATIONS

Sodium Sulfacetamide (Sulamyd): 2 drops every 6 hours
Indications: Conjunctivitis **PRECAUTION:** If allergic to sulfa drugs

Gentamicin (Garamycin): 2 drops every 4 hours
Indications: Conjuctivitis

Erythromycin Opthalmic Ointment (Ilotycin): apply 3 to 4 X daily
Indications: Conjuctivitis

ANTITUSSIVE

NOTE: Suppresses the response of the cough center. Should be used with caution in respiratory conditions like pneumonia, in which thick secretions are present, because this drug may impair mobilization of secretions.

Robitussin DM (Dextromethorphan in Guaifenesin)
2 teaspoons (10ml) every 6 hours
Indications: Non-productive Cough

ANALGESICS-ANTIPYRETICS (Pain-Fever)

Tylenol and Tylenol ES (Acetaminophen)
2 PO every 4 hours or if ES 2 PO every 6 hours
Indications: Pain, Fever, Headache.

Aspirin (Acetylsalicyclic acid): 325mg 2 tabs every 4 hours
Ecotrin: Enteric coated ASA (not digested in stomach)
Ascriptin: ASA with an antacid
Indications: Pain, Fever, Headache, Inflammation of Joints.

ANALGESICS & ANTI-INFLAMMATORY

NOTE: Non-Steroidal anti-inflammatory drugs (NSAIDS) should be used with caution in patients with a history of ulcer or GI problems.

Motrin, Advil (Ibuprofen) 400-600mg qid or 800mg tid with food
Indications: Pain, Fever, Inflammation.
(Use Motrin prior to using NSAIDS)

Naprosyn (Naproxen) 500mg initially, then 250mg every 8 hours
Indications: Inflammation, Arthritis.

Tolectin DS (Tolmetin) 400mg tid or qid
Indications: Inflammation or Arthritis.

BRONCHODILATORS

Proventil, Ventolin Inhalers (Albuterol) or
Alupent Inhalers (Metaproterenol) 2 to 3 puffs every 4-6 hours
Indications: Asthma, Chronic Bronchitis, Emphysema.

OTIC-(EAR) MEDICATIONS

Cortisporin Otic Sunspension (mixture of hydrocortisone, Neomycin, and Polymyxin)
4 to 5 drops into the infected ear every 4 to 6 hours
Indications: Infection and inflammation of external otitis.

Debrox: 5 to 10 drops in ear canal 2 times a day for 2 to 3 days then irrigate the ear.
Indication: Cerumen (ear wax) removal.
PRECAUTION: Do not use if ear drum is perforated.

ANTHISTAMINES

NOTE: These medications cause drowsiness, associated with dizziness, paradoxical excitement and hypotension.

Benadryl (Diphenhydramine) 25 to 50 mg TID to QID
50mg IM (for anaphylaxis)
Indications: Allergic Rhinitis, urticaria, pruritis, and Anaphylaxis.

Atarax (Hydroxyzine) 10 to 25mg tid to qid
Indications: Urticaria, Allergic Pruritis, Anxiety.

CTM, Chlortrimeton (Chlorpheniramine Maleate) 4mg qid or 8mg bid
Indications: Allergic Rhinitis, Allergic Conjuctivitis, Pruritis.

Seldane (Terfenadine) 60mg 1 to 2 daily Indications: Allergic Rhinitis, Pruritis.
Note: Least sedating, less drowsiness.

ANTIHISTAMINE AND DECONGESTANT

Actifed (Tripolodine and Psuedoephedrine) 1 tab every 6-8 hours
Indications: Allergic Rhinorrhea and Congestion.

Dimetapp (Dexbrompheneramine) 1 tab bid
Indications: Allergic Rhinorrhea and Congestion

DECONGESTANTS

Sudafed (Psuedoephedrine) 30mg or 60mg tabs: 60mg every 6 hours
Indications: Nasal Congestion and Eustachian Tube Dysfunction.

Entex LA, Duravent (Phenylpropanolamine Guaifenesin) 1 cap bid
Indications: Nasal Congestion, Eustachian Tube Dysfunction.

EXPECTORANTS

NOTE: These medications increase respiratory tract fluid by decreasing the stickiness and thickness of the secretions, making their removal easier. They should be taken with a glass of water to help loosen the mucous secretions in the lungs.

Robitussen (Guaifenesin) syrup: 2 teaspoons (10ml) every 4 hours
Indications: Non-productive cough.

Humibid LA (Guaifenesin) 1 to 2 tabs every 12 hours
Indications: Dry, non-productive cough, and related conditions such as sinusitis, bronchitis, and asthma, when complicated by sticky mucous and congestion.

MUSCLE RELAXENTS

Flexeril (Cyclobenzaprine) 10mg tid
Indications: Muscle Spasm.

Parafon Forte DSC (Chlorozoxazone) 1 tab qid
Indications: Muscle Spasm.

ANTI-DIARRHEAL DRUGS

Kaopectate (kaolin and Pectin) 2 to 4 tablespoons (60 to 120 ml), or two tabs after each loose or watery bowel movement.> Indications: Diarrhea

Imodium (Loperamide) 2 caps initially, then I cap after each unformed stool. (limit: 8 caps daily)
Indications: Diarrhea

Note: Do not use if diarrhea is due to poisoning or a bacterial infection that enters the intestinal wall, because the loss of the intestinal contents (diarrhea) is a protective mechanism.

LAXATIVES

Milk of Magnesia (MOM) 1 to 2 tablespoons (30 to 60ml) orally h.s.
Indications: Constipation

Metamucil (Psyllium Hydrophilic Mucilloid) 1 teaspoon in 8oz liquid 1-3 times daily
Indications: Constipation.

HEMORRHOIDAL PREPERATION

Anusol (Pramozine HCL) or Anusol HC (with Hydrocortisone) Cream, Ointment, and Suppositories: 2 to 3 times daily
Indications: Relief of pain and itching caused by hemorrhoids and Anorectal irritation.

ANTACID

Maalox (Aluminum and Magnesium Hydroxide) or
Mylanta (with Simethicone for flatulence and gas)
2 to 3 teaspoons (10 to 15ml)or 2 tabs between meals and bedtime
Indications: Hyperactivity, and with Simethicone: Flatulence

Gaviscon (Aluminum Hydroxide, Magnesium) Chew 2 tabs followed by half glass of water: 4 times daily and bedtime
Indications: Acid indigestion due to Acid Reflux.

ANTIEMETICS

Tigan (Trimethobenzamide) 250mg cap tid or qid, also as an IM inj.
Indications: Vomiting

Antivert, Bonine (Meclizine): chewable 25mg tabs
Indications and Dosage: For motion sickness: 1-2 tabs q 4-6 hours
For vertigo: 2 tabs bid

Dramamine (Dimenhydramide) 50mg: 1-2 chewable tabs q 4-6 hours
Indications: Motion Sickness, Antiemetic
Note: Limit 8 tabs daily

TOPICAL ANTIFUNGAL MEDICATIONS

Lotrimin, Mycelex, (Clotrimazole) Cream:
Apply thinly and massage into affected area and surrounding areas every morning and evening for 1 to 4 weeks.

Monistat derm Cream (Miconazole): Apply bid for 2 to 4 weeks

Spectazole Cream (Econozole): Apply bid

Tinactin, Pitrex Solutions (Tolnaftate): Apply bid

Itch Away, Desenex Powder (Undecylenic Acid): Apply to feet PRN
Indication: Fungal Infections

CORTICOSTEROIDS

Note: These medications are used to reduce skin inflammation and pruritis.

Hydrocortisone Cream: .5 and 1% strengths, 30gm tube, apply 2-4 times daily.
Indications: Inflammatory dermatitis on face, groin, armpits, and for sebborrheic dermatits.

Westcort (Hydrocortisone Volerate) Cream or Ointment
.2%, 15gm tube, apply 2 to 4 times daily
Indications: Inflammatory Skin Problems (Dermatitis)
Note: More potent than hydrocortisone cream. Avoid or limit use on face.

Lidex (Flucinonide) Cream, Ointment, and Gel.
.05%, 15gm tube, apply 2 to 4 times daily
Indications: Inflammatory dermatitis not responsive to less potent drugs

ACNE PREPERATIONS

Benzogel, Desquam-X, Panoxyl (Benzoyl Peroxide) 5% to 10%
45mg tube, apply once daily for week then twice daily thereafter
Indication: Acne (Cleanse skin prior to use)

Retin-A (Tretinoin): Cream or Gel in .025, .05, and 1%
Apply once daily at bedtime. Wash face, wait 20-30 minutes before using. Squeeze a pea-sized dose out and dab it on forehead, chin, and cheeks, then spread it out. Keep away from nose, mouth, eyes.
Indications: Cystic Acne, flat warts on forehead. (Wash 2X daily)

ANTIPARASITIC MEDICATIONS

Kwell (Lindane): Cream and Shampoo
Note: Cream is the most reliable source for scabies.
Indications and use:
Crab Lice: Shampoo- Apply dry to hair and work thoroughly into the hair, wait 4 minutes, then add small amounts of water until a good lather forms. Rinse and dry. Nits should be combed out.

Scabies: Cream- Apply to dry skin and rub it from the neck down including the soles of the feet. Leave on for 8 to 12 hours and shower it off. One application is usually curative. Reapply to hands if they are washed. It is normal to itch for days or weeks after treatment. Further use is not only dangerous but will worsen by causing irritation. Kwell is safe if used as directed but is toxic when over used. DO NOT REFILL!!

OTHER TOPICAL PREPERATIONS

Calamine (Zinc Oxide): A cooling drying lotion. Apply 2-4 X daily
Indications: Pruritis (Itching).

Neutroderm Lotion, Alfa Keri lotion, Eucerin Cream.
Moisturizers and lubricants, apply PRN.
Indications: Dry Skin and Pruritis.

ANTIDANDRUFF-ANTISEBORRHIC SHAMPOO

Note: The shampoo must be allowed to remain on the scalp for 5 to 10 minutes before rinsing.

Selsun Shampoo (Selenium): Use 2 times a week for 2 weeks then once every 1 to 4 weeks.

Sebulex Shampoo (Sulfur & Salicyclic) Daily or every other day then 1 to 2 times weekly.

Sebutone Shampoo (Coal Tar, Sulfur, Salicyclic Acid) Every other day, then 1 to 2 times weekly.

HERPES MEDICATION

Zovirax (Acyclovir): Used for initial and recurrent herpes infection.
Capsules 200mg: Initial infection of genital herpes, 1 PO 5 times a day for 10

days.
Recurrent infection, 1 PO 5 times a day for 5 days.

Ointment 5%: Apply every 3 hours 6 times a day for 7 days. Use a Rubber glove to prevent autoinocculation of other body sites or infection of others. If recurrent, begin treatment as soon as signs and symptoms are noticed.

Lesson Training Guides (LTGs)

Examination of the Abdominal Region

A. Terminal learning objective: Given a simulated patient with simulated symptoms, the student will be able to recognize potential problems and properly perform the needed exam.
B. Enabling learning objective:
    1. Identify different bowel sounds.
    2. Identify different types of hernias.
    3. Identify different organs and their position in the abdominal cavity.
    4. Identify the different symptoms of an acute abdomen.
C. References:
    1. Taber's Cyclopedic Medical Dictionary, 1989
    2. The Merck Manual, Sixteenth Edition.

I. Anatomy & Physiology
    A. The abdomen is divided into 4 quandrants.
        1. RUQ: right upper quadrant
        2. LUQ: left upper quadrant
        3. RLQ: right lower quadrant
        4. LLQ: left lower quadrant
    B. Normal palpable structures:
        1. Sigmoid colon: LLQ - firm, narrow tube
        2. Cecum and ascending colon: RLQ - a softer, wider tube
        3. Pulsation's of ascending aorta: midline in upper abdomen
    C. Less commonly palpable, but normal:
        1. Liver: just below right costal margin (*Costal- To a rib)
        2. Transverse and descending colon: RUQ & LUQ
        3. Lower pole of right kidney: RUQ deep, mostly in thin women
        4. Iliac artery: pulsation's - LLQ & RLQ
        5. Spleen tip: seldom felt - LUQ under ribs

II. General principles of exam:
    A. Conditions required:
        1. Good light
        2. Relaxed patient
        3. Full exposure of abdomen

B. Other helpful points on examination
   1. Should not have a full bladder.
   2. Supine position.
   3. Arms across chest, not above head.
   4. Ask patient where pain is, and examine last.
   5. If the patient is ticklish or frightened, initially use the patients hand under yours as you palpate. When patient calms then use your hands to palpate.
   6. 6. Watch the patient's face for discomfort.

C. Order of exam
   1. Inspection
   2. Auscultation - always perform before palpation
   3. Percussion
   4. Palpation: light & deep

III. Inspection of the abdomen

A. Contour: is abdomen flat, swollen or bloated? Is there an area that is bulging or moving?

B. Skin:
   1. Strai (stretch marks): a streak or line, may be red, white, or purple. Dark pink-purple strai of Cushing disease.
      *Cushing disease: Cushing's syndrome, in which the hypersecretion of glucocorticoids is secondary to hypersecretion of adrenocorticotrophic hormone from the pituitary (Tabers Medical Dictionary, 1989).
   2. Scars: location/appearence - describe or diagram their location.
   3. Venous: dilation - seen in hepatic cirrhosis or inferior vena cava obstruction.
   4. Color: areas of discoloration or rashes.

C. Umbilicus: contour, location, inflammation, hernia.

D. Contour of abdomen
   1. Flat, rounded, protuberant or scaphoid.
   2. Bulging flanks - seen in ascites.
   3. Local bulges - pregnancy or distended bladder.
   4. Symmetrical - asymmetry with enlarged organs or masses.
   5. Visible organs or masses - lower abdominal masses of ovarian or uterine tumor.

E. Peristalsis: increased peristaltic waves of intestinal obstruction.

F. Pulsation: increased pulsation's of aortic aneurysm.
   *Aneurysm: Localized abnormal dilation of a blood vessel, usually an artery. Due to congenital defect or weakness in the wall of the vessel.

G. Hernia:
   *Hernia: Protrusion or projection of an organ or a part of an organ through the wall of the cavity that normally contains it.

1. Abdominal - hernia through the abdominal wall.
2. Umbilical - bulging defect at umbilicus. Common in infants and generally closes by 3 y/o.
3. Incisional - defect in abdomen muscles after surgical incision. Must palpate the size of the defect.
4. Diastasis recti - not a true hernia, a separation or the two rectus abdominus muscles. No clinical significance.
5. Epigastric - small, midline protrusion through a defect in the linea alba located between the xiphoid process and umbilicus.

IV. Auscultation of the Abdomen

A. Bowel sounds (use diaphragm of stethoscope)

1. Bowel sounds are widely transmitted throughout the abdomen. Listening in one spot is usually sufficient.
2. Normal sounds are due to peristaltic activity.
   *Peristalsis: A pregressice wavelike movement that occurs involuntarily in hollow tubes of the body.
3. Normal sounds consist of clicks and gurgles.
4. Hypoactive bowel sounds are less than 3-4 sounds a minute.
5. Borborygmus - is the medical term for stomach growling. This is due to prolonged episodes of hyperperistalsis. This is normal.

B. Abnormal bowel sounds: caused by a number of illnesses. There are several typically abnormal bowel sounds:

1. High pitched tinkling: usually due to tension of air/fluid in a loop of dilated bowel. This suggest obstruction.
2. Rushes: If located at one area, usually are due to air fluid being forced through small partially occluded lumen. This suggest partial obstruction, especially if associated with concurrent abdominal activity.
3. Hyperactive: Sometimes normal if combined with abdominal complaints, can indicate early obstruction or GI bleed.
4. Hypoactive or absent bowel sounds: Sometimes can be normal, but combined with complaints can indicate paralytic ileus (a halt in peristaltic activity due to extreme irritation from obstructive peritonitis or unknown reasons).
5. Bowel sounds cannot be said to be absent unless they are not heard after listening for 3 minutes.

C. Systolic Bruit: An adventitious sound of venous or arterial origin heard on auscultation. Use bell of stethoscope.

1. Listen at midline in middle of epigastrum for whooshing or blowing systolic noise indicative of turbulent blood flow from arterial plaques or aortic aneurysm. Important to listen for if patient has vascular insufficiency of the lower extremities.

2. Listen in bilateral costovertebral angles for renal artery bruits in a hypertensive patient suggestive of renal artery stenosis.
   *stenosis: Constriction or narrowing of a pasage or orifice (Tabers Medical Dictionary, 1989).
3. Listen over femoral areas for femoral artery bruits, in patients with lower extremity vascular insufficiency.

D. Venous Hum (rare) - epigastric/umbilical area.
1. Soft humming noises with both systolic/diastolic component.
2. Indicates increased collateral circulation between portal and venous systems as in hepatic cirrhosis.

E. Friction rubs (rare):
1. Right and left upper quandrants
2. Grating sound with respiratory movement
3. Indicates inflammation of peritoneal surface of an organ.

F. Succession splash:
1. Splashing sound indicative of air or fluid in body cavity with shaking individual: normal in s stomach.

V. Percussion

A. General Principles
1. Technique as described in thorax/lungs.
2. Percuss lightly in all quandrants.
   a. Assess areas of dullness and tympanny. Tympanny usually predominates.

B. The Liver
1. Percuss upward in right mid-clavicular line (MCL) from below umbilicus.
2. Ascertain lower liver border dullness.
3. Percuss from lung resonance downward on right MCL to ascertain upper margin of liver dullness.
4. Normally 6-12cm in right in right MCL.

C. The Spleen
1. Searching for the small area of dullness is seldom worthwhile unless you suspect splenomegaly.
   *Splenomegaly: Enlargement of the spleen (Tabers Medical Dictionary, 1989).
2. Percuss in the lowest interspace in the left mid-axillary line. Have the patient take a deep breath and hold. Repercuss the same area. Change from tympanic to dull indicates splenomegaly.
3. Percuss in several directions from resonance or tympanny toward forward estimates area of splenic dullness to outline its edges.

VI. Palpation
- A. Light palpation
  1. Gentle horizontal dipping motion with finger tips.
  2. Have the patient supine with knees slightly flexed.
  3. Identify muscular resistance and abdominal wall tenderness.
- B. Deep palpation
  1. Place one hand on top of the other. Press with outer hand and feel with inner hand.
  2. Palpate tender areas last.
- C. Palpation of specific organs.
  1. Liver
     a. Place left hand posteriorly parallel to and supporting 11th & 12th ribs on right.
     b. Place right hand in upper quandrant well below area of liver dullness.
     c. Have the patient take deep breath and feel liver margin for smoothness, firm sharp edge, and tenderness.
     d. An obstructed distended gall bladder may form an oval mass below the edge of the liver t that merges with the liver edge.
     e. Start well below expected area of liver.
  2. Spleen
     a. Seldom palpable in normal adults. Causes include COPD, and deep inspiratory descent of the diaphragm.
     b. Support lower left rib cage with left hand while patient is supine and lift anteriorly on the rib cage.
     c. Palpate upwards toward spleen with finger tips of right hand, starting well below left costal margin.
     d. Have the patient take a deep breath.
     e. Palpate for spleen as it descends.
     f. fA palpable spleen is almost always abnormal. Infectious mononucleosis may cause splenomegaly.
     *Mononucleosis: Presence of an abnormally high number of mononuclear leukocytes in the blood (Tabers Medical Dictionary, 1989).
  3. Kidney
     a. Place left hand posteriorly just below the right 12th rib. Lift upwards trying to displace the right kidney anteriorly.
     b. Palpate deeply with right hand on anterior abdominal wall.
     c. Have the patient take a deep breath.
     d. Feel for lower pole of kidney as it descends and try to capture it between your hands.
     e. Have the patient release breath. Slowly release the kidney and feel it slide back into place.

f. Try the same on the left kidney, but is seldom palpable.
g. Costovertebral angle tenderness (CVA tenderness)
a. With patient seated upright, place palm of left hand over each costovertebral angle.
b. Strike back of left hand with ulnar surface of right fist.
c. Tenderness elicited suggest kidney infection such as pyelonephritis or perinephric abcess.
*pyelonephritis: Inflammation of kidney substance and pelvis.
*perinephric abcess: Absess formation in the peritoneal membrane surrounding the kidney (Tabers Medical Dictionary, 1989).

4. Inguinal/Femoral areas
a. Check bilateral inguinal areas for lymph node enlargement. Common causes include: STD, Athletes foot, bug bites and lacerations/abrasions to lower extremities.
b. Palpate for femoral pulses.
c. Check for inguinal and femoral hernias.
5. Aorta
a. Press deeply in upper abdomen slightly lateral to midline on both sides.
b. Assess width of aorta pulsations. Normal is 2.5cm in width, not including abdominal wall thickness.
c. Prominent pulsations with lateral expansion suggest an abdominal aortic aneurysm.

VII. Evaluation of Acute Abdomen/Appendicitis
A. Pain
1. Visceral (originating from the intra-abdominal organs)
a. Usually dull quality
b. Poorly localized
2. Peritoneal irritation
a. Sharp, severe, intense pain
b. Localized to specific areas
c. Coughing increases the pain
B. Signs of peritoneal irritation in acute appendicitis
1. Progression of pain
a. Begins in umbilical area
b. Localizes in right lower quandrant
2. Guarding/muscular rigidity
a. Voluntary guarding by tightness of muscle against palpation.

   b. b. Involuntary resistance, progressive abdominal rigidity. Patient is unable to relax muscles. Body's protective function against pain.
3. Localized tenderness - usually in RLQ or right flank pain.
4. Rectal exam reveals right sided rectal tenderness. May indicate inflammatory process other than appendicitis.
5. Rebound tenderness
6. Rovsing's sign (referred tenderness): tenderness/pain in RLQ during left sided pressure.
7. Referred rebound tenderness
8. Psoas sign: An increase in pain from passive extension of the right hip joint that stretches the iliopsoas muscle (Tabers Medical Dictionary, 1989).
9. Place right hand above right knee of the patient.
   a. Have the patient flex right knee against resistance.
   b. Alternatively, have the patient turn to side, extend right leg at right hip.
   c. Pain with maneuvers suggests irritation of Psoas muscle.
10. Obturator sign
   a. Flex patients right thigh at hip with right knee bent.
   b. Internally rotate the leg at the hip.
   c. Pain elicited suggest irritation of obturator muscle.
11. Cutaneous Hyperesthesia: Increased sensitivity to sensory stimuli, such as pain or touch.
   a. At a series of points down the abdominal wall, gently pick up skin folds between finger and thumb without pinching the skin.
   b. Localized pain elicited in the RLQ may accompany appendicitis.
12. Acute Cholecystitis: Inflammation of the gallbladder.
   a. RUQ pain and tenderness
   b. Murphy's sign: When the inflamed gallbladder is palpated by pressing the fingers under the rib cage, deep inspiration causes pain because the gallbladder is forced down to touch the fingers.
      1. Hook fingers under costal margins on the right.
      2. Have the patient take deep breath.
      3. Sharp increase in tenderness with sudden stop in inspiration is positive.
      4. Positive sign is indicative of gall bladder disease.
13. Intra-abdominal mass vs. abdominal wall mass
   a. Have the patient tighten abdominal muscles wall.
   b. Mass in abdominal wall remains palpable where as intra-abdominal mass will be obscured.

Cardiovascular Disorder and Exam Techniques

Allotted time:

Instructional references:

1. Brady Emergency Care (7th Edition)
2. American Heart Association Basic Life Support for Health Care Providers
3. Lippincott Manual for Physical Exams

Instructional Aids:

1. Visual aid panel
2. Transparencies Student handout

Terminal learning objectives: Given a simulated patient with simulated symptoms, the pupil will be able to recognize potential problems and properly perform the needed exam.

Enabling learning objective:

1. Be able to identify the different disorders of the cardiovascular system.
2. Be able to identify the signs and symptoms of different cardiovascular disorders.
3. Be able to identify the treatment of different cardiovascular conditions.
4. Be able to identify the cardiac cycle and the different heart sounds.
5. Be able to identify the different types of murmurs and where they may be heard.
6. Be able to identify the different components of a proper cardiac exam.
7. Be able to identify the different components of the heart and cardiac vascular system.

SIGNS AND SYMPTOMS OF SELECTED CARDIOVASCULAR DISEASES

a. Cardiovascular disease–General Principles
    1. Chest pain: refer all chest pain to MO to rule out cardiac involvement. Chest pain has many causes of which cardiac is only a portion. Chest pain should be evaluated as if the patient has a potentially fatal illness.
    2. Cardiac risk factors
        a. smoking
        b. diabetes
        c. hypercholesterolemia: Excessive amount of cholesterol in the blood.
        d. hypertension
        e. obesity
        f. family HX of MI prior to age 65
        g. being male or a post-menopausal woman

b. Common disorders
    1. **Angina pectoris** - lack of O2 to the heart
        a. signs/symptoms
            1. usually substernal pain
            2. usually occurs in association to exertion (sometimes rest)
            3. usually subsides with rest
            4. Pain can be located in the neck, throat, back, lower jaw, or teeth, axilla, and epigastrim.
            5. Pain will be described as squeezing, crushing, almost vice like. Often a fist is used to describe the pain (Levine's sign).The intensity varies from mild to severe.
            6. Duration can last anywhere from a few minutes to 5 minutes.
            7. Patient may experience palpitations, faintness (but does not faint), diaphoresis, dyspnea, and symptoms mimicking digestive complaints. May complain of indigestion.
        b. Treatment
            1. Refer to MO STAT
            2. Give basic emergency care and O2 if available.
            3. Sublingual nitroglycerin will relieve the pain-must be ordered by MO.
            4. If you suspect angina, obtain an EKG, but do not let the EKG delay your notification of the MO
    2. **Myocardial infarction (MI)** - This is acute death of the heart muscle.
        a. Signs/symptoms
            1. May be similar to hx of angina
            2. Severe to mild squeezing, crushing, substernal pain. Usually worse than angina, but not always
            3. location similar to angina
            4. Pain persists, even with rest
            5. dyspnea/cyanosis
            6. distress secondary to anoxia or pain
            7. hypoperfusion (shock)
            8. pulmonary edema
            9. diaphoretic
            10. variable blood pressure
            11. variable pulse
            12. syncopal symptoms
            13. nausea and/or vomiting
            14. clammy skin
        b. Treatment
            1. BLS, o2, emergency
            2. Refer to MO or ER STAT

3. **Hypertension** - involves the elevation of the systolic and/or diastolic blood pressures.
    1. Categories
        a. Mild: Diastolic 90-99mm/hg
           Systolic 140-159mm/hg
        b. Moderate: Diastolic 100-109mm/hg
           Systolic 160-179mm/hg
        c. Severe: Diastolic 110-119mm/hg
           Systolic 180-209mm/hg
        d. Very Severe Diastolic > 120mm/hg
           Systolic > 219mm/hg
    2. Signs/symptoms
        . NONE–MOST COMMON ("the silent killer")
        a. headache or fatigue
        b. dizziness
        c. epsistaxis (nosebleed)
        d. shortness of breath
        e. visual disturbances
        f. chest pain–"ripping"
    3. Treatment
        . refer to MO
        a. stop smoking
        b. stop alcohol
        c. relief of stress
        d. regular exercise
        e. low sodium diet
        f. decrease weight
        g. medication but depends on severity of HTN (MO to decide)
    4. Blood pressure evaluation (BPE's)
        . Ordered by the MO, this is used only for patients who are found to have a mildly elevated BP on routine screening. BPE's are ordered to establish the diagnosis of HTN.
        a. Have patient return for a 5 day blood pressure evaluation which consist of A.M. and afternoon readings. BP and pulse should be taken lying, sitting, and standing.
        b. Each reading should be shown to MO daily.

THE CARDIAC CYCLE

1. General
    a. Ventricular systole is the period of ventricular contraction.
    b. Ventricular diastole is the period of ventricular filling.
2. Relation of heart sounds to chest wall.

a. The base of the heart is at the left and right 2nd interspace, close to the sternum.
b. The aortic area is the right 2nd interspace just lateral to the sternal border.
c. The pulmonic area is the left 2nd and 3rd interspace just lateral to the sternal border.
d. The tricuspid area is just lateral to the lower left sternal border.
e. The mitral area is the left 5th interspace just medial to the midclavicular line (MCL). This is the apex of the heart.
f. The various areas overlap to some extent.
g. Remember "Apartment M" as you march from the upper right chest to left lower chest A - aortic
P - pulmonic
T - tricuspid
M - mitral

3. Heart sounds
    a. S-1
        1. closure of mitral and tricuspid valves
        2. heard best in mitral area
        3. initiation of systole
    b. S-2
        1. closure of aortic and pulmonic valve
        2. heard best in aortic/pulmonic areas
        3. initiation of diastole
    c. S-3
        1. heard in early diastole, after S-2
        2. It is pathologic. Seen in conditions of volume overload or cardiac failure.
    d. S-4
        1. heard just before S-1
        2. Is due to increased ventricular resistance with ventricular filling during atrial contraction.
        3. Is associated with hypertensive disease and aortic stenosis but may sometimes be normal in young healthy people and pregnant women.
    e. S-2 splitting
        1. During inspiration S-2 splits into two heart sounds, A-2 and P-2 (S2=A2+P2).
        2. The pulmonary component (P-2) is heard best in the 2nd and 3rd interspaces close to the sternum. It comes before A-2.
        3. Aortic component (A-2) is louder and is heard well over the entire pericardium.
        4. The splitting of S2 into A2 and P2 is a normal finding.

4. Murmurs
    a. Definition: Auditory vibrations resulting from turbulence of blood flow, through narrowed valves (stenosis), backwards flow (regurgitation), or abnormal passages (shunts). Typically a whooshing quality of sound.
    b. Parameters in assessment of murmurs.
        1. intensity (loudness)
        2. Pitch
        3. configuration (shape) (i.e., creshendo, diamond-shaped)
        4. quality
        5. duration
        6. radiation
        7. timing in cycle
    c. Categories of murmurs
        1. systolic: best classified by time of onset and termination. May be functional or innocent.
            a. pan systolic - starts with S-1 and ends with S-2 without a gap between murmur and heart sounds.
            b. mid-systolic - begins after S-1 and ends at or before S-2.
            c. late systolic - begin in mid to late systolic and ends with S-2.
        2. diastolic: classified by time of onset and termination. ALWAYS PATHOLOGIC.
            a. early - begins with S-2
            b. mid - begins at clear intervals after S-2
            c. late diastolic - begin in mid to late diastole and ends with S-1

                Cardiac Cycle:

    d. Other types
        1. Some specific murmurs are identified by area of auscultation, parameters, and time of cycle.
            a. Aortic stenosis
                a. 2nd right interspace
                b. radiation to neck and down left sternal border
                c. often loud and with a thrill
                d. medium pitch
                e. harsh quality
                f. heard best with pt sitting and leaning forward
            b. Pulmonic stenosis
                a. 2nd and 3rd left interspace
                b. radiation to left shoulder and neck
                c. soft to loud, may have a thrill
                d. medium pitch

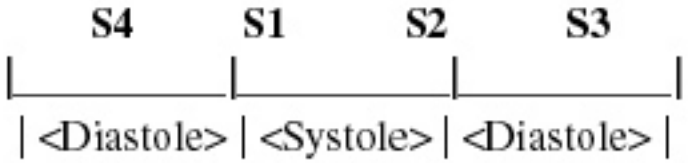
e. harsh quality

c. Pansystolic murmurs
    1. Mitral regurgitation
        a. located in apex
        b. radiation to left axilla
        c. soft to loud with possible apical thrill
        d. medium to high pitch
        e. blowing quality
        f. doesn't get louder with inspiration
    2. Tricuspid regurgitation
        a. lower left sternal border
        b. radiation to right sternum to xiphoid area or midclavicular line. Never to axilla.
        c. variable intensity
        d. medium pitch
        e. blowing quality
        f. gets louder with inspiration
    3. Diastolic murmurs
        1. Aortic regurgitation
            a. 2nd and 4th left interspaces
            b. grade 1 to 3
            c. high pitch - use diaphragm of stethoscope
            d. blowing quality
            e. Heard best with patient sitting and leaning forward and with breath held in expiration.
        2. Mitral stenosis
            a. limited to apex
            b. no radiation
            c. grade 1 to 4
            d. low pitch - use bell of stethoscope
            e. listen at apical impulses with patient in left lateral position

5. SBE (subacute bacterial endocarditis): often develops on abnormal valves after asymptomatic bacteremias from infected gums, or GU or GI tract.
    1. It is recommended that antimicrobial prophylaxis be performed for patients with valvular or other predispositions to infectious endocarditis when undergoing procedures associated with bacteremias and subsquent infectious endocarditis. Examples of these procedures are:
        a. oral-dental procedures, to include cleanings, tonsillectomy, or adenoidectomy (viradans streptococci)
        b. GI/GU tract infections (enterococci)
        c. cardiac valvular surgery (Staphylococcus aureus & epidermidis)

2. Prophylaxis regimen
    . Amoxicillin 3.0 gm PO 1 hr before procedure, then 1.5 gm PO 6 hrs later
    a. PCN allergic: E-mycin 1.0 gm PO 2 hrs before procedure, then 1/2 dose (0.5 gm) 6 hrs later

6. Techniques of examination
    . Position
        0. Have patient lying with upper body elevated at 30 degrees.
        1. Stand on patients right side.
        2. Use a quiet room for examination.
    a. Inspection and palpation
        0. Observe for abnormal pulsation.
        1. Palpate with the ball of your hand for thrills/pulsations.
            a. aortic area - pulsation of aortic aneurysm or thrill of aortic stenosis, accented on closure.
            b. 2nd left interspace pulsation of increased pulmonary artery pressure. Felt during held expiration.
            c. right ventricular area - left sternal border in 3rd, 4th, and 5th interspaces for right ventricular impulse.
            d. apical or left ventricular area - feel for apical impulse, usually at 5th interspace just medial to left MCL.
                0. note position, duration, intensity and amplitude.
                1. may be laterally displaced in left ventricular enlargement
                2. normally light tapping 1-2 cm diameter area
    b. Auscultation
        0. To listen for the heart sounds, start in the right 2nd interspace, left 2nd interspace then the 3rd, 4th, and 5th interspaces and finally to the apex. (APT-M)
        1. Identify S-1, S-2 (begin in aortic/pulmonic area)
            a. S-1 is the first paired heart sounds
            b. S-2 normally louder in aortic area
            c. S-1 immediately precedes carotid impulse



        2. Identify heart rate
            a. Determine number of beats per minute
            b. bradycardia (slow heart rate) below 60 bts/min

c. tachycardia (fast heart rate) above 100 bts/min

3. Identify rhythm
    a. regular or irregular [regularly irregular (PVC's)] or [irregularly irregular (atrial fibrillation)]
    b. additional or premature beats on regular pattern (regularly irregular) vs no identifiable rhythm (complete irregularity or irregularly irregular)
    c. rhythm varies normally with respirations
4. Listen for extra heart sounds (S-3, S-4 murmurs or rubs)
5. Grade intensity of murmurs if present
    a. grade 1 - very faint, hard to hear
    b. grade 2 - quiet but heard easily with stethoscope
    c. grade 3 - moderately loud
    d. grade 4 - loud murmurstill need stethoscope to hear, associated with thrill
    e. grade 5 - very loud, heard with stethoscope partially placed on the chest, associated with thrill
    f. grade 6 - heard with stethoscope entirely off of the chest

7. Carotid arteries/Jugular venous pressure and pulses
    . Carotid arteries
        0. Palpate carotid pulsation just lateral to thyroid cartilage of trachea.
        1. Palpate amplitude and contour of pulsation of aortic regurgitation, lifts or bounding pulse.
        2. Auscultate with the bell of the stethoscope while patient holds breath. This is done to access for carotid bruits which may suggest carotid artery narrowing.
    a. Jugular venous pressure
        0. Observe neck for venous distention
        1. Position patient with head elevated to 30 degrees
        2. Identify external jugular vein.
        3. Identify highest point which pulsation may be seen.
        4. Estimated venous pressure from horizontal from top of pulsation to a plumb line dropped perpendicular to the top of the sternal angle. More than 3-4cm venous pressure is abnormal.

Dermatology Disorders and Examination

Allotted time:

References:

Terminal learning objectives: Given a simulated patient with simulated dermatological symptoms, the student will be able to recognize potential problems and properly perform the needed exam.

Enabling learning objectives:

1. The student will be able to identify different types of lesions.
2. The student will be able to identify the different types of common dermatological conditions.
3. The student will be able to identify the signs and symptoms of common dermatological conditions.
4. The student will be able to identify the treatment of common dermatological conditions.
5. The student will be able to identify the different components of the dermatological exam.
6. The student will be able to identify the variances of skin color.

1. Techniques of exam
    a. Inspect and palpate for:
        1. vascularity, evidence of bleeding, or bruising
        2. color
        3. moisture, dryness, sweating, oiliness
        4. use back of fingers to check temperature
        5. texture
        6. thickness
        7. mobility and turgor
    b. Observe any lesions of the skin for:
        1. location and distribution
        2. grouping and arrangement
        3. types of lesions
        4. note color of lesions
    c. Inspect and palpate
        1. nail beds of fingers and toes
        2. the hair for quantity, distribution, texture
2. Common dermatological conditions
    a. Contact dermatitis: a chronic or acute inflammation produced by substances coming into contact with the skin. Classic examples are poison ivy/poison oak.

1. Signs/symptoms
    a. itching
    b. scaling
    c. rash
    d. redness or swelling
    e. generally discrete areas are affected, i.e. only those that were in contact with irritant.
2. Treatment
    a. determine/eliminate causative agent
    b. keep area clean and dry
    c. antibiotics (if infection has developed)
    d. hydrocortisone cream (HC) 1% TAM 0.1% BID on affected area
    e. refer to MO for severe or extensive cases (i.e. prednisone TX)

b. Acne: common inflammatory pilosebaceous disease characterized by comedones, papules, pustules, inflamed nodules, and pus (purulent) filled cyst.
    1. Types
        a. comedones: 2 types
            - open: black heads
            - closed: white heads
    2. Signs/symptoms
        a. Inflamed pustules
        b. Superficial cysts and pustules
        c. Commonly on face, neck, chest, back, and shoulders
    3. Treatment
        a. Wash face with mild soap with warm water (recommend Dove soap)
        b. 5-10% benzoyl peroxide applied in the morning after washing
        c. T-stat pads (E-mycin 2% topical) bid after washing.
        d. Retin-A cream (for dry skin) or gel (for oily skin) 0.025% applied qhr after washing
        e. Tetracycline 500mg qid or E-mycin 500mg bid (in severe or refractory cases).
        f. If not responsive, consult with MO regarding Dermatology consult for Accutane therapy

c. Urticaria (hives)
    1. Signs/symptoms
        a. pruritus
        b. wheals
        c. erythema and edema

d. angioedema - diffuse swelling of loose subcutaneous tissue. **NOTE: Edema of upper airway may produce respiratory distress.**

2. Treatment
    a. Remove offending agent if possible (May be difficult to detect)
    b. Discontinue all non-essential meds
    c. Oral antihistamine - Diphenhydramine HCL (Benadryl) 50-100mg q4h or Atarax 25-50mg tid to qid
    d. For pharyngeal or laryngeal angioedema, give Epinephrine 1:1000 0.3 ml SC and refer to MO or ER STAT

d. Herpes Simplex: (cold sores) a recurrent viral infection characterized by a sudden appearance of small vesicles on base of the skin or mucous membranes, often around the mouth. Generally Type I but can be Type II from oral-genital sexual contact.
    1. Signs/symptoms
        a. Tenderness, pain, mild burning at the site, headache, malaise, fever prior to eruptions.
        b. Itching/tingling sensation
        c. Grouped vesicles
        d. Typically painful
        e. Factors that precipitate lesions: sunburns, food allergy, onset of menstruation, and disease that may produce a fever
    2. Treatment
        a. Usually heal in 2-6 weeks
        b. Use sunscreens
        c. Systemic antibiotics
        d. No corticosteroids
        e. Drying lotions
        f. Antivirals i.e. - Zovirax (Acyclovir) 200mg q4h five times a day for 5d

e. Herpes Zoster (shingles): an acute viral infection of the CNS characterized by vesicular eruptions and neuralgic pain in areas supplied by peripheral sensory nerves (dermatomes). Same virus that causes chickenpox. The pain in Herpes Zoster may resemble abdominal disease, pleurisy, MI, or migraine headaches depending on the location of involved nerve. One attack usually confers immunity. Must be seen by MO if on face
    1. Signs/symptoms
        a. 4-5 days **prior** to eruption
            1. Chills, fever, malaise, GI disturbances, and with or without pain along site of eruption.
            2. May have regional lymphadenopathy.
        b. 4-5 days

0. Characteristic crops or vesicles on an erythematous base.
1. Involved zone is usually excessively sensitive to stimuli.
2. Pain may be severe.
3. Vesicles begin to dry and scab on about 5th day.
4. Generally all are crusted and falling off in 2-3 weeks.

2. Diagnosis
    a. Difficult in pre-eruption stage.
    b. Made readily after the vesicles appear.
3. Treatment
    a. Zovirax 800mg q4h 5 times a day for 7-10 days (Must be given at onset or will not be helpful).
    b. Giving ASA with/without Codeine for pain administration and corticosteroids may relieve pain in severe cases.
    c. Refer to MO.

f. Chicken pox (varicella)
1. Signs/symptoms
    a. 9 to 21 days after exposure and 2-3 days before lesions appear, will have mild headache, moderate fever, and malaise is present.
    b. Itchy "teardrop" vesicle with red areolas.
    c. Individual lesions progress from macule to papule to vesicle with in 6-8 hrs.
    d. Upper trunk is most frequent site affected.
    e. Starts centrally and spreads distally.
    f. Spread by airborne droplets.
    g. Pneumonia is the most common serious complication in adults.
2. Diagnosis
    a. Rule out
        0. Secondary syphilis (RPR)
        1. Impetigo (C&S of lesion)
        2. Infected eczema (history)
        3. Insect bites (history)
        4. Drug rashes (history)
        5. Contact dermatitis (history)
3. Treatment
    a. Zovirax 800mg qid for 5 days
    b. refer to MO
    c. Isolate from people who have not been previously exposed. (Will require convalescent leave if in barracks).

g. Impetigo: a superficial skin infection caused by staphylococcus or streptococcus infection
    1. Signs/symptoms
        a. arms, face, and legs are commonly affected areas.
        b. May follow superficial trauma, break in skin, pediculosis, scabies, fungal, dermatitis, or insect bites.
        c. Lesions vary in size.
        d. Lesions progress rapidly from maculopapule to vesiculopustules or bullar to exudate. Lesions are often crusted and honey colored.
        e. Itching.
    2. Treatment:
        a. Dynapen (Dicloxacillin) 250mg or Kefelex (Cephalexin) 250mg qid for 10days
        b. Tap water compresses
        c. Keep area clean and dry.
        d. Topical antibiotic cream
        e. treat underlying cause

h. Eczema is characterized as a dermatitis commonly located to the legs, arms, and hands. Presents as dry, "cracked", fissured skin. (More common in older persons). Can be a genetic tendency for dry skin.
    1. Signs/symptoms
        a. Dry/cracked skin with red fissures and sometimes lichenification.
        b. Pruritus (burning sensation)
        c. Often a history of too frequent bathing in hot, soapy baths/showers.
        d. Diffuse skin involvement without identifiable borders.
        e. Distribution is generalized.
        f. Itching
    2. Treatment
        a. Increase contact with humidified air (above 50%). Room humidifiers in the bedroom are helpful.
        b. Tepid water baths with bath oils and immediate liberal application of emollient ointments.
        c. HC 1% AAA qid until resolved.
        d. topical applications of alpha-hydroxy acids, such as glycolic acid and lactic acid are effective.

i. Furuncles and carbuncles
    1. Definition
        a. Furuncles: (abcess or boil) are acute, tender perifollicular inflammatory nodules caused by staphylococci.
        b. Carbuncles: a group of furuncles, often extensive, local sloughing with slow healing.

2. Location
    a. Furuncle - neck, face, breast, buttocks
    b. Carbuncle- neck, back or trunk, thighs
3. Treatment
    a. Treat with intermittent moist heat soaks. Allow to come to head and drain. Extensive incision may spread the infection.
    b. For the nose or central facial area, it should be treated with systemic antibiotics.
    c. For multiple carbuncles and furuncles, treat same as "b"

j. Cellulitis: an acute inflammation within the soft tissue characterized by hyperemia, leukocytic infiltration and edema.
1. Signs/symptoms
    a. Skin temperature is hot.
    b. red and edematous
    c. lymphangitis (streaking) and lymphadenopathy
2. Diagnosis depends on clinical findings
3. Treatment
    a. Dicloxacillin 250mg qid or a cephalosporin orally
    b. Rocephin 1gm IM when first seen.
    c. Rest and elevate affected part
    d. Moist heat
    e. Refer to MO
    f. Possible admission to hospital.
    g. Outline area in pen to determine progression/regression during follow up.

k. Lymphangitis: an acute inflammation of the lymphatic channels
1. Signs/symptoms
    a. Red streaks, tender and irregular, develop and extend proximally.
    b. Regional lymph nodes are enlarged and tender.
    c. cFever, chills, tachycardia, headache, and leukocytosis
2. Diagnosis
    a. Red irregular streaks, extending toward regional lymph nodes from peripheral lesion on an extremity indicates lymphangitis.
3. Treatment
    a. Refer to MO

l. Lymphadenitis: inflammation of a lymph node.
1. signs/symptoms
    a. may be asymptomatic or may have pain and tenderness
    b. abscess may be present
    c. ask about weight loss/night sweats
    d. if positive refer to MO

2. diagnosis
    a. lymphadenitis and its cause is usually apparent
    b. if multiple sites, refer to MO
3. treatment
    a. treat underlying cause
    b. hot/wet applications
    c. abscesses require surgical drainage
    d. RTC in 24 hrs for F/U

m. Warts (verrucae) are a common contagious, benign epithelial tumor caused by papovirus
    1. signs/symptoms
        a. sharply demarcated
        b. rough surfaced
        c. round or irregular
        d. firm, light gray, yellow, brown, grayish black tumors 2-10mm in diameter.
        e. appears on fingers, elbows, knees, face, scalp
    2. diagnosis by appearance
    3. treatment
        a. refer to derm clinic or consult with MO

n. Pityriasis Rosea: a self limited, mild inflammatory skin disease characterized by scaly lesions, occurs at any age, unknown infectious agent.
    1. signs/symptoms
        a. herald or mother patch found on trunk 2-10cm in size
        b. patch usually proceeds full rash and is usually missed
        c. erythematous, rose or fawn colored
        d. scaly
        e. resembles ringworm
        f. may itch, Christmas tree pattern
    2. diagnosis
        a. clinically with woods lamp (cobalt blue)
        b. must be able to differentiate from the following
            - psoriasis
            - secondary syphilis
        c. If unsure, refer to MO.
    3. treatment
        a. no specific treatment; remission occurs within 4-5 weeks
        b. reassure patient
        c. oral antihistamines and a topical corticosteroid
        d. If patient has severe itch, may give Prednisone 10mg qid until itching subsides then decrease over a 14 day period (can also give 3-5 day burst)

o. Pediculosis: (capitis, corpus, pubis) is an infestation by lice
    1. signs/symptoms/diagnosis
        a. capitis
            - itching or scaly
            - check for nits to hair shaft (ie. eggs)
            - cannot be dislodged, unlike scales
        b. corpus
            - uncommon under good hygiene
            - nits found in body hair
            - body louse inhabit seams of clothing worn next to skin
            - itching
            - lesions are common on the shoulders, buttocks, and abdomen
        c. pubis
            - infests over anogenital region
            - OVA are attached to skin at base of hairs
            - scattering of minute specks
            - sometimes seen as bluish spots on the skin
    2. treatment
        a. wash and dry affected areas
        b. 1% gamma benzene hexachloride shampoo (kwell) apply to affected areas. Apply only to dry hair, and work well into the affected areas. Leave on for 4 minutes. Apply some water and work into lather. Rinse all lather away.
        c. reevaluate in 7 days
        d. dead nits must be combed from hair
        e. decontaminate combs, clothing, bedding, etc by washing at 140F

p. Scabies: a parasitic skin infection characterized by superficial burrows, intense pruritis and secondary inflammation seen as fine wavy dark lines.
    1. signs/symptoms/diagnosis
        a. pruritis marked, intense at bedtime
        b. lesions are the burrows
        c. lesions occur predominantly on the following
            - finger webs
            - flexor surface of the wrist
            - elbows
            - axillary folds
            - areola of the breast
            - along beltline and the lower buttocks
        d. burrows may be hard to find due to scratching and/or secondary lesions

2. treatment
    a. Kwell lotion or cream applied from tip of chin to tip of toes. Leave on 12 hours and wash off. Reevaluate in 12 weeks.
    b. 10% Crotamiton (Eurax) generally given to young children or pregnant patients. Apply to whole body from chin down. Repeat in 24 hrs. Wash off in 48 hours after last application.

q. Tineas (superficial fungal infections)
    1. signs/symptoms
        a. Capitis (head)
            - small grey patches with lusterless hairs
            - may involve all or part of the scalp
        b. Cruris (jockitch)
            - severe itching
            - typically a half moon shaped plaque with well defined scaling borders.
        c. Pedis (athletes foot): usually affects 4th and 5th toe spreading to plantar area. Lesions appear as macerated areas with scaling borders.
        d. Corporis (ring worm): lesions with borders spread peripherally and clear centrally. Typical scaly borders
    2. Diagnosis confirmed by KOH or culture.
    3. Treatment
        a. antifungal creams/lotions for 3-4 weeks
        b. Refer to MO in severe cases for possible Griseofulvin or Ketoconazole therapy.
        c. Tinea capitis does not respond well to topical treatment.

r. Tinea versicolor: an infection characterized by multiple usually asymptomatic patches of lesions varying in color from white to brown.
    1. signs/symptoms/diagnosis
        a. tan, brown, white, slightly scaling lesions seen on neck, chest, abdomen
        b. areas do not tan
        c. wood light exam
    2. treatment
        a. Selenium Sulfide (Selsun shampoo): use for one week at bed time like a lotion, then wash off in AM. Continue weekly applications afterwards, applying in shower and washing off after 10 minutes.
        b. Watch for skin irritation
        c. Advise patient that recurrence is likely and it doesn't need to be treated unless patient desires it.

s. PFB (pseudo folliculitis barbae)
    1. signs/symptoms/diagnosis
        a. Ingrown hairs resulting in papules, usually on upper neck.
    2. Treat in accordance with Navy or USMC PFB program.
    3. Retin-A at bedtime, Vioform HC in AM, & Benzoyl peroxide 5% in the AM.

t. Dyshydrosis (pompholyx)
    1. signs & symptoms
        a. Deep seated itchy vesicles on palms, sides of fingers and soles. Unkown etiology.
    2. Treatment
        a. Topical corticosteroid cream tid
        b. cold wet compress
        c. oral E-mycin, refer to MO

u. sunburn (acute)
    1. Signs/symptoms
        a. appears 1 to 24 hours and will usually pass its peak in 72 hours
        b. skin changes range from
            - erythema with scaling
            - pain
            - swelling tenderness
            - blisters
        c. fever, chill, shock may appear if a large portion of body surface is affected
        d. secondary infection is the primary complication.
    2. Treatment
        a. initially avoid oils and creams
        b. Tylenol or Aspirin for pain relief.

v. Photosensitivity: skin eruptions in response to exposure to sunlight.
    1. signs/symptoms
        a. erythema/dermatitis
        b. urticaria
        c. erythema multiform like lesions
        d. bullae
        e. chronic thick scaling patches
    2. causes
        a. numerous factors (many unknown)
        b. SLE or cutaneous LE
        c. herpes simplex
        d. drugs such as TCN and Vibramycin
    3. treatment
        a. avoidance of sunlight
        b. wear protective clothing

c. sun screen
d. R/O other factors
e. refer to MO

w. Scarlatina (scarlet fever)
1. Signs/symptoms
a. sore throat
b. chills, fever
c. strawberry tongue
d. cervical lymphadenopathy
e. rapid pulse
f. rash on abdomen, chest
g. a sequela to a streptococcal infection
2. Treatment: Penicillin V 250mg qid for 10 days (E-mycin 250mg qid for 10 d)

I. Anatomy and physiology
A. Examination
1. Whole body: look at whole body. Compare one area to another. Look at the body as a whole not just the affected areas.
2. Skin layers:
a. epidermis - thin outer layer that acts as a barrier
b. dermis - lies just below epidermis. Serves 3 major functions
1. protects body from trauma
2. contains sensory nerve endings
3. contains sebaceous glands
c. subcutaneous - lies below dermis and acts as an insulator for body and is the main depository of fat
3. Inspection: Look at the area affected in comparison with the rest of the body. Note color, texture, temperature and deformities. A culture and sensitivity (C&S) or Potassium Hydroxide (KOH) test could assist in your diagnosis of localized lesions.

II. Techniques of exams
A. skin - inspect and palpate
1. color
a. normal skin pigment greatly varies from person to person and is best determined by a part to part comparison.
b. color changes
1. erythema: a reddish tint due to increased blood flow or RBC’s seen in sunburn and high fevers.
2. cyanosis: a bluish tint brought on by a lack of oxygenated blood. Seen in pneumonia or congenital diseases, due to shunting of blood from the right to the left side of the heart.

3. pallor: a whitish tint brought on by a lack of color due to a decrease in hemoglobin content.
4. greenish-yellow: due to an increased amount of bilirubin content in the skin of sclera, more well known as jaundice.
5. orange-yellow: a pigment brought on by an increased amount of carotenoid in the skin and unlike jaundice will not be noted in sclera. Usually caused by ingestion of excess amounts of food with carotene.
6. gray: a gray color may be noted due to a deposition of mineral salts such as gold, silver, or bismuth brought on by overuse of silvadene or pepto-bismal.
7. increased/decreased pigmentation: a darkening or lightening of the skin brought on by excess or absence of melanin in the body.
8. localization pigmentation: pigmentation from the injection of foreign substances.

c. moisture: dryness, sweating or oiliness
d. temperate: generalized warmth with fever, coolness in hypothyroidism, local warmth with inflammation.
e. texture: roughness or smoothness
f. mobility and turgor: lift a fold of skin and note it's ease in movement and the speed it returns
g. lesions
    1. The principle is to accurately describe the skin lesion, which should include:
        a. distribution and location
        b. grouping and arrangement
            1. eruptions consist of one or more lesions which can be either discrete or confluent
            2. Certain lesions effect only exposed areas of the body such as poison ivy and others prefer specific locations such as herpes zoster (which occur only in dermatonal patterns).
        c. contour: describe the shape as best as possible
        d. consistency: note whether the lesions are basically the same size, contour, color, etc.
        e. size

2. Types of skin lesions
    A. Primary lesions: circumscribed, flat, non palpable
        1. macule - small, up to 1cm freckle or petechia
        2. patch - >1cm, vitiligo
    B. Palpable, elevated solid mass
        1. papule - up to 1/2 cm, elevated nevus
        2. plaque - flat, elevated surface > 1/2cm often formed by coalescence of papules
        3. nodule - 0.5 to 2cm deeper and firmer than papule
        4. tumor - >2cm
        5. wheal - somewhat irregular, transient, superficial area of localized skin edema. Insect bites and hives.

III.

A. Circumscribed superficial elevations of the skin
    1. Vesicle: up to 1/2cm filled with serous fluid i.e.. herpes simplex
    2. Bulla: >1/2cm filled with serous fluid, 2nd degree burn, blisters
    3. Pustules: filled with pus (purelence). Acne, impetigo

B. Secondary lesions - results from changes in primary lesion
    1. loss of skin surface
        . erosion: Loss of superficial epidermis. Moist but does not bleed. Old chicken pox lesions.
        a. ulcer: Deeper loss of skin surface involving epidermis and dermis. May bleed and scar.
        b. fissure: Linear crack in skin involving epidermis and dermis. Athletes foot
            1. Material on skin surface
        c. crust: Dried residue of serum, pus, blood.
        d. scale: Thin flake of exfoliated epidermis.

C. Miscellaneous lesions
    1. Lichenification: thickening and roughening of epidermis with increased visability of normal skin furrows.
    2. Excoriation: abrasions or scratch marks
    3. Keloid: hypertrophic scars

D. Vascular lesions: unduly dilated superficial veins
    1. Telangiectasia: localized fine red lines due to dilated blood vessels which may be capillaries or arterioles.
    2. Spider angiomas: Cutaneous lesions found in areas drained by the superior vena cava and is characterized by a central, red, pulsating vessels with fine, small vessels which radiate out like legs of a spider over a reddened area of about 10mm in diameter.

E. Bleeding lesions: (purpura) Which strictly means a disorder characterized by a hemorrhage into skin.
    1. petechine: tiny red or brown capillary hemorrhage not more than 0.5mm in diameter which is located within the skin papillae.

2. ecchymosis: (or bruises) This is a larger hemorrhage which can range from several millimeters to several centimeters.

IV. An important test of your examination capabilities is the ability to distinguish the difference between pre-malignant and malignant lesions.
   A. pigment nevi (moles): raised, dark brown or black lesions. May contain hair, vary in diameter from 1mm to 10mm
      1. common, usually benign, may develop into malignant melanomas
         . Suspicious characteristics include:
            A. assymetry
            B. border irregularity
            C. color changes
            D. diameter
         a. Accurate history is needed & should include:
            0. length of time
            1. changes in characteristics
            2. any evidence of rapid changes in size, color, or consistency. Refer to MO ASAP.

V. Hair: Production and loss has many normal variations.
   A. Baldness: unexpected hair loss, not uncommon in the aged or middle aged. Is hereditary. A sudden unexpected loss of hair may be a sign of underlying problems.
   B. A change in hair color or texture, such as thinning, fine, silky hair is often associated with hypothyroidism. Dry, brittle hair which disappears from lateral portions of the eyebrow are associated with hypothyroidism, and medial portions with leprosy.
   C. Excessive amount of hair growth in women, or "hirsutism" is highly uncommon. Could be due to a tumor or endocrine disorder.

VI. Nails: finger and toenails grow at approximately 1mm every 10 days and usually are the first place that cyanosis is seen. Bitten or mutilated nails may indicate an emotional or personality disorder.
   A. Clubbing
      1. Could be a normal family trait.
      2. Characterized by an extension of the horny layers of the skin over the nail.
      3. Proximal portion of the wall is elevated eliminating the angle between the nail and eponychium. Soft upon palpation of nail bed.
      4. As with most disorders, the more severe the clubbing, the more evident it will be.
      5. Diagnostic of congenital heart disease, chronic pulmonary disease or arteriovenous shunts.
   B. Inspect nails for chronic infections such as:
      1. Splinter hemorrhages - a thin, brownish flame shaped line(s) in the nail beds which could be a sign or start of a serious infection, common in a subacute bacterial endocarditis.

VII. Examination of masses: A swelling or tumor which is larger than two centimeters in diameter.
   A. When describing a mass, make sure that its done accurately. Use the list below for your description:
      1. location
      2. shape
      3. depth
      4. consistency
      5. mobility
      6. tenderness
      7. temperature
      8. color of overlying skin

VIII. Lymph nodes: a special type of mass. They are not normally palpable due to size (1-5mm diameter) with softness and mobility. They may become inflamed, causing their size to dramatically increase. Most common cause of enlargement is due to infection within the body from which lymphatic channels drain toward the node.
   A. Problems occur when metastases from neoplasms get trapped into the node. This leads to enlargment and transfer of disease from one part of the body to another. Shows as systemic disorder such as:
      1. Infections
         0. ubella
         1. mono
         2. HIV
      2. lymphoid tissue disease
         . Hodgkin's disease
         a. lymphomas
         b. leukemia's
   B. Lymph nodes may enlarge from several different causes. With each cause they will feel slightly different.
      1. Guidelines for basic consistency:
         . Moderate sized node which is firm, seperate and tender, denotes a node which is draining infection.
         a. Stony hard seen in metastatic diseases.
         b. Lymphatic neoplasm are often firm or rubbery
   C. Three areas which the nodes are easily palpable:
      1. neck
      2. axilla
      3. inguinal
   D. When lymphadenopathy is found or noted, an accurate description and exact location is very important. Any lymphadenopathy without obvious cause must be referred to an MO.

GI, GU, STD Disorders

Allotted time:

Instructional references:

Terminal learning objectives: Given a simulated patient with simulated symptoms, the student will be able to recognize potential problems and properly perform needed exam.

Enabling learning objective:

1. The student will be able to identify the different disorders of the gastrointestinal and genitourinary system.
2. The student will be able to identify the signs and symptoms of GI, GU, & STD disorders.
3. The student will be able to identify different types of sexually transmitted diseases and their causative agent.
4. Be able to identify the treatment of GI, GU, & STD disorders.

1. Gastrointestinal Disorders
    A. Acute simple gastritis
        1. signs/symptoms
            a. malaise
            b. anorexia
            c. epigastric pressure
            d. headache
            e. dizziness
            f. nausea/vomiting
            g. last for approx. 24-48 hours
            h. possible mild epigastric tenderness
        2. Treatment
            a. remove offending agent, such as food or medications
            b. use antacids to coat the stomach
            c. NPO if you suspect appendicitis
            d. give Phenergan 25mg IM/IV and IV fluids per MO order
            e. most patients will respond to antacids
            f. IV therapy to correct electrolyte inbalance if not tolerating oral fluids
            g. Above all, **maintain hydration**.

B. Gastroenteritis
    1. signs/symptoms
        a. anorexia
        b. nausea and vomiting
        c. diarrhea
        d. abdominal cramps
        e. malaise
        f. myalgias
        g. severe dehydration and shock possible
        h. abdomen distended and tender
        i. fever
    2. treatment
        a. bed rest with bathroom access
        b. clear liquid diet, maintain hydration
        c. IV rehydration with compazine/phenergan if needed
        d. follow up in 24 hours

C. Appendicitis
    1. signs/symptoms
        a. Mild to severe pain in epigastric or peri-umbilical area. Usually gets pain before vomiting.
        b. may have only one to two episodes of vomiting
        c. pain shifts to RLQ after 2-12 hours
        d. increased pace of soreness with walking, coughing, sneezing, or any jarring motions.
        e. may mimic gastroenteritis, but pain will move to RLQ
        f. may have loss of appetite
        g. may have slightly elevated temperature, 99-102 degrees
        h. moderate malaise
        i. constipation with rebound tenderness in RLQ
        j. pain is not always located in the classic position
        k. pain may make patient wish to stay still. Having the patient move may be difficult.
    2. treatment (if appendicitis is suspected refer to MO)
        a. observation
        b. NPO/bed rest
        c. NG tube per MO order
        d. refer to MO
        e. no laxatives or narcotics
        f. IV ringers lactate
        g. surgery required

D. Diarrhea (an increase in stool frequency or volume)
    1. signs/symptoms
        a. change in consistency
        b. blood
        c. mucus
        d. pus
        e. fatty materials, oil, grease (stools will float if high in fat)
    2. etiology
        a. can be caused by nerves, viral, or bacterial infection
        b. nocturnal diarrhea may suggest organic disease of the bowel
        c. may be found in family history of GI disorders
        d. different food or water as in history of travel
        e. poor water or food sanitation or poor hygiene
        f. may have fever associated with dehydration
    3. treatment
        a. dictated by cause when known
        b. clear liquids for 24 hours, then diet as tolerated
        c. Kaopectate indicated only if illness and diarrhea continues
        d. may give Lomotil or Imodium if no blood in stool or no fever
        e. if febrile or blood in stool, refer to MO for antibiotic and stool culture

E. Constipation (difficult or infrequent passage of feces)
    1. can refer to:
        a. hardness and difficulty in defecation
        b. feeling of incomplete defecation
        c. can present as an acute abdomen
        d. can be caused by decrease in fluid intake in excess of two days, causing a hard dry stool.
        e. normal defecation varies from TID to q 3 days
    2. treatment
        a. reeducate patient as to diet and fluid volumes
        b. breestablish regular evacuation
        c. have patient drink 6-8 glasses of water
        d. metamucil 3 tbsp bid with plenty of water
        e. never give a laxative if you suspect an acute abdomen

F. Inguinal Hernia
    1. etiology
        a. can be congenital
        b. caused from acute or chronic abdominal strain (i.e., lifting heavy weights, chronic constipation)
    2. Two types:
        a. Indirect - bowel protrudes through the external inguinal ring
        b. direct - bowel protrudes through the posterior wall of the inguinal canal
    3. Signs/symptoms
        a. heavy dragging sensation in groin
        b. local tenderness with sudden straining
        c. may find large inguinal mass in exam of scrotum
        d. thumb test hernia examination
    4. Treatment
        a. moist heat may provide some relief of discomfort
        b. slight maneuver pressure for reduction (MO only)
        c. always refer to MO for surgical consult
    5. Complication
        a. Incarceration - cannot be reduced by patient or manipulation
        b. Strangulation - blood supply interrupted
        c. if either occurs or suspected, refer to MO, STAT surgery is indicated

G. Hemorrhoid (piles-vari cosities or the blood vessels in the rectal passage or anus. Can be external or internal).
    1. etiology
        a. occurs with straining during bowel movement, chronic constipation, prolonged sitting, pregnancy and hereditary
    2. signs/symptoms
        a. burning, itching sensation following defecation
        b. bright red blood noted when wiping
        c. severe pain and tenderness may indicate thrombosis of hemorrhoid and require I&D
    3. treatment
        a. high roughage diet / Metamucil 2 tbsp bid
        b. establish regular bowel habits
        c. sitz baths for relief of pain
        d. suppositories
        e. topical anesthesia
        f. surgery for severe cases
        g. refer to MO if above treatments fail

2. Genitourinary disorders
    A. Basic exam
        1. penis
            a. inspect skin, foreskin, glans
            b. palpate shaft for tenderness or induration
        2. scrotum
            a. inspect contour and anterior/posterior sides
            b. palpate noted lumps, swelling, size, shape, consistency, or tenderness
    B. Disorders
        1. cystitis: is a bladder infection resulting from bacteria entering the bladder via the ureters or urethra
            a. signs/symptoms
                1. hematuria - gross or microscopic
                2. frequent urination
                3. dysuria
                4. urgency
                5. nocturia
            b. diagnosis
                1. routine U/A
                2. do clean catch
                3. C&S of urine
            c. treatment
                1. antibiotics
                2. refer to MO
                3. test to r/o venereal diseases
        2. prostatitis: bacterial infection of the prostate
            a. signs/symptoms
                1. high fever/chills
                2. urinary frequency and urgency
                3. perineal and low back pain
                4. dysuria and possible urinary retention
                5. may be gross hematuria
                6. prostatic examination (rectal) may show warm, tender, locally and diffusely swollen or indurated prostate (boggy)
            b. diagnosis
                1. U/A
                2. C&S of urine
                3. refer to MO

c. treatment
    1. may require hospitalization and bed rest
    2. analgesics
    3. IV antibiotics for sepsis
    4. Bactrim DS 1 tab bid X 20 days or Cipro 500mg bid X 20 days in outpatient therapy
    5. hot sitz baths, frequent ejaculation, abstinence from caffeine and alcohol

3. chronic prostatitis (bacterial or nonbacterial)
    a. signs/symptoms
        1. usually asymptomatic
        2. rectal exam
        3. urethral secretions
        4. U/A reveals TN TC WBC's in clumps in secretions
        5. micro or macroscopic hematuria
    b. diagnosis
        1. C&S will reveal no pathogens in urethral, bladder, & prostatic secretions in chronic nonbacterial prostatitis
    c. treatment
        1. always refer to MO
        2. hot sitz baths
        3. order C&S on urine and urethral, bladder, and prostatic secretions
        4. both bacterial and nonbacterial types improve with antibiotics
4. acute bacterial epididymitis: is usually a complication of bacterial urethritis or prostatitis. In sexually active males less than 35 y/o, it is most likely caused by N. Gonorrhea or C. Trachomatis
    a. signs/symptoms
        1. almost always unilateral
        2. need to r/o torsion testicle
        3. fever and pain
        4. swelling and induration
        5. tenderness
    b. diagnosis
        1. C&S of urine
        2. physical exam
    c. treatment
        1. bed rest
        2. scrotal support
        3. scrotal elevation
        4. ice packs
        5. analgesics

6. frequent ejaculations
7. DOC, Vibramycin 100mg bid X10-14 days and add Ceftriaxone (Rocephin) 250mg IM once in males less than 35 y/o
8. test to r/o GC/chlamydial infections

5. ureteral (renal) calculi
    a. sign/symptom
        1. back pain/CVA tenderness
        2. colicky pain
        3. GI symptoms
        4. hematuria, usually macroscopic, possibly microscopic
        5. urinary frequency
    b. diagnosis
        1. patient history of onset of pain, x-ray and U/A
        2. r/o differential diagnosis of appendicitis, cholecystitis, peptic ulcer, and pancreatitis
    c. treatment
        1. refer to MO

3. Sexually transmitted diseases
    A. gonorrhea
        - total 2 million cases a year
        - very contagious, sometimes painful
        - etiologic agent: neisseria gonorrhea
        - mode of transmission is by sexual contact
        - often also infected with Chlamydia, empirically treat both

        f. signs/symptoms
            1. males
                a. urethral discharge, 2-14 days after exposure
                b. dysuria
            2. females
                a. almost always asymptomatic, may lead to P.I.D.
                b. usually has discharge from vagina/cervix
                c. dysuria
            3. both sexes
                a. may cause septic arthritis, gonococcal dermatitis
                b. other serious illness or death
        g. diagnosis
            0. requires gram stain, males only
            1. females may be cultured
        h. treatment
            0. Rocephin (Ceftriaxone) 250mg IM plus Vibramycin 100mg bid x 7 days or Azithromycin 1.0 gm PO (one time dosage)

1. for PCN allergic pts, Spectinomycin 2mg, IM plus Vibramycin 100mg x 7 days

B. syphilis

- 325,000 cases a year
- spread through sexual contact
- etiologic agent: Traponema Pallidum

3. signs/symptoms

. chancre, primary syphilis

0. a painless sore that appears at the exposed area and around sex organ
1. sore usually infects other sexual contacts
2. occurs in the primary stage
3. appears 21-90 days after contact
4. resolves without treatment but person is still infected

a. secondary syphilis

0. occurs usually 6-8 weeks after chancre appears
1. rash on any part of the body especially palms of hands and soles of feet
2. balding spots
3. fever, sore throat
4. severe, recurring headache
5. symptoms will disappear but person is still infected

b. tertiary syphilis

0. symptoms may occur right away 0r 10-25 years later
1. tissue destruction
2. loss of hair
3. heart failure
4. insanity
5. deformity of bones

c. congenital syphilis: is passed from the infected mother to child during birth

0. blindness of infant
1. infant may be born with or develop deformities
2. death or still birth

d. neurosyphilis

0. can occur at any age
1. early signs/symptoms include optic and auditory symptoms, cranial nerve paralysis
2. requires a spinal tap for evaluation

4. diagnosis

. VDRL/RPR

a. presence of T. Pallidum seen under dark field microscope
b. FTA/ABS final diagnosis

c. damage that has occurred is permanent

5. treatment
   - Penicillin is the antibiotic of choice for all stages of syphilis.
     - Benzathine penicillin G 2.4 million u. IM produces satisfactory blood levels for 2 weeks (usually 1.2 million u. is given each buttock)
     - Two additional injections of 2.4 million u. q 7 days should be given for secondary syphilis because of treponemal persistance in the CSF of some patients after single dose regimens.
     - PCN allergic, give E-mycin 500 mg orally q 6 h for 15 days or Tetracycline (at same dosage) may be used. Pt compliance should be monitored closely.

C. Lymphogranuloma venerum (LGV)
   0. spread through sexual contact
   1. etiologic agent: Chlamydia Trachomatis
   2. signs/symptoms
      - incubation period is 5-21 days to primary lesions
      a. inguinal lymphadenopathy is most common clinical manifestation
   3. diagnosis
      - enzyme linked immunosorbent assay (elisa)
   4. treatment
      - doxycycline 100mg bid x 21 days or Azithromycin 1.0 gm PO (one dose)
      a. alternative tx is E-mycin 500mg qid for 21 days or sulfisoxazole 500mgPO qid x 21 days

D. Herpes Progenitalis, genital herpes
   0. transmitted by sexual contact
   1. etiologic agent: herpes simplex virus
   2. signs/symptoms
      - itching
      a. small red papules appear 2-8 days after sexual contact. Usually several papules appear which develop into tiny blisters.
      b. After 10 days from first appearance, crusting occurs, infection and pain subsides, healing then follows.
      c. During first 10 days, fever and swelling of the lymph nodes in the groin occurs
      d. The organism takes up permanent residence at the base of the spinal cord (dermatone)
      e. recurrent episodes caused by:
         0. trauma

1. sexual intercourse
2. emotional stress
3. infection
4. alterations in the body's physiology

3. diagnosis
    . determined by a slide specimen of papule aspirate, tzank smear
4. treatment
    . no cure at present
    a. treatment of symptoms
        0. Do not give serum globulin or steroids, both may cause infection to spread
        1. strict cleanliness
        2. Acyclovir 200mg q4h 5 times daily (new - Valcyclovir)

E. Chancroid
    0. Mode of transmission is direct contact with discharges from buboes or open lesions.
    1. etiologic agent - Haemophilus ducreyi
    2. signs/symptoms
        . incubation period is 3-10 days, may be as short as 24hrs
        a. painful, necrotizing ulceration's at site of inoculation
            0. pain, inflammation and swelling, and suppuration of regional lymph nodes in about 50% of cases
    3. diagnosis
        . culture of exudate from edges of lesions, culture of pus from buboes
    4. treatment
        . E-mycin 500mg qid x 7days or Ceftriaxone (Rocephin) 250mg IM in a single dose
        a. alternative treatment is Septra DS bid x 7days
        b. refer to MO

F. Chlamydia - most common venereal disease
    0. 3-5 million cases reported
    1. sign/symptoms
        . commonly occurs with GC
        a. can be asymptomatic, especially in women
    2. treatment
        . Vibramycin 100mg bid x 7days or E-mycin 500mg qid x 7days or TCN 500mg qid for 7days or Azithromycin 1.0 gm PO (one dose)

G. Non-gonococal urethritis
    0. etiologic agent - Chlamydia Trachomatis, Herpes Simplex, Trichomonas Vaginitis, Ureaplasma Urealyticum

1. signs/symptoms
    . burning on urination
    a. urethral discharge
2. diagnosis
    . urethral culture
3. treatment
    . uncomplicated: Tetracycline 500 mg PO q 6 hrs or Doxycycline 100 mg PO bid for 7 days
    a. complicated: require longer courses - Tetracycline 500 mg PO q 6 hrs or Doxycycline 100 mg PO bid for 21 to 28 days
    b. Pregnancy: substitute E-mycin 500 mg PO q 6 hrs for at least 7 days

HEENT Disorders and Exam

PURPOSE: The purpose of this lesson is to teach the student the proper procedure for examining and recognizing common disorders of the head, eyes, ears, nose and throat.

LEARNING OBJECTIVES:

A. TERMINAL LEARNING OBJECTIVE: Given a simulated patient with simulated symptom; the student will be able to recognize potential problems and perform the needed exam.
B. ENABLING LEARNING OBJECTIVES:
    1. The student will be able to identify different components of the eyes, ears, nose, and throat.
    2. The student will be able to identify different disorders of the eyes, ears, nose, and throat.
    3. The student will be able to identify the signs and symptoms of EENT disorders.
    4. The student will be able to identify the treatment of these disorders based upon exam.
    5. The student will be able to identify the proper techniques for a basic exam of ears, eyes, nose, and throat.
C. The instructor will give this class by lecture and demonstration.
D. This material will be covered on a daily quiz and the final oral exam.

1. Eyes, treatment and diagnosis of ocular disorders.
    a. Review of anatomy
        1. conjunctiva - mucous membrane of the eye.
        2. cornea - protective part of the eye.
        3. iris - regulates quantity of light into the eye.
        4. lens - expands/contracts in order to focus light.
        5. pupil - circular area that allows for the passage of light.
        6. retina - receives images from light and converts them into electrical impulses sent to the brain.
        7. vitreous humor - transparent liquid that gives the eye its shape.
        8. aqueous humor - fluid anterior to the lens that is used in the support of the iris and refraction of the light.
    b. Ocular disorders
        1. Refractive errors
            a. blurred vision
            b. headaches
            c. decreased visual acuity testing
        2. Types of refractive errors
            a. hyperopia - image is focused behind the retina
            b. myopia - image focused anterior to the retina

c. presbyopia - accommodation muscles are unable to focus
d. astigmatism - uneven focusing / displaced lens

3. Treatment objectives
    a. obtain good history (Do they wear glasses/contacts?)
    b. refer to MO if no history of trauma or illness
    c. if positive for trauma, review procedures for various trauma's, refer to MO
    d. do visual acuity in all cases
    e. Refer all <u>unexplained</u> eye pain and/or unexplained changes in visual acuity to MO.
4. Foreign bodies / small non-penetrating
    a. signs/symptoms
        1. complaint of something in eye
        2. tearing or weeping
        3. reddened or bloodshot
        4. foreign bodies (small)
    b. diagnosis/treatment
        1. do VA
        2. complete history
        3. attempt to irrigate
        4. Examine the eye using fluorescein stain for detection of abrasion/laceration/burns/ulcerations
        5. If foreign body is hard to remove, contact MO
        6. If not improved, contact MO
        7. Corneal abrasions and scratches
            a. E-mycin ophthalmic ointment or 10% sulfacetamide sol 2 qtts q 2-3h for 2 days.
            b. Patch eye; nothing on eye except medication, i.e. no contacts.
            c. Follow-up after 24 hours SIQ
        8. Follow-up should include irrigation, VA, and restain check.
        9. If healing, continue treatment for 2 days
5. Inflammation and infection of the eye
    a. conjunctivitis is an inflammation of the mucous membrane of the eye.
        1. bacterial conjunctivitis
            a. signs/symptoms
                1. purulent discharge with edema
                2. conjunctiva will appear red and inflamed
                3. exudate
                4. generally unilated

b. diagnosis, prognosis, and treatment
    1. Usually related to staph, strep, or bacillus infection.
    2. Duration may run 10-14 days without treatment.
    3. Never use eye drops of any kind that contain steroids without permission.
    4. Eye should be kept free of all discharge.
    5. No contacts.
    6. E-mycin ophthalmic ointment QID to affected eye for 3 days.
    7. Check culture results in 24-48 hrs
    8. Follow-up in 3 days
    9. If no resolution or if it worsens then check C&S
    10. Advise pt not to rub eyes or use towels to rub eyes. It can be easily transmitted.

2. Viral conjunctivitis (pink eye)
    a. signs/symptoms
        1. Eyelids may appeared reddened.
        2. Copious amts of watery discharge with scantyexudate.
        3. Often bilateral
    b. diagnosis and treatment
        1. Usually associated with pharyngitis, fever or malaise. Occurs mostly with children.
        2. Usually a week in duration
        3. Pt should abstain from rubbing eyes
        4. Warm water compresses, no contacts.
        5. Sodium sulfacetamide 10% 1-2 qtts q6h X10day
        6. Frequent hand washing to prevent spread
3. Allergic conjunctivitis
    a. signs and symptoms
        1. Eyes may appear reddened
        2. May have itching and tearing
        3. Minimal discharge
        4. May appear chronic or reoccurring
        5. Generally bilateral

b. diagnosis and treatment
    1. Treatment is symptomatic
    2. Normally associated with hayfever, seasonal changes
    3. Vasocon-A can be used

4. Blepharitis - an inflammation of the eyelids.
    a. signs/symptoms
        1. Tenderness, reddening, sore sticky exudate
        2. Eyelids may become inverted & eyelashes fall out
    b. treatment
        1. Antibiotics applied to eyelids
        2. Keep scalp and eyelids clean
        3. Scales must be removed daily with moist applicator or warm, moist wash cloth
    c. 2 Types
        1. ulcerative - usually secondary to bacterial infection
        2. non ulcerative - cause unknown
5. Hordeolum (stye)
    a. signs/symptoms
        1. Localized pain, swelling to eye lid
        2. Often purulent discharge
    b. treatment - Hot compresses, scrub with neutral soap, topical antibiotic eyedrop q3h, and if not resolved in 2-3 days, refer to ophthalmology for I&D

2. EARS
    a. Review anatomy & physiology of the ear
        1. external or outer ear
        2. middle ear
        3. inner ear
    b. History
        1. always ask the following
            a. hearing loss
            b. tinnitus - ringing in the ear
            c. vertigo - sense of motion
            d. otalgia - ear pain
            e. otorrhea - drainage from the ear
    c. Physical exam
        1. As per lecture on physical exams of head and neck.
    d. Common disorder of the ear

1. hearing loss - 2 types
    a. conductive - seen in people with external or middle ear problem
        1. history - Have perceived hearing loss & need things repeated
        2. physical exam
            a. Weber - in conductive hearing loss, sound lateralizes to the affected ear.
            b. Rinne - in conductive hearing loss, bone conduction (BC) > air conduction (AC)
        3. tests
            a. audiogram: normal 0-25 db.
        4. causes
            a. obstruction of external auditory canal (EAC)
            b. T.M. (tympanic membrane) perforation
            c. serous otitis media (SOM)
        5. treatment
            a. Treat underlying problem, i.e. remove cerumen, treat otitis, treat middle ear effusion.
            b. hearing aides if loss is not severe
            c. sensorineural - When the eighth cranial nerve or cochlea are damageInvolves the inner ear.
                1. History - similar to conductive hearing loss.
                2. PE: Weber - lateralizes to good ear Rinne - AC>BC
                3. Audiogram - both BC and AC below 25db in affectedfrequencies
                4. Causes
                    a. noise induced - most common - occupationally involved
                    b. trauma - skull fx (basilar)
                    c. tumors
                5. Treatment
                    a. Hearing conservation; may require baseline adjustment.
                    b. Hearing aides
                    c. Sudden hearing loss.
                        1. Usually unilateral
                        2. Sensorineural hearing loss

3. Causes
    a. perilymphatic fistula
    b. other causes - tumor, infection, environment trauma

d. obstruction
    1. cerumen impaction - PE reveals wax in EAC
    2. treatment
        a. irrigate ear 1/2 water:1/2 hydrogen peroxide
        b. cerumen scoop - use under direct visualization or EAC. **DO NOT USE BLINDLY!!!**
    3. contraindications - no irrigation if pt has a perforation

2. Foreign bodies
    a. Common in young
    b. Objects rough/jagged edged may be irrigated
    c. Do not use forceps
    d. If object is absorbent, do not irrigate. Object may swell
    e. Insect - fill ear with mineral oil. This may kill insect.
    f. Only MO or certified corpsman can remove object
    g. If unable to remove, then ENT consult.
3. Otitis externa
    a. Infection of external ear
    b. Caused by bacteria, fungi, or may be a dermatitis
    c. Common in swimmers

d. Results from wax in ear that absorbs water, macerates the skin & canal, which affords a basis for infection.
e. signs/symptoms
    1. Itching followed by pain.
    2. Eear swollen, pale in color.
    3. Lymphadenopathy in pre-auricular area,post-auricular area or neck.
    4. Pain with movement of auricle.
    5. Discharge may be present.
f. Treatment
    1. mild to moderate
        a. cortisporin otic solution 4 qtts QID
        b. keep ear dry
        c. if ear swollen shut, may need placement of a wick
        d. Tylenol, NSAID's for pain
    2. severe (lymphadenopathy, fever, severe pain)
        a. as above but in addition may require systemic antibiotics (Augmentin or Amoxicillin 500mg TID)
        b. refer to MO
        c. may need narcotic analgesics
    3. try to visualize T.M. to R/O concurrent otitis media or perforated T.M.
    4. Otitis Media (OM)
        a. infection of middle ear
        b. bacterial or viral
        c. most common bacterial
        d. common in children 3 months to 3 yrs
        e. starts as URI. Organisms enter into the middle ear via eustachian tube, swell, become inflammed and eventuallyobstructs. Results in bacteria trapped in the middle ear.
        f. signs/symptoms
            1. otalgia (ear pain)
            2. fever, nausea, vomiting
            3. general malaise
            4. decrease in hearing
            5. may have vertigo
        g. physical exam
            1. T.M. erythematous, edematous, dull, bulging, decreased mobility (use pneumatic bulb or valsalva maneuver)

2. No landmarks, or distorted landmarks.
3. Purulent material behind T.M.

h. treatment
   1. antibiotics - Amoxacillin 250 mg tid x 10days, if PCN sensitive, give Septra D.S. BID X 10 days
   2. Oral decongestants
   3. Analgesics
   4. Recheck in 2 weeks

g. Complications
   1. Serous otitis media - sterile fluid behind T.M., immobility ofT.M. usually treated with decongestants such as Entex LA BI May persist for 4-6 weeks.
   2. Acute mastoiditis - seen about 10-14 days after untreated or poorly treated acute OM. Develops thick, purulent otorrhea, dull post-auricular pain, low grade fever, post-auricular swelling and erythema, displacement of auricle outward, pain most intense over mastoid.
   3. If you see acute OM in elderly pts, must R/O nasopharyngeal cancer blocking eustachian tube and causing OM
   4. Chronic otitis media
      a. T.M. perforation, usually central perforation
      b. mucoid, oderless drainage
      c. acute exacerbation
      d. conductive hearing loss
      e. treatment - irrigate with saline, then dry ear. Cortisporin otic susp. 4qtts QID, & may need oral antibiotics
   5. Cholesteatoma
      a. collection of desquamated epithelial cells in the middle ear
      b. foul smelling discharge
      c. marginal perforation
      d. proteolytic enzymes causes destruction to bone
      e. PE - retracted T.M. with marginal perforation and pearly white material in superior part of T.M.
      f. treatment - mastoidectomy (surgical)

g. causes - eustachian tube dysfunction causes retraction ofT.M.
h. refer to ENT

4. Trauma
    a. traumatic
        1. causes - blunt trauma, explosions, etc.
        2. Treatment - refer to MO or ENT
            a. Secondary to foreign body - ear should be cleaned and suctioned. Avoid ear drops. Perforations will heal spontaneously. Follow-up in 1-2 weeks. If not healed, refer to ENT.
            b. blast injury
                1. refer to ENT
                2. May have hearing loss & most will complain of pain
5. Eustachian tube dysfunction
    a. Fullness in ear, loss of hearing, T.M. retracted
    b. Decongestants may help

3. The Nose
    a. Review anatomy
    b. Common disorders
        1. Epistaxis (nose bleed)
            a. Kiesselbach's plexus - located anterior septum, supplied by four arteries
            b. Usually bleed from one nostril
            c. Most nose bleeds are anterior
            d. Causes - trauma, foriegn body, etc.
            e. PE & TX:
                1. Use nasal speculum and light to see bleeding and location
                2. May use cautery to stop bleeding (silver nitrate stick for nose cautery). May apply bacitracin-ointment to nares TID after cautery.
                3. Have pt sit straight up and pinch nostrils for 5 minutes
                4. If not stopped, use nosepack (1/4 gauze with bacitracian-ointment). Have them return to clinic next day.
                5. If bleeder not seen and pt complains of blood running down throat, may be a posterior nose bleed.
                    a. Need referral to ENT for nasal pack, and admission to ICU for airway watch.

b. Posterior nose bleeds not caused by trauma, seen more In elderly
c. If bleeding continues, surgery may be needed.

f. other causes
1. If chronic, get good family history
2. May have bleeding disorder
3. Labs - pt/ptt, cbc with platelets, bleeding time
4. Check BP
5. Dry environment may cause epistaxis
a. Nasal mucosa becomes brittle and bleeds easily
b. Use ocean spray mist (NACL) 2 sprays to ea nostril q4-6hrs or ointment for moisturizing effect.

c. Acute sinusitis

1. Inflammation of paranasal sinuses by bacteria, viruses, or fungi
1. Accompanied by or follows colds
2. signs/symptoms

a. pain over affected sinus
b. headache
c. purulent rhinorrhea
d. fever and other systemic disease
4. physical exam
. Mucosa is hyperemic and edematous
a. Turbinates are enlarged and often about the septum
b. Purulent drainage
c. Pain elicited from pressure over involved sinuses
d. Transillumination may reveal air-fluid level.
5. sinus X-rays
. Four views - Caldwells, Water's, lateral & base.
a. See air-fluid level in involved sinus or may just be clouded.
b. Not required for diagnosis; more useful in chronic cases.
6. treatment
. Augmentin 500mg TID X 14-21 days
a. Entex LA
b. Topical vasoconstrictors/decongestants (Afrin) for 3 days only.
c. Analgesics
d. Avoid antihistamines

7. If frontal sinusitis, or if diagnosed by X-ray, consult ENT doctor, as IV antibiotics and hospitalization may be required (could develop into brain abcess).

8. complications

. periorbital cellulitis
a. orbital cellulitis
b. orbital abcess
c. cavernous sinus thrombosis
d. intracranial abscess
e. sinus mucocele
f. osteomyelitis

C-2. Chronic sinusitis

Irreversible tissue changes have occurred in lining membrane of one or more of the paranasal sinuses, mucosal thickening becomes apparent.

0. Causes - repeated bacterial sinusitis
1. signs/symptoms
   . Purulent material in nose. Enlarged turbinates.
   a. Similar to acute sinusitis.
   b. Should not have pain or headache
2. physical exam
   . Purulent material in nose. Enlarged turbinates.
   a. May notice nasal polyps
3. X-rays
   . Sinus series
4. Treatment
   . Treat like acute sinusitis
   a. Antral lavage with culture of turbinates
   b. May require ENT referral if recurrent or refractory
   c. Rhinitis

C-3. Allergic (hay fever)

5. seasonal or perennial
   . sneezing, lacrimation, itching, nasal discharge etc.
   a. must obtain good history; key to diagnosis.
   b. caused by pollen, grasses, dust/house mites etc.
   c. c/o frontal headache
   d. trouble breathing through nose
6. physical exam
   . pale mucosa
   a. turbinates (inferior) enlarged
   b. clear/thin secretions
   c. possible deviated septum
   d. nasal polyps
7. labs/allergy testing (in severe cases)

. intradermal allergy testing
a. rast test (blood test)

8. treatment
. avoidance of allergen
a. nasal steroid inhaler
b. antihistamine
c. may use topical vasoconstrictor

C-4. Acute Rhinitis

9. common cold
. cause - rhinovirus
a. signs/symptoms - fatigue, sore throat, nasal discharge, headache, fever, nasal obstruction, sneezing
b. physical exam
c. nasal mucosa red
d. inferior turbinates enlarged and erythematous
e. clear watery discharge
f. treatment - symptomatic

C-5. Foreign body

10. common in younger children
. foul smelling, bloody, unilateral discharge
a. consult MO or ENT for removal

C-6. Trauma

11. nasal fracture
. result of blunt trauma
a. signs/symptoms

1. epistaxis, nasal dyspnea, edema, pain, ecchymosis.

g. physical exam - crepitus, mobile nose, deviation, edema, ecchymosis. Must look into nose to R/O septal hematoma. If found, refer to ENT.
h. Look for and rule out other facial fractures.
i. X-rays of little valve
j. treatment - reduction, anesthesia, Denver splint, antibiotics if open Fx, refer to MO or ENT.

9. Blow out fracture
. When force is applied to the orbit causing contents to spill either medially or inferiorly. If inferiorly, will end up in maxillary sinus.
a. signs/symptoms

0. epistaxis
1. enophthalmus
2. entrapment
3. dypesthesia
4. diplopia

b. fracture over infraorbital rim
c. X-rays needed; CT scan is definitive.
d. If there is entrapment of EOM, need surgery soon otherwise must wait5-7 days
e. Must R/O ocular injury
f. refer to ENT

4. Throat

. pharyngitis - inflammation of pharynx

0. causes
   . viral - Epstein-Barr virus (mono), adenovirus, etc.
   a. bacterial - group A & B strep
1. signs/symptoms
   . odynophagia
   a. sore throat
   b. dysphagia
   c. fever, fatigue, otalgia
2. physical exam
   . tender anterior cervical adenopathy
   a. erythmatous posterior pharynx
   b. exudate
   c. palatal petechiae
3. differentiation
   . throat C&S
   a. severe symptoms suggest bacterial etiology
4. Often have concurrent tonsillitis
5. Treatment
   . throat C&S
   a. Pen V-K 500 mg QID x 10 days
   b. increase/force fluids, analgesics

a. Tonsillitis - inflammation of tonsils.

0. causes - similar to pharyngitis
1. signs/symptoms - more odynophagia and dysphagia due to increase of tonsil size.
2. Physical exam - similar to pharyngitis.
   . tonsils enlarged, red, and exudate (white patchy)
   a. palatal erythema and edema
   b. cervical nodes may be tender, usually palpable
3. treatment - similar to pharyngitis
4. tonsillitis rare without pharyngitis but can have vice-versa

b. Peritonsillar abcess
    0. abcess of peritonsillar region, pus within surrounding tissues
    1. signs/symptoms
        . hot potato voice
        a. trismus - inability to open mouth fully
        b. increased odynophagia
        c. foul odor from mouth
        d. unilateral pain
    2. physical exam
        . uvular deviation
        a. tender over anterior fauces arch
        b. tonsils red, swollen
        c. protuding and flunctuant on one side
    3. treatment
        . I&D of abcess, ENT consult
        a. antibiotics - Cleocin 300mg TID x 10 days to cover anaerobic bacteria

5. Larynx
    . Review anatomy
    a. Laryngitis
        0. Signs/symptoms
            . hoarsness
            a. aphasia
            b. pain in larynx
            c. coughing attack
        1. Physical exam - indirect (mirror) laryngoscopy reveals vocal cords to be red and swollen
        2. Treatment - symptomatic; voice rest, vaporization, do not whisper, antibiotics rarely needed.
6. Special Topics

. Otalgia
    0. Ear pain caused by other than infection.
    1. Temporomandibular joint (TMJ) dysfyunction
        . often causes ear pain located pre-auricular
        a. often hear pop, click, or crepitus in joint
        b. physical exam - palpate TMJ by putting finger in ear and pressing anteriorly. Have pt open and close mouth.
        c. treatment
            1. Motrin
            2. soft, mechanical diet
            3. warm compresses
            4. refer to ENT
    2. Cancer to head and /or neck

. Cancer of oral cavity (CNV), base of tongue (CNIX) or (CNX). Can have referred pain to ear.
a. Obtain good history of smoking, radiation, change in voice or hoarseness.
b. Refer to ENT

a. Vertigo
0. Sense of motion - not the same as dizziness must differentiate between the two.
1. Causes
. External & middle ear - impaction or foreign body
a. Inner ear and CNS
1. benign positional - caused by otoconia that trigger cells in the vestibular sense organ
2. perilymphatic fistula
3. acoustic neuroma
4. acute suppurative labyrinthitis - bacterial infection of inner ear causes permanent hearing loss.
5. vestibular neuronitis - viral infection of inner ear. No permanent hearing loss.
6. Meniere's disease - triad of low frequency hearing loss, vertigo and tinnitus.
7. Vestibulobasilar insufficiency - seen in elderly patients, AJD of cervical spine can impinge vertebral artery.
2. Tests
. MRI< EMG< brain stem evoked potentials

b. Neck Mass (differential diagnosis)
0. lymph node
. if node is tender, its reactive from an infection
a. non-tender, rubbery, hard, R/O neoplasm
b. over 50% of lymphadenopathy is unknown
c. give 2 weeks course of antibiotics
d. if not resolved in 2 weeks, refer to ENT for further work up
1. epidermal inclusion cyst, dermoid cyst, lipoma
2. 0-15 age, inflammatory - congenital - neoplasm (malignant-benign)
16-40 age, inflammatory - congenital - neoplasm - (benign-malignant)
40 & up - (neoplasia) malignant - benign - inflammatory - congenital

c. Human and animal bites of head and neck.
0. Human bites are more dirty than animals.
1. Irrigate with saline and betadine (1:1) use jet stream irrigation.

2. Clean non-human bites can be closed primarily if seen in 5 hrs or less.
3. Human bites closed in a delayed manner. Use wet to dry dressing changes for 2-5 days then close primarily.
4. Treat avulsions with delayed manner.
5. Antibiotics - oral, Augmentin 500mg TID x 14 days. IV Timentin 3.1g q6hrs
6. Refer all bites to MO or ENT.

Immunizations

LTG #

Allotted lesson time:

References:

Terminal Learning Objectives: Given the need to perform immunizations and conduct shot call, the student will be able to do so according to proper procedure.

Enabling Learning Objectives:

1. Be able to identify different classifications of immunizations.
2. Be able to identify different immunizations.
3. Be able to identify dosages of different immunizations.
4. Be able to identify side effects and contraindications of different immunizations.

1. Introduction
    A. Purpose of immunization
        1. Prevention of infection and serious disease.
        2. One way to accomplish this is by exposure to biological material to stimulate the production of antibodies.
        3. To prevent infection, you give antibodies.
2. Live attenuated virus vaccine.
    A. Most live attenuated virus vaccines are made from viruses grown in chicken embryo or egg cultures.
        1. They should not be given to anyone who:
            a. has allergies to eggs
            b. history of angioedema
            c. anaphylaxis to eggs
            d. immunocompromised persons
        2. All live viruses can increase risk for heat injury after administration.
        3. Live viruses require special handling. They must be kept in a frozen state (at or near zero degrees Celsius).
    B. Yellow fever
        1. occasionally fatal
        2. transmitted by mosquitoes (Adeis egypti)
        3. 3-6 day incubation period

4. signs/symptoms
    a. headache
    b. fever
    c. epistaxis
    d. backache
    e. nausea/vomiting
    f. hematemesis
    g. jaundice
5. The vaccine
    a. Must be used **within one hour of reconstitution** and the vial and syringes must be destroyed.
    b. Dose is 0.5 cc injection SC or IM with a booster every 10 years.
    c. Given to alert forces and personnel who must travel to endemic areas.
    d. Reactions (normal sensitivity) include mild fever 7-14 days after administration, headache, malaise, & myalgias.

C. Smallpox
1. disfiguring
2. sometimes fatal
3. signs/symptoms:
    a. sudden onset
    b. fever
    c. malaise
    d. headache
    e. backache
    f. abdominal pain
    g. rash 2-4 days after exposure
4. The vaccine
    a. Given only upon BUMED authority
    b. Dose is one deep using bifurcated needle to create multiple punctures to the skin.
    c. Requires vaccination site care.
    d. Reactions include:
        - lymphadenopathy
        - post vaccinial encephalitis
        - progressive vaccinia
    e. Do not give to patients with skin diseases such as eczema.
    f. Requires follow up at one week to ensure proper response.

D. Oral polio
1. Used to protect against polio.
2. Signs/symptoms
    a. malaise
    b. headache

c. G.I. disturbances
d. neck and back stiffness
e. in severe cases, paralysis

3. The vaccine
   a. basic series - consist of 3 doses: (if previously unvaccinated)
      1. 2 gtts by mouth
      2. 2 ggts by mouth 6-8 weeks after first dose
      3. 2 gtts by mouth 1 year later
   b. For previously vaccinated persons, the dose is a one-time dose of 2 gtts
   c. Should not be given to people with a febrile illness.
   d. Not contraindicated in pregnancy
   e. Reactions are rare, but include a neurologic disease simulating paralytic poliomyelitis.

E. Mumps, Measles, Rubella (MMR)
   1. A combination of attenuated vaccines.
   2. Mumps, measles, and rubella have various signs and symptoms:
      a. headache
      b. malaise
      c. anorexia
      d. coruza
      e. cough
      f. conjuctivitis
      g. rash
   3. The vaccine:
      a. Should never be given in pregnancy.
      b. Is given to recruits not previously immunized twice.
      c. Dose is 0.5 cc SC or IM
      d. Reactions include fever up to 5 to 10 days post immunization.

F. Adenovirus
   1. Flu-like illness
   2. Can be spread in epidemics
   3. The vaccine
      a. Prevents disease from adenovirus types 4 &7.
      b. Contraindicated in pregnancy.
      c. Dose is 1 tablet by mouth
      d. Should be separated from other immunizations by at least one month.

3. Killed virus and virus protein vaccines
   A. Rabies - invariably fatal acute encephalomyelitis caused after exposure to an affected animal.

1. There is one killed virus vaccine derived from human diploid cell culture (Imonax).
2. Indicated after suspicious bites along with rabies immune globulin (Hyperab or Imogan)
3. Dosage, given IM to deltoid; found in BUMEDINST 6220.6

B. Influenza
   1. Epidemic febrile disease caused by many different strains of the flu virus.
   2. Vaccine varies each year and depends on virus strains likely to cause disease during the flu season.
   3. The vaccine should be
      a. given annually
      b. NOT to be given to those with egg allergies!!
      c. dosage varies, but is given IM or SC
      d. to be given alone
      e. Reactions include: local pain and swelling, fever, headache, malaise, & myalgia.
      f. Pt should be given heat stress precautions.

C. Hepatitis B
   1. Causes a variety of clinical pictures from asymptomatic infection to fulminating disease and death. Can be transmitted sexually.
   2. Signs/symptoms
      a. myalgia
      b. malaise
      c. nausea
      d. diarrhea
      e. fever
      f. jaundice
   3. Two vaccines exist for hepatitis B:
      a. Recombivax HB
      b. Energix - B
   4. The vaccine should:
      a. Given IM to deltoid
      b. Doses are 1.0 cc for first injection; 1.0 cc one month later, and 1.0 cc six months after first dose
      c. Indicated for health care workers, sexual partners for chronic carriers.
      d. For exposures, hepatitis B immune globulin should be given in addition to Heptavax or Recombivax.
      e. Reactions - site soreness, fatigue, weakness, headache
      f. Serologic prescreening may be indicated because of the high cost of vaccines.

4. Killed Bacteria Vaccines

A. Killed bacterial vaccines are the vaccines that give the largest number of side effects after injection.
    1. They are made from bacterial cultures that have been killed and suspended in solution.
    2. They all increase risk of heat injuries for up to two weeks after injection.
    3. side effects:
        - fever
        - myalgia
        - site soreness
        - swelling
        - localized lymphadenopathy
        - malaise
        - headache
    4. Do not use jet injectors
    5. May be given with other vaccines.

B. Typhoid - an infection caused by salmonella typhi characterized by fever, headache, malaise, rose spots on the trunk, enlarged lymph tissues and diarrhea.
    1. Two forms of the vaccine are available. One is a live attenuated oral and the other is an injection.
        . Injection
            0. series consist of 2 shots given 4 or more weeks apart.
            1. dose is 0.5 cc IM or SC
            2. Booster every 3 years and is 1 dose.
            3. Required for all alert forces.
    2. Oral (tyzla)
        . Indicated for people with severe reactions to injectable vaccine.
        a. May be used for all personnel.
        b. Must be kept refrigerated.
        c. Initial dose is 4 capsules taken on alternate days with cool liquids no more than 37 degrees C.
        d. Booster is given every 5 years and consist of repeating the 4 dose initial series.

C. Plague
    1. severe, often fatal disease
    2. Caused by Yersinia pestis transmitted by the bite of an infective rodent flea.
    3. Signs/symptoms
        . high fever, mental confusion, delirium, coma
        a. shock
        b. petechial hemorrhages

4. The vaccine:
    . Basic series is first dose of 1.0 cc IM followed in 2-4 weeks by 0.2 cc IM. This is followed in 6 months by 0.2 cc IM.
    a. Basic series is required when entering a high risk area. Re-immuize with 0.2 cc IM every 6 months.
    b. IM Only
    c. Basic series is no longer required per BUMEDNOTE 6230.12.

D. Cholera - an acute intestinal infection caused by vitro cholera.
1. It is characterized by:
    . sudden onset
    a. vomiting
    b. profuse watery stools
    c. rapid dehydration
    d. acidosis
    e. collapse
2. The vaccine has a low seroconversion rate and is no longer recommended by the World Health Organization.

E. Pertusis - (whooping cough) an acute, highly contagious infection of the respiratory tract. It is caused by Bordella pertusis.
1. Serious in children, mild in adults.
2. A killed suspension of B-pertusis is part of the DPT shot given to children and is responsible for most reactions.
3. The pertusis vaccine
    . Started at 8 weeks
    a. Combined with Diptheria and tetanus toxoids, DPT 3 doses at bimonthly intervals
    b. Boosters given at 18 months and 4 years of age.
    c. Dose is 0.5 cc IM or SC for each shot.

5. Toxoids

A. Immunity to tetanus and diptheria is related to the level of antibodies to the toxins produced.
1. A modified toxin that does not cause illness is called a toxoid and is used to stimulate the body to produce antibodies that work against the toxin.
2. Toxoid, are often given together.
3. The main shots used are:
    . Combined diptheria, pertusis, tetanus (DPT) given to children.
    a. Diptheria, tetanus, pediatric (DT) used in children who cannot be given pertusis.
    b. Tetanus, diptheria, adult (TD) given to persons 7 years of age for normal booster shots.

c. Diptheria toxoid (D) given only to children who have contraindications to combined preparation.
d. Tetanus toxoid (T) given as a booster shot when diptheria not indicated

B. Tetanus: caused by Clostridium tetanus a bacteria that produces a neurotoxin.
1. symptoms:
. spasms of jaw muscles (lockjaw)
a. stiffness of neck, back, and abdominal muscles
b. muscle contractions
2. History of skin wounds is common. 2/3 of all US cases come from puncture wounds of the hands and feet.
3. The vaccine:
. Dose is 0.5 cc IM
a. Basic series given as part of DPT as child, but in an unimmunized person: one shot followed in 4-6 weeks by second shot, followed in 6-12 months by third shot.
b. Booster is every 10 years
c. May be given if medically indicated for injury.
d. Increased wounds for risk are - old, dirty wounds, puncture wounds, animal bites, wounds with jagged edges.
e. Reactions are rare, usually limited to injection site soreness.

C. Diptheria - acute upper respiratory infection or skin infection, produced by Corynebacterium diptheria.
1. The toxin is absorbed and causes destruction of epithelium and an inflammatory response.
2. Results in grayish pseudomembrane commonly found over tonsils, pharynx or larynx.
3. Tropical form that is responsible for jungle sores.

6. Bacterial Component Vaccines
A. Pneumovax 23 and pnu-immune 23 are the trade names of a vaccine made from a mixture of highly purified capsular polysaccharides from the 23 most common or most invasive pneumococcal types.
1. Used to protect against pneumococcal pneumonia, meningitis and otitis media.
2. The vaccine:
. Used in persons over 2 years old who are at risk.
a. Those at risk include individuals without a spleen; chronic renal, respiratory, or cardiac disease.
b. over 50 years old
c. dose is 0.5 cc IM or SC
d. booster shot is contraindicated
e. reactions include injection site pain and rarely fever, malaise, or myalgia.

B. Hemophilus influenza - used to protect against hemophilus, influenza subtype B infection, the most common cause of bacterial meningitis and a leading cause of serious systemic illness in young children in the U.S.
    1. The vaccine
        . Is recommended for all children between 18 months and 5 years old.
        a. Dose is 0.5 cc IM or SC and is repeated at 4 & 6 months.
        b. Boosters are given at 12-15 months
        c. Reactions are rare
        d. Recently approved vaccine includes the hemophilus, diptheria, tetanus and pertusis.

Shot Call

1. ACLS person (usually a medical officer) and at least one BCLS qualified provider must be present.
2. Ambulance on call with response time of 8 minutes or less.
3. A defibrillator and spark kit should be available.
4. Persons who administer must be trained in:
    a. procedure
    b. proper use and maintenance of equipment
    c. indications and contraindications
    d. storage requirements
    e. management and reporting of adverse reactions
    f. immunization record maintenance
5. Patients who report to shot call should be:
    a. screened for chronic/acute illness
    b. screened for pregnancy
    c. screened for medications that might interact with immunizations
    d. screened for allergies
    e. Offered Tylenol or aspirin to minimize local and systemic shot reactions.
    f. observed for at least 15 minutes after administration for symptoms of anaphylaxis

Your Command: Student Handout, Laboratory

GAIN ATTENTION: During normal routine the CA will be called upon to order, read, and possibly perform various lab tests.

PURPOSE: The purpose of this lesson is to familiarize the student with lab requests, functions of the lab test, and values of the lab results.

INTRODUCE LEARNING OBJECTIVES:

A. TERMINAL LEARNING OBJECTIVE: Given the need to order, read or perform a lab test, the student will be able to do so according to proper procedure.
B. ENABLING LEARNING OBJECTIVES:
    1. Be able to select the correct values for lab test by selecting the correct response.
    2. Be able to select the correct lab test for different disorders by selecting the correct response.
    3. Be able to select the different enzymes and their values by selecting the correct response.
C. The instructor will give this class by lecture and demonstration.
D. This material will be covered on a daily quiz and the final oral exam.

Complete Blood Count (CBC)

A. Red Blood Cells (RBC's), *Erythrocytes*
    1. RBC'c are the oxygen carrying cells of the blood. The normal range is 5.0 (**4.5-6.0**) x 10^6 cells/cc for males and 4.5 (**4.0-5.5**) x 10^6 cells/cc for females.
    2. Mean Corpuscular volume (MCV) is a measure of the size of RBC's. Normal is **80-100**.
    3. An anemia is a condition of decreased oxygen carrying capacity in the blood caused by a decreased number of RBC's. Anemias are classified according to the size of the RBC's.
        i. Microcytic anemia:*(MCV < 80)* Found in chronic blood loss, iron deficiency, lead poisoning, chronic infection and in inherited anemias.
        ii. Normocytic anemia:*(MCV 80-100)* Found in sudden blood losss, hemolytic anemia, pregnancy, chronic disease, G6PD deficiency and other conditions.
        iii. Macrocytic anemia:*(MCV > 100)* Is noted in B12 deficiency, folate deficiency, leukemias, and in liver and thyroid disease.

iv. The most common cause of anemia in our population is acute and chronic blood loss and the inherited anemias. All anemias should be referred to a Medical Officer.

4. The term for increased RBC's is polycythemia, and can be caused by living at high altitudes, vigorous exercise, use of anabolic steroids, a blood condition called polycythemia vera and others.
5. Hematocrit (HCT) is the volume of the RBC's expressed as a percent of the volume of whole blood. Normal range in males is 45% (**45-52%**) and in females 40% (**36-47%**). HCT is determined by placing a drop of blood in a capillary tube and spinning it in a centrifuge. It can also be calculated by automated counter from the relationship HCT = MCV x RBC's.
6. Hemoglobin (Hgb) is the iron containing pigment of the blood. Normal range in males (**14-18%**) and in females (**12-16%**). Its function is to carry oxygen from the lungs to the tissue.
7. Rules of three: When evaluating RBC, Hgb, and HCT remember that: RBC x 3 = Hgb, and Hgb x 3 = HCT. If the numbers do not follow this rule, *i.e. RBC is 5, Hgb is 10 and HCT is 45 then there is a lab error.*
8. Keep in mind that lab values may vary from place to place depending on the equipment used.

B. White Blood Cells (WBC's), *Leukocytes*

1. WBC's are the cells involved in fighting infection and in inflammation. The normal range for adults is 4500-11000 cells/mm^3. Blacks tend to have lower WBC's than Whites.
2. The causes of increased WBC's are many, but included are bacterial infections, acute inflammatory disorders (e.g. rheumatoid arthritis), metabolic disorders (e.g. diabetic acidosis), stress, tissue breakdown (e.g. burns), drugs, toxins, and others.
3. The causes of decreased WBC's are also many but include some bacterial infections such as influenza, protozoa infections such as malaria, chemical and physical agents such as radiation and others.
4. There are several types of white blood cells which may be distinguished when stained by Wrights Stain on a microscope slide. This is called a differential and is helpful to identify the cause of an abnormal WBC total count.
    i. Segmented neutophils are WBC's that have nuclei that are segmented. They normally comprise 40-60% of the WBC's in a differential.
    ii. Band neutrophils are WBC's that have a band-like or horseshoe shaped nuclei. Normal range is 0-3% of the differential. They are an early form of segmented neutrophils.
    iii. Lymphocytes are WBC's with clear sky blue cytoplasm, scanty, with few unevenly distributed granules with a halo around them. Normal range is 10-35%.

iv. Monocytes are the largest normal WBC's. Its color resembles that of a lymphocyte, but its cytoplasm is a muddy grey-blue. Normal range is 4-8%.
v. Eosinophils are characterized by numerous coarse, reddish-orange granules in the cytoplasm which are lighter colored than the nucleus. Normal range is 1-3%.
vi. Basophils are characterized by scattered large, dark-blue to purple granules, which are darker than the nucleus. Normal range is 0-1%.
vii. The differential is usually written as a series of numbers that add up to 100% in the following order: segmented neutrophils, bands, lymphocytes, monocytes, eosinophils, basophils. Thus a normal differential might be: *55 / 3 / 35 / 5 / 1 / 1*. Normal differential might be: *80 / 10 / 9 / 1 / 0 / 0*. Notice that the numbers are moving to the left of the series, which is where the term "left shift" comes from when describing differentials. A left shift is viewed as evidence of infection, especially bacterial infection.

C. Platelets
1. Platelets are small, round cells that can be seen on a microscope slide and are important in blood coagulation. The normal range is 200,000-500,000 cells/mm^3. There is a tendency to bleed or bruise easily when the platelet count falls to 20,000-50,000 cells/mm^3.

Urinalysis (UA)

A. Dipstick test. A number of tests may be performed by dipping a chemical analysis strip into a cup of urine and reading the color coded patches against the references on the strip bottle.
1. Specific gravity is the weight of a liquid compared with an equal volume of water. Water is represented by 1.000. Normal range is 1.010-1.030. A higher concentration is a sign of dehydration.
2. PH is the measure of hydrogen ions in solutions. H_2O is neutral and has a PH of 7. Urine is normally acidic with a PH of 5 to 7.
3. Glucose should not be present in normal urine.
4. Ketones should not be present in normal urine.
5. Protein is sometimes present in trace amounts in normal urine.
6. Occult blood should not be present in normal urine. *Note: If positive and the microscopic is negative for RBC's it is generally because of release of myoglobin from muscle breakdown.*
7. Urobilinogen is sometimes present in trace amounts in normal urine.
8. Leukocyte Esterase: an enzyme found in neutrophils. Should be negative.

B. Microscopic: seldom done on a routine UA unless the dipstick is positive.
1. *Epithelial cells*: a few of these cells may be seen in a normal sample, but many epithelial cells may mean the sample is dirty and not collected properly.

2. *WBC's*: 1-3 cells per high power field may be seen in normal sample. The presence of WBC's indicates infections or inflammation involving the urinary tract.
3. *RBC's*: 0-2 cells per high power field may be normal prostate hypertrophy, tumors, and other conditions. A common cause of microscopic hematuria in our population is excess exercise, particularly running and humping.
4. *Bacteria*: rare bacteria may be seen, but many bacteria with WBC's indicates infection.
5. *Casts*: 0-1 hyalin per cast per lowe power field may be normal, but other casts are abnormal nad indicate kidney disease.
6. *Crystals*: may also be seen in normal urine.

C. Collecting and Processing
   1. Routine urinalysis requires a random sample. An early morning sample is preferred: a first void when evaluating for sexually transmitted disease: a midstream when evaluating other conditions.
   2. A specimen should be analyzed within two hours of collection. If a specimen is left standing it will become alkalinized, and not suitable for culture, RBC's if present will decompose and urine casts if present will disintegrate.
   3. When a 24 hour urine collection is needed, patients should be told to urinate in the morning in the toilet first, then for the rest of the day collect the urine in the container. The next morning they should urinate into the container and bring the sample to the lab. Normal volume is 1000-1600 cc/day.

Chemistry Test

A. Chemistry tests are commonly ordered as groups of tests such as SMA-6, SMA-12, liver function tests (LFT's), and chemistry panel. The tests that are actually included in these groups varies from lab to lab.
B. Electrolytes
   1. Sodium is an important ion that acts to preserve a balance between other ions such as calcium and potassium to maintain normal heart actions and equilibrium of the body. Normal range 136-145 mmol/L.
   2. Potassium is essential for normal excitability of muscle tissue, especially heart muscle. It also plays a role in the condition of nerve impulses. Normal range 3.5-5.0 mmol/L.
   3. Calcium is used by the body for bone growth, blood coagulaiton, and nerve, mucsle and heart function. Normal is 2.2-2.6 mmol/L. (9-10.5 mg/dL)
   4. Chloride is the predominant negative ion in plasma. Normal range 98-106 mmol/L.
   5. CO2 is the sum of the concentration of bicarbonate and carbonic acid in plasma. Normal range 21-30 mmol/L.

6. Phosphate is a negative ion involved in bone metabolism and energy production. Normal range is 1.0-1.4 mmol/L. (3-4.5 mg/dL)
7. Electrolytes are ordered for a wide variety of reasons including kidney disease, dehydration, GI disease, heart disease, metabolic disease, etc.

C. Renal Function Tests
1. Blood Urea Nitrogen (BUN) is a measure of nirtogen in the blood as urea, a breadkown product of proteins. Normal range 3.6-7.1 mmol/L. (10-20 mg/dL)
2. Creatinine is the end product of creatine metabolism and is excreted by the kidney. Normal range < 133 mmol/L. (<1.5 mg/dL)

D. Liver Function Test
1. Alkaline phosphates is an enzyme found in liver, bone, intestine and placenta that is increased with liver disease. Normal range is 30-125 mu/ml.
2. SGOT (AST), Serum Glutamic-oxaloacetic Transaminase, is an exzyme found in many tissues, but in highest concentration in the liver and heart. Injury of either causes release of the enzyme into the blood. Normal is less than 40 units/liter.
3. SGPT (ALT), Serum Glutamic-pyruvic Transaminase is found more specifically in the liver. Normal is less than 40 units/liter.
4. Bilirubin is a yellowish pigment that is a breakdown product of hemoglobin and is Processed and excreted by the liver. Increased blood breakdown or liver disease or obstruction will cause bilirubin to rise above normal 0.3 to 1.0 mg/dL. When bilirubin reaches between 2 to 4 the sclera and the skin become tinted yellow.

E. Others
1. Glucose is used as the primary source of energy for the body. Normal range is 65-120 mg/dl.
2. Total protein is the sum of the circulating proteins in the serum and is difficult to interpret without knowledge of the individual fractions. Normal range 6.0 to 8.5 g/dl.
3. Albumin is a protein made in the liver. It is decreased in liver, kidney, GI, and chronic disease and malnutrition. It is increased in dehydration. Normal range 3.5 to 5.0 g/dl.
4. Globulin is the other major protein in the serum. Globin composes most of the fraction of total protein that is not albumin.
5. Uric Acid is an end product of uricotelic metabolism. Normal range is 2.5 to 8.0 mg/dl in males and 1.5 to 6.0 mg/dl in females.
6. CPK, or creatine phosphokinase, is an enzyme present in skeletal and heart muscle, and is increased in muscle breakdown and heart attacks. Normal is 25 to 235 u/liter.
7. LDH, lactate dehydrogenase, is an enzyme present in various tissues and serum which is important in the exidation of lactate. Normal range is 100 - 225 u/liter.

F. Lipids
    1. Cholesterol is a fatty substance in the blood. High levels of cholesterol are associated with coronary atherosclerotic disease and varies with age. A value of cholesterol greater than 200 mg/dl for any age group is abnormal.
    2. Triglycerides are the other magor fatty substance in the blood, and should be measured on a patient who has fasted for 12-24 hrs. He/she may drink all the water they wish. Normal is 10-140 mm/dl.

Cultures (C&S)

A. Urine culture: Patients should be given a sterile urine cup and instructed as follows:
    1. First morning specimen: wash hands thoroughly, wash penis or vulva with downward strokes, start to urinate into the toilet, stop and position container and take sample, screw on cap without touching inside rim, take to lab immediately. A positive culture grows bacteria CFU > 10^4/cc of urine.
B. Gonorrhea culture: Specimen may be obtained from the cervix, vagina, urethra, rectum, throat or joint fluid. Specimens are cultured on Thayer-Martin medium.
    1. Samples from the urethra in males are obtained as follows: do not collect until at lest one hour after last urination, collect discharge directly or from discharge obtained by "milking" the urethra, if no discharge is abailable, insert an unmoistened thin swab into the urethra approximately 2 cm and gently rotate it.
    2. Another approach to obtaining a specimen in an asymptomatic male, which is not embarrassing to the patient, is as follows: collect a first void (not midstream) urine specimen and send to the lab for GC gram stain and culture of sediment.
C. Throat culture: The most common bacterial cause of pharyngitis is group A beta hemolytic streptococci. Patients with pharyngitis are at an increase risk of acute rheumatic fever and post streptococcal glomerulonephritis.
    1. Obtain a specimen before starting antibiotics.
    2. Depress the tongue to expose the pharynx. Use a culturette or sterile cotton swab. Rub the swab vigorously over the posterior pharynx and tonsils, avoiding the tongue, uvula and buccal mucosa.
D. Stool cultures: Should be obtained in any patient with diarrhea lasting longer than two (2) days, diarrhea with high fever, bloody or mucous containing diarrhea or diarrhea in moderately to severely ill patients. Rectal swabs, culturettes or fresh stool samples should not be refrigerated and should be delivered to the lab in less than four hours.
E. Wound and abcess cultures: Should be obtained from the edges of wounds and abcesses. The center of abcesses are generally sterile.
F. Blood cultures: Usually obtained in very ill patients with fever of unknown origin and in other clinical situations.

G. Sputum culture: Should be obtained when the patient suspected of pneumonia has a productive cough. Early morning samples are best, and a gram stain should be ordered on the same sample. A significant number of epithelial cells indicate the sample is probably saliva and not sputum.

KOH Prep

A. A KOH Prep is used for the diagnosis of fungal ingection. Samples should be taken at the edge of the skin lesions and placed on a microscope slide with a couple of drops of KOH. The KOH dissolves all the cells except fungal cells, making them easier to see under the microscope. Fungal elements appear as branching structures looking like bamboo, sometimes with small buds.

FINAL NOTE: Although "normal" values have been quoted above, all normal laboratory values vary from lab to lab.

Male Genitalia

Allotted Time:

References:

Instructional Aids:

Terminal Learning Objective: To recognize potential problems and perform the needed exam.

Enabling Learning Objective:

1. Identify different components of the male genitalia.
2. Identify disorders of the male genitalia.
3. Identify disorders of the anus and rectum.

A. Penis
    1. Inspection
        a. skin: obvious scars, lesions, etc.
        b. foreskin: retract foreskin to detect chancres, carcinoma.
            1. Smegma: cheesy white material, accumulates under the foreskin. Sign of poor hygiene.
            2. Phimosis: tight prepuce that can not be retracted.
            3. Paraphimosis: tight prepuce that can be retracted but gets caught behind the glans and cannot be returned.
        c. Glans
            1. ulcers
            2. balanitis: inflammation of the glans
            3. balanoposthitis: inflammation of the glans and prepuce
        d. Base of penis
            1. excoriations
            2. check pubic region for nits, lice (crabs).
        e. Urethral Meatus:
            1. location
            2. hypospadias: Meatus displaced to inferior surface.
            3. epispadias: Meatus displaced to superior surface.
    2. Urethral Discharge
        a. Compress glans between thumb and index finger to express material.
        b. Gonococcal urethritis: usually profuse and yellow.
        c. Non-gonococcal urethritis: scanty, white or clear.
        d. Gram stain discharge.
    3. Palpation

a. Palpate shaft of penis between thumb and first two fingers.
b. Replace prepuce if retracted.
c. Note presence of induration.

B. The Scrotum:
1. Inspection
a. Contour for lumps or swelling.
b. Scrotal skin for nodules, ulcers, excoriation or inflammation.
c. Absent testicle.
d. Identify each spermatic cord and follow course to the external inguinal ring.
e. Transilluminate any scrotal swellings in dark room with strong light. Swelling contains serous fluid which transilluminates.
2. Palpation of testicles should be smooth throughout surface. Testicles should be of equal size.

C. Hernias:
1. Inspection
a. Observe inguinal and femoral areas for bulges while patient strains. This is suggestive of a hernia.
2. Palpation
a. Use right hand for patients right side and left hand for patients left side.
b. Follow spermatic cord to external inguinal ring.
c. Have the patient cough or strain.
d. A mass that touches the examining finger indicates a hernia (inguinal type).
e. Inspect/palpate anterior thigh in the region of the femoral canal noting tenderness/swelling.
3. Differentiate large scrotal mass
a. With patient lying down, palpate mass in scrotum.
1. If reduces, suspect hernia.
2. If you can get fingers around the mass suspect hydrocele.
3. Bowel sounds auscultated, suspect hernia.
4. Incarcerated hernia: contents cannot be returned to abdominal cavity.
5. Strangulated hernia: blood supply is compromised.

D. Disorders of the male genitalia
1. Penis
a. Syphilitic chancre: dark red, painless ulcer. Has no tender inguinal lymphadenopathy.
b. Genital herpes: cluster of small vesicles, followed by shallow, painful, nonindurated ulcers on red bases.
c. Venereal warts: Rapidly growing, excrescences that are moist and often malodorous.

d. Carcinoma of the penis: indurated nodule or ulcer that is nontender. Limited almost always to non circumcised patients.

2. Scrotum
    a. Varicocele: Varicose veins of the spermatic cord. Fells like a bag of worms.
    b. Hydrocele: non tender, fluid filled mass.
    c. Spermatocele: painless, mobile cyctic mass just above the testes.
    d. Cancer: painless nodule on testicle. Young active duty are high risk age group - teach self examination.
    e. Epidiymitis: Tender, swollen, epididymis. Scrotum may be red and swollen.
    f. Acute orchitis: inflamed, tender, swollen testes.
    g. Testicular torsion: Twisting of the testicle on the spermatic cord. Acutely painful, tender and swollen. This is a surgical emergency.
    h. Cryptorchidism: undeveloped scrotum. Palpate for both testicles. Refer to MO.
3. Anus and Rectum
    a. Exam
        1. Position patient on left side with legs slightly flexed.
        2. Spread buttocks apart with left hand.
        3. Inspect perianal areas for lumps, ulcers, inflammation, rashes, or excoriations.
        4. Lubricate gloved index finger and insert gently toward umbilicus as patient relaxes sphincter.
        5. Turn hand to examine anterior surfaces and prostate, feel to top of gland.
        6. Note other masses.
        7. Withdraw fingers and test stool for occult blood.
    b. Abnormalities of anus and rectum
        1. Pilonidal cyst/sinus tract
            a. Midline superficial to coccyx or lower sacrum.
            b. Identified by opening of sinus tract.
            c. Erythema may be present and a small tuft of hair.
        2. Anorectal fistula
            a. Inflammatory tract from anus or rectum to skin.
        3. Anal fissure
            a. Painful oval shaped ulceration usually midline posterior.
            b. Sentinel skin tag associated with it.
        4. Hemorrhoids: varicose veins of the rectum.
            a. external - below anorectal line.
                - May be uncomplicated, vary in size
                - Thrombosed hemorrhiods are tender, bluish, shiny ovid masses at the anal margin.

- More discomfort may be present than internal.

b. internal - above anorectal line/covered by mucosa.
   - soft, swelling, identified mainly by palpation.

4. Carcinoma of the rectum
   a. Firm nodular mass with central ulceration and rolled edges.
   b. Polypoid masses may be malignant.
5. Carcinoma of prostrate
   a. Irregular, hard single, multiple, or enlarged rock hard nodular surface and /or fixed mass.
6. Benign prostate hypertrophy
   a. Smooth, firm, symmetric enlargement
   b. Sometimes loss of palpable median sulcus
7. Prostatitis:
   a. swollen, enlarged
   b. very tender
   c. "boggy" to palpation
   d. associated with fever

DIAGRAMS OF THE MALE & FEMALE GENITALIA

Your Command: Student Handout, Examination of the Musculoskeletal System

GAIN ATTENTION: During normal routine the CA will be called upon to recognize potential problems and properly examine the musculoskeletal system.

PURPOSE: The purpose of this lesson is to teach the student the proper procedure for examining the musculoskeletal system.

INTRODUCE LEARNING OBJECTIVES:

A. TERMINAL LEARNING OBJECTIVE: Given a simulated patient with simulated symptoms, the student will be able to recognize potential problems and properly perform the needed exam.
B. ENABLING LEARNING OBJECTIVES:
    1. Given a list of tests and disorders of the head and neck select the correct response.
    2. Given a list of tests and disorders of the hands and wrist select the proper response.
    3. Given a list of tests and disorders of the shoulders and elbows select the proper response.
    4. Given a list of tests and disorders of the knees and ankles select the proper response.
    5. Given a list of tests and disorders of the back and hips select the proper response.
C. The instructor will give this class by lecture and demonstration.
D. This material will be covered on a daily quiz and the final oral exam.

Techniques of Examination.

A. Direct attention to structure and function.
    1. Ability to ambulate, sit up, arise from a sitting position, etc.
    2. Comb hair, perform personal hygiene, dress himself.
B. Observe changes in range of motion (ROM).
    1. Any limitation in normal ROM or increase in joint mobility (instability).
    2. ROM varies with individuals and decreases with age.
C. Signs of inflammation
    1. Joint swelling.
        i. Synovial thickening/swelling, boggy, doughy feel to area.
        ii. Joint effusion (excessive fluid, blood) within joint.
    2. Joint tenderness.
        i. Specify anatomical structure that is tender.
    3. Increased joint warmth/heat

i. Palpate by holding back of fingers neat joint in question to sense warmth in comparison to other side.

4. Redness of overlying skin.

D. Palpation (palpable or audible grating/crackling sensation). Most significant with related symptoms. It can be a normal finding.
E. Deformity.
    1. Bony enlargement.
    2. Subluxation (partial dislocation).
    3. Contractures.
F. Condition of surrounding tissues.
    1. Muscle atrophy.
    2. Subcutaneous nodules (Rheumatoid arthritis or rheumatic fever).
G. Muscular strength.
H. Symmetry of involvement.
I. Be gentle/move slowly when handling painful joints. Allow the patient to move the joint that is affected, to show you how they can move it. This will guide how you move the joint.

The detail in which you examine the musculoskeletal system will vary widely depending upon the patient and the problem.

Head & Neck

A. Inspection
    1. Note obvious deformities of mandible and C-spine.
B. Palpation
    1. Temporomandibular joint (TMJ).
        i. place tips of index fingers in front of tragus of ears bilaterally.
        ii. have patient open and close mouth.
        iii. finger tips should fall into joint spaces when open.
        iv. note any swelling, tenderness or clicking.
    2. Cervical spine.
        i. observe for deformities or abnormal posture
        ii. palpate for tenderness along spinous process, paravertebral and trapezius muscles.
    3. Test ROM.
        i. touch chin to chest (flexion).
        ii. touch chin to each shoulder (rotation).
        iii. touch each ear to corresponding shoulder (lateral bending).
        iv. put head back (extension).

Hands and Wrist

A. Test range of motion be asking patient to:
    1. Extend and spread fingers of both hands.
    2. Make a fist with thumbs across knuckles.
    3. Flex, extend, ulnar and radial deviate the wrists.
B. Inspect for abnormality (deformity, nodules, swelling, redness, etc.)
C. Palpation
    1. Medial/lateral aspects of each interphalangeal joint. In osteoarthritis you may find hard dorsolateral nodes at the DIP joints.
    2. Between your thumbs palpate the metacarpophalangeal (MCP) joints just distal to and on each side of the knuckles. Commonly affected in rheumatoid arthritis, rarely in osteoarthritis.
    3. Palpate wrist joints with thumbs on dorsum of wrist.
        i. note swelling, tenderness or bogginess. Bilateral suggests rheumatoid while monarticular arthritis, especially in our population, suggest gonococcal arthritis.
            a. gonococcal infection may involve wrist joints (arthritis) or tendon sheaths (tenosynovitis).

Elbows

A. Test range of motion (ROM)
    1. Have patient bend and straighten elbows.
    2. With arms at sides have patient turn palms up (supination) and down (pronation).
B. Inspect for nodules, swelling while supporting the patients forearm to hold elbow at 70°.
C. Palpate
    1. Groove on each side of olecranon for thickening.
    2. Press on lateral and medial epicondyles, noting any tenderness. Lateral tenderness is associated with tennis elbow, while medial tenderness is associated with pitchers elbow.

Shoulders and Clavicles

A. Test range of motion (ROM)
    1. Raise extremities vertically at sides of head.
    2. Place hands behind neck with elbows out to the side (external rotation and abduction).
    3. Place hands in small of back (internal rotation).

    Cup hand over joint for crepitation during ROM.

B. Inspect shoulder girdle and clavicles.
    1. Anteriorly for deformity, swelling, or atrophy.
    2. Posteriorly inspect scapular and muscular areas for the same.
C. Palpate for tenderness in the:
    1. Sternoclavivular joint.
    2. Acromioclavicular joint (AC joint)
    3. The subacromial area: most common cause of shoulder pain is rotator cuff tendinitis (the impingement syndrome).
    4. Other area of the shoulders, including the greater tubercle of humerus and bicipital groove.

Feet and Ankles

A. Inspection
    1. Calluses and corns.
    2. Deformities or nodules.
    3. Swelling.
B. Palpation
    1. Palpate anterior surface of ankle joint for swelling, tenderness or bogginess.
    2. Feel along achilles tendon for nodules.
    3. Compress the fore part of the foot for metatarsophalangeal joint tenderness between thumb and fingers. Tenderness is early sign of rheumatoid arthritis.
    4. Palpate metatarsal heads individually between thumb and finger. Tenderness is called metatarsalgia and has many causes.
C. Test ROM
    1. Dorsiflex and plantar flex the foot at the ankle (tibiotalar joint).
    2. Stabilize ankle with one hand and grasp heel with other.
        i. invert foot at subtalar joint.
        ii. evert foot at subtalar joint.
    3. Stabilize heel with one hand and invert/evert the forefoot (transverse tarsal joint).
    4. Flex toes on metatarsaphalangeal (MTP) joints.
    5. Arthritic joints usually tender in all directions of movement vs. ligamentous sprain with painful stretching of ligament in one direction.

Knees and Hips

A. Inspection
    1. Alignment/deformity
        i. bow legs *(genu varum)*.
        ii. knock knees *(genu valgum)*.
        iii. flexion contracture (unable to extend fully).

2. Look for loss of normal hollows superior to patella/adjacent to patella. The loss is an early sign of:
    i. synovial thickening.
    ii. fluid in joint (effusion).

B. Palpation
1. Suprapatellar pouch between thumb and fingers.
2. Compress suprapatellar pouch with one hand and palpate with other hand:
    i. either side of patella.
    ii. tibiofemoral joint space itself.
    iii. note tenderness, thickening, warmth or bogginess in joint spaces or near femoral condyles. Finding warmth and tenderness is indicative of synovial inflammation. Nontender effusion common in osteoarthritis.
3. Palpate popliteal space for swelling and cysts.
4. Signs of effusion:
    i. Bulge sign: milk upward with hand on knee 2-3 times then tap patella and watch for bulge of returning fluid in medial hollow area adjacent to patella.
    ii. Ballottable patella: grasp leg just above knee firmly and displace fluid into space behind patella. Briskly tap patella down against femur, if fluid is present a palpable "tap" is noted.
5. Patellofemoral compartment
    i. compress patella and move against femur and flex knee.
    ii. have patient tighten quadriceps while pushing patella distally.
    iii. note any pain or crepitus which occurs in chondromalacia patella and osteoarthritis.
        a. **Patella Inhibition Test**: Have patient relax quadriceps. Push down on proximal tendon above the patella while patient tightens the quadriceps. If patient quickly releases the tightening or shows sign of pain, the test is positive. Often seen in chondromalacia patella.
        b. **Patellar Apprehension Test**: Push the patella medially and observe the patient for any sign of resistance or appearing worried. Patients with patella subluxation often positive.
6. Tibiofemoral joint
    i. Flex knee to 90° with the patients foot resting on the exam table. Palpate along tibial margins from the patella tendon toward each side of the knee, and then along the course of collateral ligaments. joint line tenderness is indicative of a damaged meniscus.
7. Tibial tuberosity
    i. Press on the tibial tuberosity and note any swelling or pain. Tenderness and swelling suggests Osgood-Schlatter Disease.

C. Test for ROM
    1. Rotation at hip.
        i. Flex leg to 90° at hips and knees. Swing leg medially for external rotation and laterally for internal rotation. Internal rotation restriction is indicative of hip disease.
    2. Flexion at the hip and knees.
        i. Flex knee upwards and pull firmly against abdomen. Note if opposite leg remains on table fully extended. Flexion of opposite leg indicates a flexion deformity of that hip.
    3. Abduction of the hips
        i. Stand at the end of table and hold feet and spread legs apart.

D. Test for injury of knee joint.
    1. Drawer sign: Flex knee at 90° and stabilize foot by gently sitting on it while grasping thelower leg at the joint line with thumbs anterior and fingers posterior. Attempt to push forward and backward.
        i. Increased mobility anteriorly indicates anterior cruciate ligament instability.
        ii. Increased mobility posteriorly indicates posterior cruciate ligament instability.
    2. McMurrays sign: Flex the knee until the heel neatly reaches the buttocks while grasping the knee with one hand at the joint line and rotate the foot/lower leg laterally with the other. Then extend the knee to 90° with the foot still in lateral rotation, repeat with foot in medial rotation. Most sensitive for medial meniscus injuries.
        i. A palpable or audible click in lateral rotation suggests a torn medial meniscus.
        ii. A click in medial rotation suggests a torn lateral meniscus.
    3. Appleys Grind test: Useful to tell apart meniscal and ligamentous injuries. With the patient lying on their stomachs, hold the heel of the foot and press down firmly while alternately moving the andle medially and laterally. Then pull up and stress the joint medially and laterally. Pain with compression indicates meniscal injuries, while pain with distracion is indicative of collateral ligament damage.

Back and Spine

A. Inspection
    1. Profile for cervical, thoracic and lumbar curves.
    2. Posterior view for any lateral curvature (scoliosis).
        i. Note difference in shoulder height.
        ii. Note difference in levels of iliac crest. Pelvic tilt suggests unequal leg lengths.

B. Test ROM (Observe spinal curves during maneuvers.
    1. Toe touch (flexion). Lumbar concavity should flatten. Muscle spasm may prevent the flattening.
    2. Side bend (lateral bending) while stabilizing pelvis in seated postion.
    3. Backward bending (extension).
    4. Twisting shoulders (rotation).
C. Palpatation
    1. Have patient sitting or standing.
    2. Using thumb, palpate each spinous process. (percuss with ulnar aspect of fist if necessary).
        i. Pain with palpation of the spinous processes may indicate herniated disc.
        ii. Pain with percussion may indicate osteoporosis/compression fracture, infection or malignancy. CVA tenderness indicative of kidney disease.
    3. Inspect/palpate paravertebral muscles for tenderness or spasm.
        i. Muscle spasms appear prominent, tight feeling and usually tender.
D. Evaluation for herniated lumbar disc/sciatica.
    1. Straight leg raises (SLR).
        i. Patient supine.
        ii. Raise leg passively until pain in posterior leg occurs. Pain in back alone is not a positive straight leg raise.
        iii. Dorsiflex foot.
        iv. Leg pain exacerbated by dorsiflexion of foot is a positive SLR and is indicative of lumbosacral nerve root ittitation. (note: tight hamstrings may produce discomfort behind knees).

GROUP AID STATION
Headquarters Company
Headquarters & Service Battalion
2D Force Service Support Group
U. S. Marine Corps Forces, Atlantic
Camp Lejeune, North Carolina 28542-0125

STUDENT HANDOUT
MUSCULOSKELETAL DISORDERS

GAIN ATTENTION: During normal routine the CA will be called upon to recognize potential problems and properly examine the musculoskeletal system.

PURPOSE: The purpose of this lesson is to teach the student the proper procedure for examining, diagnosing and treating musculoskeletal disorders.

INTRODUCE LEARNING OBJECTIVES:

A. TERMINAL LEARNING OBJECTIVE: Given a simulated patient with simulated symptoms, the student will be able to recognize potential problems and properly perform the needed exam.
B. ENABLING LEARNING OBJECTIVES:
    1. Be able to identify the different disorders of the musculoskeletal system by shading the correct response.
    2. Be able to identify the signs and symptoms of musculoskeletal disorders shading the correct response.
    3. Be able to isentify the treatment of these disorders by shading the correct response.
C. The instructor will give this class by lecture and demonstration.
D. This material will be covered on a daily quiz and the final oral exam.

MUSCULOSKELETAL AND ORTHOPEDIC PROBLEMS

SOAPER note for ortho.

A. History
    1. Mechanism of Injury (MOI): describe in great detail what happened. What forces and direction acted on the extremity. What motion occurred at the extremity (i.e., twisting, hyperextension, valgus, varus, etc.).
B. Examination
    1. Inspection (effusion, edema, deformity, ecchymosis, etc.).
    2. Palpation: following anatomical landmarks.
    3. Test for ligamentous stablilty.
    4. Range of Motion (ROM): active and passive.
    5. Neuro status: always assess motor, sensory and vascular status distal to the injury (include pulses and capillary refill).
    6. X-ray if any possiblilty of fracture.
C. Assessment and Plan: as indicated. NOTE: Be sure to stress rest and rehab exercises when given.
D. Education (patient)
E. Return (follow up)

COMMON DISORDERS

Inflammation - itis

A. Bursitis: an acute or chronic inflammaion of a bursa
    1. Bursa: A synovial lined sac aontaining synovial fluid at sites of friction between tendons and bones. Located at shoulders, elbows (olecranon

bursitis "students elbow"), wrists, knees (prepatellar bursitis "housemaids knee"), and ankles.

2. Etiology
    i. Friction: At sights of repeated excessive friction.
    ii. Chemical: Commonly calcium deposits or gout.
    iii. Infection/Septic: Introduction of bacteria into bursa may progress to septic arthritis.
3. Signs and Symptoms
    i. Localized pain and tenderness.
    ii. Pain with range of motion (ROM).
    iii. Swelling (especially superficial bursa such as prepatellar, infrapatellar, and olecranon).
    iv. Redness and warmth (think of infection).
4. Diagnosis
    i. Must rule out other causes (i.e., tendon/muscle tear, cellulitis, arthritis).
    ii. X-ray: May reveal calcium deposits.
5. Treatment
    i. Anti-inflammatory medications (Motrin 800mg TID or ASA 10-15grs QID, or other NSAID).
    ii. Rest with intermittent ROM exercises.
    iii. Splinting may be necessary in severe or refracture cases.
    iv. Severe bursitis or any sign of infection refer to MO.
    v. Follow up in 3-5 days.

Tendonitis and Tenosynovitis - Inflammaiton of a tendon and/or tendon sheath. Usually occurs together.

A. Etiology
    1. Often undetermined
    2. Commonly "overused" due to extreme or repeated traumatic strain or excessive, unaccustomed exercise.
    3. May be due to systemic disease (i.e., rheumatic syndrome)
B. Commonly affected areas
    1. Shoulder capsule and associated tendons
    2. Flexor carpi radialis or ulnaris.
    3. Flexor Digitorum
    4. Hip capsule and associated tendons
    5. Hamstrings
    6. Achilles tendon
C. Signs and Symptoms
    1. Pain with activity:
        i. Increased with passive stretching.
        ii. Increased with forceful contraction against resistance.

2. Localized tenderness
3. May have swelling and inflammation.
4. May have friction rub or crepitus over the site. Crepitus is a sign of a more severe disease.

D. Diagnosis
1. Must rule out tendon rear or rupture.

E. Treatment
1. Rest
2. Heat or cold (either may benefit). Cold for acute injuries.
3. Anti-inflammatory medications (Motrin, ASA, etc.)
4. Immobilization may be necessary in severe or refractory cases.
5. Severe or any sign of infection refer to MO.
6. Follow up in 3-5 days.

Septic Arthritis - An orthopedic emergency.

A. Etiology
1. Entrance to joint usually be direct extension from an adjacent infection or by hematogenous spread.
2. Staphylococcus is usually the offending organism.
3. Gonococcal arthritis presents commonly in our population. It is a monarticular septic arthritis and is generally in the knee.

B. Commonly affected areas:
1. Knee
2. Hand
3. Elbow

C. Signs and Symptoms
1. Pain most common early symptom.
2. Warm, swollen, diffusely tender joint.
3. Usually held in slight flexion.
4. Passive motion extremely painful.
5. Fever and other signs of systemic infection may be present.

D. Diagnosis
1. Any question of early septic arthritis or severe cellulitis near a joint requires immediate referral to an MO, who will probably refer to orthopedics on a "today" consult for hospitalization and IV antibiotics.

Epicondylitis or **"Tennis Elbow"** (lateral humeral)

A. Etiology (lateral epicondylitis)
1. An "over use syndrome" caused by repetitious, strenuous supination of the wrist against resistance (i.e., screwdriver, tennis) or by violent extension of wrist with hand pronated.

2. Exact cause unknown, but minor tear in the tendonous attachments of the muscles are often present.
3. Essentially a "strain" of the lateral extensor forearm muscles near their origin of the lateral epicondyle of the humerus.

B. Signs and Symptoms
1. Amount of pain mild to moderate but usually constant.
2. Pain over lateral epicondyle with radiation to outer side of forearm.
   i. Increases with extension of the wrist and supination of the forearm against resistance.
   ii. Often point tenderness distal to lateral epicondyle.
3. May have weakness of wrist extenors secondary to pain.

C. Treatment
1. Rest - Avoid pain producing motions.
2. Anti-inflammatory medications (ASA, Motrin, etc.).
3. Immobilization with a sling, arm band..
4. Severe or refracroty cases refer to MO who may try casting or splinting.

ACUTE TRAUMATIC INJURIES

Ankle Strains - Usually results from an acute inversion injury in which a ligament is stretched beyond their normal ROM.

A. Classification
1. **Grade I**: *(mild)* Ligaments stretched but not torn. Mild tenderness and mild swelling.
2. **Grade II**: *(moderate)* Ligaments torn but not completely ruptured. Marked swelling and tenderness, but with negative anterior drawers test.
3. **Grade III**: *(severe)* A complete ligamentous rupture. Marked swelling and tenderness with instability indicated by a positive anterior drawers test.

B. Signs and Symptoms
1. Pain, swelling, ecchymosis over ligaments.
2. Difficult, painful ROM.
3. Must try to palpate each ligament individually (anterior talofibular, calcaneofibular, however is difficult in initial presentation because of swelling.

C. Diagnosis
1. Must obtain X-ray. (ankle series to rule out fracture).
When should you order X-rays?

THE OTTAWA ANKLE RULES

Ankle Injuries:

An ankle radiographic series is only required if there is any pain in malleolar zone and any of these findings:

a. Bone tenderness at A (see diagram).
   or,
b. Bone tenderness at B
   or,
c. Inability to bear weight immediately and in clinic.

Foot Injuries:

A foot radiographic series is only required if there is any pain in midfoot zone and any of these findings:

d. Bone tenderness at C (see diagram)
   or,
e. Bone tenderness at D
   or,
f. Inability to bear weight both immediately and in clinic.

2. Order foot series or tib/fib series, is indicated, to rule out associated fractures.
3. Must rule out associated fractures by palpating for tenderness on proximal 5th metatarsal and proximal fibula.

D. Treatment

1. Initial (all grades)
   i. Compressive dressing (posterior splint or modified Robert-Jones).
   ii. Rest-ligth duty with crutches if difficult ambulation.
   iii. Ice and elevation.
   iv. NSAID (Motrin, ASA, etc.)
   v. Follow up in 3 days.
2. Follow up
   . Grade I:
      a. Continue light duty for one (1) week.
      b. Continue analgesics.
      c. Begin ankle rehab exercise.
      d. Begin physical training at own pace.
   i. Grade II and III:
      a. Refer to MO who may place in straight leg wlaking cast x 3-5 weeks followed by ankle rehab.

Ligamentous injuries of the knee

A. MOI usually forseful stress.
    1. Valgus stress damages MCL (medial collateral ligament). MCL is damaged more often than LCL typically due to being tackled from the outside forcing the knee inward.
    2. Varus stress damages LCL (lateral collateral ligament).
    3. ACL (anterior cruciate ligament) is injured by the knee being forced into hyperextension. Typical injury occurs when tackled from the front.
    4. Most serious of knee disorders because delay in treatment my lead to a clinically unstable knee.
B. Signs and Symptoms
    1. Acutely the ability to bear weight is often lost.
    2. Effusion (joint swelling) may be large and immediate due to hemorrhage.
    3. A "pop" or tearing may have been heard.
    4. Ligamentous instability on physical exam: often difficult to determine in an acute injury due to guarding of muscle spasm.
    5. Incomplete tear or sprain are often more painful than complete rupture.
    6. Patients with old injuries and clinically unstable knees often complain of knee "going out" or "giving way" and often hove chronic effusion.
C. Physical Exam
    1. Inspection: effusion in all, and ecchymosis over the affected ligaments in LCL and MCL.
    2. Palpation: point of maximum tenderness is often along course of collateral ligaments.
    3. Stablility: (patient relax and supine):
        i. Ab/Adduction stress at 30° flexion (cruciates relaxed). Prevents false negative.
        ii. Ab/Adduction stress at 0° (cruciate tightened if stable at 30° collateral intact (will be stable at 0°).
            a. If unstable at 30° and stable at 0°, collateral out but cruciate intact.
            b. If unstable at 30° and stable at 0°, both collateral and cruciate out.
        iii. Drawers sign - anterior and posterior. Hip at 45° and 90° of knee. Look for firm, solid point without laxity. A test for ACL alone.
    4. X-rays to rule out avulsion fracture.
D. Classification of MCL and LCL injuries.
    1. Grade I: pain over ligament. No laxity. Strained but not torn.
    2. Grade II: partial tear. May have small amount of laxity.
    3. Grade III: complete rupture: (+) laxity.
E. Treatment (**Refer to MO if any question of ACL instability.**)
    1. Grade I and II: RICE (Rest, Ice, Compressive dressing, and Evaluation) and analgesics.

2. Grade III: early surgical repair.
3. Chronic ligament instability usually requires reconstructive surgery in order to prevent further joint deterioration.

Meniscal injuries of the knee

A. Meniscus: "c" shaped cartilage which acts as a cushion between the femur and tibia.
B. Most common of all knee injuries.
C. MOI: usually a twisting injury of the knee with the foot in weight bearing portion.
D. Medial meniscus is injured 10 times more frquently because it is more firmly attached and less mobile.
E. Clinical features:
    1. Often history of a "popping", "grinding", or "tearing" sensation inside joint.
    2. Often history of "locking (preventing full extension). Indications of a "bucket handle" tear.
    3. Joint line tenderness (medial or lateral) is the most reliable physical sign.
    4. Effusion usually occurs slowly over several hours.
    5. McMurray's and Appley's tests may be positive.
    6. Acute symptoms usually subside to be replaced by intermittent episodes of locking, clicking, buckling, swelling and pain.
F. Treatment
    1. Initial: rest, light duty and anti-inflammatory meds.
    2. If unable to fully extend knee it is called a locked knee and needs immediate referral.
    3. Refer to MO for orthopedic consult. Arthroscopy may give definitive diagnosis and treatment.

Acromioclavicular (AC) joint injuries (shoulder)

A. MOI fall on shoulder or direct blow to top of shoulder.
B. Classification
    1. 1° AC sprain (shoulder pointer): inclomplete tear of the AC ligament without separation.
    2. 2° AC sprain (partial separation): more severe disruption of the joint capsule that allows subluxation of the AC joint: acromioclavicular ligament is torn but coracoclavicular ligament is intact.
    3. 3° AC sprain (shoulder separation): complete AC joint subluxation, both AC ligaments and CO ligament are torn.
C. Clinical Features:
    1. Tenderness and swelling over AC joint.
    2. Outer clavicle may be elevated depending on degree of sprain.
    3. Downward traction of the arm may cause increase deformity.

D. X-ray indicated: order bilateral shoulder AP comparison views without and with weights.
    1. 1° AC sprain: usually appears normal.
    2. 2° AC reveals small amount of dispacement of distal clavicle with weights compared to opposit side.
    3. 3° AC sprain: distal end of the clavicle displaced upward in relation to acromion.
        i. Distance between coracoid process and clavicle is also widened.
E. Treatment
    1. 1° and 2° AC sprains:
        i. Sling until tenderness subsides (usually 10 days to 3 weeks).
        ii. Analgesic/anti-inflammatory medications.
        iii. Then ROM exercise program.
    2. 3° AC sprain: Orthopedic consult for possible surfical intervention with reduction of dislocation and repair of ruptured ligaments.

CHRONIC KNEE PAIN

A. Patellofemoral Pain Syndrome (PFS)
    1. A clinical diagnosis which encompasses a myriad of known and unknown causes of knee pain.
B. Chondromalacia patella (one known cause is a **surgical diagnosis** characterized by softening, and fragmentation of the articular cartilage of the posterior surface of the patella).
C. There is no direct correlation between the extent of chondromalacia changes of the cartilage and the amount of pain experienced, therefore PFS is a better term clinically.
D. Signs and Symptoms
    1. Typically a several month history of increasing knee pain (parapatella, deep inside).
    2. Pain increases with activity and decreases with rest.
    3. Increasing knee pain wiht extended periods of knee flexion (i.e.: sitting). Positive "movie sign": will periodically try to straighten knee.
    4. Pain increases with excess distance running, hiking, stair climbing, jumping and over-zealous use of "knee machines".
    5. May complain of clicks, pops, grinds, swelling, some slight giving way and weather changes.
E. Exam may reveal
    1. Pain and apprehension with patellofemoral compression.
    2. Tenderness over medial facet of patella.
    3. Grinding or crepitus with articulation during flexion and extension with compression.
    4. Quadriceps muscle weakness and/or atrophy.
    5. If severe may have joint effusion.

F. Management
    1. Counseling, reassurance usually a manageable problem with return to activity.
    2. Rehablilitation. quadriceps conditioning, physical therapy, and/or exercise sheet. Studies show good results with structured supervised rehab program.
    3. Anti-inflammatory drugs.

Osgood-Schlatter Disease (osteochondritis of the tibia tubercle)

A. Etiology
    1. Trauma is a frequent factor.
    2. A single violent or lesser repeated flexion of the knee against a tight quadriceps.
    3. Causes disruption of secondary growth plate obstructing blood supply and leading to aseptic necrosis and fragmentation of the tibial tubercle.
    4. Commonly affects children in rapid growth period of puberty, especially boys.
    5. Complication is a nonunion of the tibial tubercle which remains syptomatic into adult life. Most heal in childhood.
B. Clinical Fractures
    1. Pain, tenderness and soft tissue swelling (without inflammatory signs) over tibial tubercle.
    2. Increases pain with activity impairing strong quadriceps contractions and therefore strain on tibial tubercle (i.e.: stair climbing, running).
    3. Active extension of knee agaist resistance is painful.
    4. Kneeling aggravates condition.
    5. X-rays: order knee series to confirm diagnosis (AP & lateral views).
C. Treatment
    1. Rest/decreased activity: maintain knee in full extension.
    2. Ice
    3. Anti-inflammatory medications.
    4. Severe cases may require knee immoblilizer for several months.
    5. Physical therapy: CMP exercise may be helpful.
    6. Orthopedic consult for surgical evaluation if all else fails.

Low Back Pain

A. Is a symptom, not a diagnosis.
B. Not easy to find objective evidence.
C. Etiology:
    1. Mechanical LBP: postural, usually chronic, a diagnosis of exclusion, treatment: change habits, back school, exercise.
    2. Acute lumbar muscle strain: non radiating: often with sprain.

3. Disc herniation: LBP with radiation down one leg and/or localizing changes in motor or sensory function or reflexes.
4. Referred pain
    i. Female: endometriosis, ovarian tumor, PID, UTI.
    ii. Male: UTI, prostatitis.
    iii. Both: pancreatitis.
    iv. Psychosocial problem
    v. Neoplasma
    vi. Infections
    vii. Miscellaneous medical problems and diseases.

Approach to patient with acute back pain

A. Subjective **(Questions that must be asked)**.
    1. Pain: character, location, radiation, duration.
    2. Precipitating factors, prior history.
    3. Numbness, weakness, bowel, bladder problems. Sign of disc disease.
    4. Fevers, weight loss, other systemic symptoms.
B. Objective
    1. General: discomfort, ease of movement, undressing.
    2. Back: note any deformities.
        i. Tenderness over vertebra or paraspinous muscles.
        ii. Muscle spasm.
        iii. ROM: flexion/extension and side bending.
        iv. Straight leg raises (positive procedures).
        v. Check for CVA tenderness.
    3. Neurologic: motor, sensory and DTR's.
    4. GU/rectal: checking for anal and sphincter tone. Prostate should be checked for signs of inflammation.
    5. Genitals/Hernia: look for epididymitis, testicular cancer, and hernias.
C. Assessment: rule out serious injury first.
D. Plan
    1. Lumbar strain
        i. Rest: light duty or bed rest depending on severity.
        ii. Muscle relaxants/analgesics (ex. Parafon Forte DSC or Flexeril and an NSAID i.e. Motrin).
        iii. Back exercises and postural instructions
        iv. Physical therapy: back school if chronic
        v. Heat or cold may help symptoms.
    2. With neurologic findings
        i. Refer to MO.
    3. Evidence of systemic disease
        i. Refer to MO.

COMMON AFFLICTIONS OF THE HAND

INFECTIONS

A. Paronychia: infection of the soft tissue around the fingernail which often begins as a hangnail and is usually caused by a staph infection.
    1. Signs and Symptoms: erythematous, swollen, tender, soft tissue at nail margin. May have purulent drainage or fluctuant area.
    2. Treatment: refer to MO who will I&D abscess and treat with antibiotics (Rocephin and Dicloxacillin or Velosef) and saline soaks.
B. Felon: Infection of pulp of the distal phalanx
    1. Usually secondary to a local puncture wound.
    2. Characterized by increasing pressure and pain over pulp of the distal phalanx.
    3. Treatment: refer to MO who will I&D abscess and give antibiotics.
C. Purulent Tenosynovitis: infection of the tendon sheath of a digit
    1. Etiology
        i. Extension of a felon
        ii. Directly from a puncture wound, typically from a human tooth from punching someone in the mouth.
    2. Signs and Symptoms
        i. May appear as innocent appearing cut over knuckles.
        ii. Puncture wound or laceration near involved tendon.
        iii. Regard as human bite until proven otherwise.
    3. Kanavel's - Four cardinal signs.
        i. Finger is uniformly swollen.
        ii. Finger is held in slight flexion for comfort.
        iii. Intense pain on passive extension of the finger.
        iv. Marked tenderness along course of inflamed sheath.
    4. Treatment
        i. Refer to MO immediately
        ii. Requires surgery to drain the infected tendon sheath and IV antibiotics.

BOXER'S FRACTURE

A. A fracture of the fifth metacarpal head caused by striking a hard object or second party. (Important to note if hit someone in the mouth).
    1. Signs/Symptoms
        i. Pain, swelling, and deformity usually over the fifth MCP joint or fifth metacarpal.
        ii. Look for abrasions or lacerations and rule out **human bite**.
        iii. X-ray - hand series to determine fracture versus contusion.

B. Treatment
    1. Refer to MO.
    2. Will probably require reduction of fracture and application of a short arm cast with 5th digit outrigger or ulnar gutter splint for 4-6 weeks.

SCAPHOID FRACTURE OF THE WRIST

A. Mechanism of injury - usually patient fell on outstretched hand with hyperextension of the wrist.
B. Scaphoid is the carpal bone most prone to fracture.
C. Precarious blood supply.
    i. Blood supply enters distal portion of scaphoid, therefore, a fracture through the midsection may lead to aseptic necrosis of the proximal fragment.
    ii. Nonunion occurs frquently.
D. Signs/Symptoms
    i. Localized pain and swelling over distal radius and wrist.
    ii. Significant pain over the "anatomical snuffbox" (bone of first metacarpal and scaphoid tubercle) is pathognomonic.
E. X-rays are normal initially but a fracture will become visible in 2-4 weeks if present.
   Order scaphoid series, not just wrist.
F. Diagnosis is made by positive "snuffbox" tenderness.
G. If suspected fracture:
    1. Refer to MO
    2. Will need short arm cast with thumb spica.
    3. Re X-ray in 3-4 weeks.
    4. If fracture present continur short arm cast until healed (6 weeks - 6 months)

DIAGRAMS OF THE MUSCULOSKELETAL SYSTEM

Mental Status and Neurological Exam

Allotted time:

References:

Terminal learning objectives: Given a simulated patient with simulated symptoms, the student will be able to recognize potential problems and properly perform the needed exam.

Enabling learning objective:

1. The student will be able to identify the different components of the mental status exam.
2. The student will be able to identify the different types of speech, thought, and emotional status.
3. The student will be able to identify the 5 basic areas of the neuro exam.
4. The student will be able to identify the twelve cranial nerves and the function of each.
5. The student will be able to identify the components of the sensory system.
6. The student will be able to identify the different reflexes and their functions.

I. Setting of the mental status exam
    1. well lit room
    2. free of distractions
    3. question family and friends

II. Appearance and behavior
    a. Level of consciousness
        1. normal
        2. drowsiness or obtundation
        3. stupor
        4. coma
    b. Posture and motor behavior
        1. gait
        2. gestures
        3. mannerisms
        4. speed of movement - fast, normal, slow
        5. over or under active

6. purposeful or disorganized

c. Dress, grooming, and personal hygiene
   1. appropriately dressed for age, social status
   2. cleanliness
   3. hair, teeth, and nail care
   4. use of cosmetics

d. Facial expressions
   1. appropriate to topics being discussed
   2. describe
      a. alert
      b. tense
      c. worried
      d. sad
      e. happy
      f. angry
      g. laughing

e. Manner, affect, and relationship to persons and things.
   1. Describe (afraid, seeking help, evasive, etc.)
   2. Affect (voice, facial expression, and movement appropriate to topic)
      a. paranoid - anger, hostility
      b. manic - elation, euphoria
      c. schizophrenia - flat, remote
      d. depression - anxiety or depressed

III. Speech and language
. quantity
   a. rate
   b. volume - rapid and loud, mania, soft and low
   c. fluency
      1. poor articulation
      2. distributed rhythm and inflection
      3. circumlocution - substituted words or phrases
      4. paraphasia - malformed, wrong, or invented words
      5. aphasia - involves circumlocutions and paraphasia and require special testing

IV. Mood - as reported by patient ("sadness, depressed " , etc.)
. intensity
   a. duration
   b. appropriate to circumstances
   c. congruent to affect

V. Thought and perceptions (logic, relevance, organization and coherence)

. Thought process

1. Circumstantially - indirection and delay of reaching the point because of unnecessary details.
2. Looseness of associations - shift of subjects without meaningful connections (psychosis)
3. Flight of ideas - rapid shifts from topic to topic with understandable connections (mania)
4. Thought blocking - sudden interruption of speech in mid-sentence or before thought complete (psychosis)
5. Confabulation - fabrication of facts or events to cover impaired memory. Patient is not intentionally lying (organic brain syndromes)
6. Preservations - persistent repetition of words and ideas (obs and psychosis)

a. Thought content

1. Compulsions - repetitive acts, feels driven to perform. If act not performed, anxiety increases, an obsession that takes the form of a motor act.
2. Obsessions - recurrent, uncontrollable thoughts or impulses that the person considers unacceptable or alien.
3. Phobias - persistent, irrational fears.
4. Anxieties - apprehensions, fears, tensions, or uneasiness that may be focused (phobia) or free floating.
5. Depersonalization - feeling one's self is different, changed, or unreal.
6. Delusion - a false fixed belief, not shared by the patients culture or subculture based on unrealistic grounds.
    a. persecution (paranoid)
    b. control (forces outside themselves)
    c. grandeur (wealth, power, claim to be a famous person)
    d. somatic (diseases, unusual symptoms, or physical defects)
    e. reference - external events have personal significance (messages from TV)
7. Perceptions
    a. illusions - misinterpretation of real stimuli
    b. hallucinations - no relevant stimuli
        1. auditory
        2. visual - generally related to substance abuse
        3. olfactory
        4. gustatory
        5. somatic - body part missing, diseased
        6. tactile
8. Insight and judgment

a. insight - "what brought you to the hospital" or "why are you here"
b. judgment - "what would you do if you found a stamped envelope"

VI. Memory and orientation
. Orientation
1. person - does pt know who he/she is?
2. place - location, where he/she lives?
3. time - day of week, date, time of day?

a. Attention
1. Digit span - repetition of series of numbers forward and reverse. Start with 2 or 3 number series and work up until pt no longer gets them right.
2. Serial 7's - subtracting 7 from 100 until zero is reached or adding seven.
3. Spelling - short words forwards and backwards

b. Remote memory - place of birth, where he/she is from

c. Recent memory - questions related to the presenting problem. (the days weather, appointment time, etc.)

d. New learning ability - give 4 words, ask patient to repeat them and remember them. Check in 3-5 minutes to see if they remember them.

VII. Higher cognitive function
. information and vocabulary (who is president)
a. calculation - simple multiplication
b. abstract thinking
1. Proverbs - use three common proverbs and look for abstraction of the meaning vs. concrete interpretation
2. Similarities - an orange is to an apple, etc.

VIII. Suicidal and homicidal patients
. MUST be evaluated by an MO
a. Most are not mentally ill.

IX. Summary/Assessment
. Summary of findings/conclusions
a. Tentative diagnosis
b. Treatment plan
c. The mental exam is the psychiatric counterpart of the physical exam.

X. General approach to the neurologic exam.

. Organize exam into 5 basic areas.

1. mental status/speech
2. cranial nerves
3. motor systems/cerebellar system
4. sensory system
5. reflexes

a. Definitions

1. dermatome
   a. A specific band of skin innervated by a sensory nerve root of a specific spinal segment.
   b. Aid in localizing a specific location of lesions.

XI. Techniques of examination

. Mental status and speech

1. appearance
2. speech
3. state of consciousness
4. orientation
5. intellect and judgment
6. any abnormalities in the above require a more detailed exam

a. Cranial nerves

1. Mnemonics for remembering nerves (1st letter stands for first letter of nerve)
   a. 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. Function - (1st letter) S=sensory, M=motor, B=botSome Say Marry Money But My Brother Says Bad Boys Marry Money
   c. LR6 & SO4 - Lateral Rectus = cranial nerve VI, Superior Oblique = cranial nerve IV $(LR_6SO_4)^3$
2. Cranial Nerve I (CN-I): Olfactory
   a. Sense of smell
   b. Test by holding familiar items under patients nose with patients eyes closed. Clamp each nostril testing each one separately.
3. Cranial nerve II (CN-II): Optic
   a. Vision sense
   b. Test visual acuity, visual fields, peripheral vision, and fundoscopic exam

4. Cranial nerves III, IV, & VI: Oculomotor = CN-III, Trochlear = CN-IV, Abducens = CN-VI
    a. Function
        1. CN-III - extraocular muscle movement, pupillary light accommodation and consensual reflexes, and elevation of eyelid.
        2. CN-IV - superior oblique muscle for inferior medial movement of the eye.
        3. CN-VI - lateral rectus muscle movement for horizontal lateral movement of the eye.
    b. Test for extraocular muscle movement by:
        1. holding a small object in front of patient
        2. have patient follow object as it is moved through the 6 cardinal positions of gaze.
        3. look for any nystagmus - horizontal, vertical, or rotary
            a. inferior oblique (III)
            b. medial rectus (III)
            c. superior oblique (IV)
            d. inferior rectus (III)
            e. lateral rectus (VI)
            f. superior rectus (III)
    c. test for size and shape of pupils, pupillary reaction to light, and accommodation.
5. Fifth cranial nerve (CN-V): Trigeminal nerve
    a. Function
        1. Motor - temporal, and masseter muscles along with lateral movement of the jaw.
        2. Sensory - three separate distributions
            a. V-1 = to the forehead
            b. V-2 = to the cheeks
            c. V-3 = to the chin
    b. Test function
        1. Corneal reflex - touch cornea with a fine wisp of cotton while patient gazes upward/away from examiner and look for blinking.
        2. Test motor function by having patient clench teeth and move jaw side to side. Palpate strength of muscle contraction. Feel contraction of temporal muscles.
        3. test sharp/dull sensation with a safety pin and light touch to forehead, cheeks, and chin on both sides.
        4. If abnormal, then test temperature sensation.

6. 7th cranial nerve (CN-VII): Facial nerve
    a. Function
        1. Motor - muscle of facial expression, taste to anterior 2/3 of tongue
    b. Test function
        1. Inspect face for symmetry, abnormal movements, or tics.
        2. 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.
    c. Types of facial paralysis:
        1. Lower motor neuron - typical of Bells Palsy
            a. when closing eyes - does not close on affected side, eyeballs roll upward, & flat nasolabial fold
            b. when raising eyebrows - forehead not wrinkled, eyebrow not raised, paralysis of lower face
        2. Upper motor neuron - stroke
            a. when closing eyes - eyes close with perhaps slight weakness, flat nasolabial fold.
            b. when raising eyebrows - forehead wrinkled, eyebrow raised, paralysis of lower face.
7. 8th cranial nerve (CN-VIII): Vestibulocochlear
    a. Function
        1. hearing
    b. test hearing as directed in handout on examination of the ear (EENT)
        1. Whisper test
        2. Weber/Rinne tests
8. 9th & 10th cranial nerves: CN-IX Glossopharyngeal, CN-X Vagus
    a. Function
        1. CN-IX: sensory - posterior ear drum/canal, pharynx, and taste to posterior 1/3 of tonguMotor - pharynx
        2. CN-X: sensory - pharynx & larynx. Motor - soft palate, pharynx, and larynx/vocal cords.
    b. Test for
        1. sensation/taste to posterior tongue
        2. vocal quality
        3. observe upward movement of posterior oropharynx and symmetry
        4. stimulate gag reflex on each side with cotton swab
        5. ability to elevate palate

9. 11th cranial nerve (CN-XI): Spinal accessory nerve
    a. Function
        1. Motor - upper portion of sternocleidomastoid and trapezius muscles
    b. Test for
        1. ability to turn head side to side
        2. ability to shrug shoulders upwards against resistance
        3. observe for atrophy or fasciculations in trapezius muscles
10. 12th cranial nerve (CN-XII): Hypoglossal nerve
    a. Function
        1. motor to tongue
    b. Test for function
        1. symmetry, atrophy, or fasciculations
        2. have patient move tongue side to side
        3. have patient stick tongue out, should not deviate from midline
        4. have patient puff out cheeks and examiner pushes against them from outside noting strength.

b. Motor system/cerebellar system
    1. Inspection
        a. Ask pt to walk across room, down hall, turn and come back.
        b. Observe posture.
        c. Note presence of atrophy, fasciculations, involuntary movements.
        d. Type of involuntary movements
            1. Tremors
                a. resting tremors - predominate at rest and decreases or disappears with voluntary movement. Typical of Parkinsonism.
                b. intention tremors - appears when affected part is actively maintaining posture. Fine tremor in hyperthyroidism. Tremor in fatigue and anxiety.
                c. postural tremors - appears when affected part is actively maintaining a posture. Fine tremor in hyperthyroidism, tremor in fatigue and anxiety. Most common in benign essential, often worsens with intention.
            2. Fasciculations - fine, rapid, flickering or twitching movements originating in relatively small groups of muscle fibers. Unlike tremors, seldom move a joint.

3. Tics - brief, repetitive, stereotyped, coordinated movements occurring at regular intervals.
4. Chorea - brief, rapid, jerky movements. Occur at rest or can interrupt movements.
5. Athetosis - slower, more twisting and writhing than chorea. Have a larger amplitude. Most common in face and distal extremities.
6. Dystonia - similar to athetoid movements. Involve larger portions of body including trunk. Grotesque, twisted postures may result. Can be induced by a class of drugs (i.e.. anti emetics such as Compazine).

e. Special maneuvers
   1. heel to toe walking in a straight line
   2. walk on toes
   3. walk on heels
   4. Romberg test - Have pt stand with heels and feet together, arms at sides and eyes closed. Observe for loss of position sense and tendency to fall.
   5. Pronator drift - Often combined with Romberg. Have pt hold arms in front with palms up. Have pt close eyes and maintain arm position for 20-30 seconds. A tendency for an arm to pronate suggest a mild hemiparesis. Next, tap arms briskly downward. A return to previous position indicates muscle strength, coordination, and good position sense.
   6. Hop in place on each foot. This indicates intact lower extremity motor systems, cerebellar function and position sense.

Techniques and examination

1. Assessment of muscle tone
   a. Passive range of motion (with pt relaxed, perform range of motion to limbs for each joint.)
      1. Note rigidity, increased/decreased resistance, cogwheel type motion
2. Testing muscle strength
   a. Test specific motor groups
   b. Have patient actively resist your attempts to flex or extend across specific joints.
   c. Grade muscle strength on scale of 0-5.
      1. 0 = no muscular contraction noted

2. 1 = barely detectable flicker of contraction
3. 2 = active movement of body part with gravity
4. 3 = active movement against gravity
5. 4 = active movement against gravity with some resistance
6. 5 = active movement against full resistance & without any evidence of fatigue (normal muscle strength)

d. Impaired strength is called weakness or plegia.

3. Assessment of coordination
   a. Cerebellar
      1. Rapid rhythmic alternating movements of hands. Have patient pat his thighs, turn hands over and back or touch each finger with thumb of same hand as rapidly as possible. In cerebellar disease, one movement can not be followed by the opposite movements. Movements are slow, irregular, and clumsy.
      2. Point to point testing. Have patient alternately touch tip of his nose and tip of your index finger as you reposition your hand to different places in front of the patient.
      3. Rapid rhythmic alternating movements of the feet. Have patient tap your hand with ball of each foot in turn as rapidly as possible.
      4. Heel-shin maneuver. With the patient supine, ask him to run the heel of one foot down the shin of their other leg from the knee to the big toe. This is point to point testing of the lower extremity.

Sensory system

a. General principles
   1. Note ability to perceive stimulus
   2. Compare sensation
   3. When testing pain, with temperatures and touch, compare distal and proximal areas of extremities.
   4. When testing vibration and position, first test fingers and toes (distal areas). If normal, you may assume proximal areas are normal.
   5. Scatter stimuli to cover most dermatones and major peripheral nerves.
   6. Vary the placement of your exam.
   7. Map areas of altered sensation by preceding in a stepwise fashion outwards until patient detects change.

b. Pain
   1. Use sharp/dull areas of a safety pin.
   2. Use light pressure.
   3. Terms
      a. analgesia - absence of pain

c. Temperature (may omit if pain sensation is normal)
   1. Use 2 test tubes filled with hot and cold water.
   2. Place lightly on skin and have patient distinguish hot/cold.

d. Light touch
    1. Touch skin lightly with wisp of cotton and ask patient to respond.
    2. Compare sides.
    3. Terms
        a. anesthesia - absence of touch sensation.
e. Vibration
    1. Strike low pitched tuning fork (128 hz or 256 hz) and place over distal interphalangeal joint to toe and finger.
    2. Ask patient if he feels vibration.
    3. Proceed proximally on bony prominences if impaired vibration sense.
f. Position sense
    1. Grasp patients great toe on the side and move it upwards or downwards.
    2. Ask patient to identify position.
    3. Perform to fingers, wrist, elbows, etc.
g. Sterognosis - ability to ID objects in hand.
    1. With patients eyes closed, place object in hand.
    2. Ask patient to identify object.
h. Two point discrimination - Use the ends of an open paper clip.
    1. Touch the finger pads in two locations, alternating with a single touch.
    2. See if the patient can tell the difference and determine the distance at which they can tell it is two points.
    3. Normally less than 5.0 mm on the finger pads.
    4. Important test for finger lacerations as it will find minimal nerve damage.

Reflexes - grade reflexes on a scale of 0 to 4+ or -

a. Four plus (4+) = very brisk, hyperactive
b. Three plus (3+) = brisker than normal
c. Two plus (2+) = normal
d. One plus (1+) = diminished, requires reinforcement maneuvers
e. Zero (0) = absent, no response
    1. Biceps reflex (C-5, C-6)
        a. With arm partially flexed at elbow, with palm down.
        b. Identify biceps tendon and place thumb firmly on tendon.
        c. Strike your finger or thumb with the hammer as though striking a digit.
        d. Observe flexion at elbow and feel contraction of muscle.
    2. Triceps reflex (C-6, C-7)
        a. Flex patients arm at elbow at elbow with palm down.
        b. Strike tendon directly above elbow, with direct blow.
        c. Observe for extension at elbow and contraction of muscle.
    3. Brachioradialis (supinator) reflex (C-5, C-6)
        a. With the patients forearm resting with palm down in lap or abdomen.

   b. Strike radius 1-2 inches above wrist.
   c. Observe for flexion and supination of forearm.
4. Patellar (knee) reflex (L-2, L-3, L-4)
   a. Have the patient seated with leg hanging free or supine with knees flexed and supported by examiners arm.
   b. Briskly tap patellar tendon just below patella.
   c. Note extension at knee and contraction of quadriceps.
5. Ankle (achilles) reflex (S-1)
   a. Have the patient slightly flex knee. the examiner dorsiflexes relaxed foot at ankle.
   b. Strike the achilles tendon.
   c. Note plantar flexion and sped of muscular contraction.

DIAGRAMS OF THE NEUROLOGICAL SYSTEM

Your Command: Student Handout, Pharmacy

GAIN ATTENTION: During normal routine the CA will be called upon to properly prescribe and dispense medications in the proper manner.

PURPOSE: The purpose of this lesson is to familiarize the student with common medications and the trade name, indications, contraindications, side effects and dosage of those medications.

INTRODUCE LEARNING OBJECTIVES:

A. TERMINAL LEARNING OBJECTIVE: Given the need to prescribe and dispense medications, the student will be able to do so in the proper manner.
B. ENABLING LEARNING OBJECTIVES:
    1. Be able to identify generic and trade names of meds by selecting the correct response.
    2. Be able to identify the indications and contraindications of a specified medication by selecting the correct response.
    3. Be able to identify the side effects of any medication by selecting the correct response.
    4. Be able to identify dosages of meds by selecting the correct response.
    5. Be able to identify different classifications of meds by selecting the correct response.
C. The instructor will give this class by lecture and demonstration.
D. This material will be covered on a daily quiz and the final oral exam.

The dispensing of any medication to a patient must be accompanied by an understanding of that medication. Even properly prescribed medications can cause side effects ranging from mild discomfort to potentially fatal consequences.
Note: <u>If you do not know what is in a medication, how, why and when to use it, and what the side effects are, then you should not use that medication</u>.

OUTLINE SEQUENCE

I. DRUG CLASS
    A. **Generic name and type of medication**. *(Trade name)* Most medications have a trade name (i.e. Tylenol) along with the generic name (i.e. Acetaminophen).
        1. Indications:
            i. The specific reason(s) the medication should be prescribed for.
        2. Contraindications:
            i. The specific reason(s) the medication should <u>not</u> be prescribed for.

3. Side Effects:
    i. All medications cause effects other than those desired such as an upset stomach when taking aspirin. Some are serious, others are mild. A knowledge of possible side effects before giving a medication can save you and the patient problems later.
4. How to take this medication: Special instructions that the patient should know while taking this medication (i.e. eat food when taking Motrin).
5. Dosage:How much, how often and for how long should the medication be given.

B. Medications in this class of drugs available at FCAC

NON-NARCOTIC ANALGESICS, ANTI-INFLAMMATORY and ANTIPYRETIC DRUGS

A. **Aspirin** *(ASA, Ecotrin)* Aspirin is the most economical analgesic, atipyretic, and anti-inflammatory agent available. Some preparations have an antacid-type buffer to assist in the reduction of gastric irritation.
    1. Indications
        i. Relief of mild to moderate pain.
        ii. Control of inflammation.
        iii. Control of fever.
    2. Contraindications
        i. Hypersensitivity and/or history of allergic reaction to other anti-inflammatory medications.
        ii. Peptic ulcer disease.
        iii. Scheduled for surgery or tooth extraction.
        iv. Bleeding disorders, if on anticoagulant medications, or during the last three months of pregnancy.
    3. Side Effects
        i. Most commonly GI: nausea/vomiting, gastritis, GI bleed, usually reduced if taken with meals.
        ii. Tinnitus/vertigo
        iii. Anaphylaxis
        iv. Decreases platelet aggregation and increases bleeding time.
    4. How to take this medication: Take with food or after meals to prevent stomach upset. Take with a full glass of water to help swallow the medication. Sustained release or long lasting preparations must be swallowed whole. Do not crush or chew them or the sustained activity may be destroyed and side effects increased.
    5. Dosage:Adults 650 mg q4° with food.

B. **Ibuprofen** *(Motrin)*
   1. Indications
      i. Relief of mild to moderate pain and reduces inflammation.
      ii. Used to treat headaches, muscle aches, dental pain, menstrual cramps and athletic injuries.
      iii. Used to treat pain, swelling and stiffness associated with arthritis.
      iv. May also be used to reduce fever.

SOAP Note

LTG #

Allotted Lesson Time:

References: Nursing Procedures Manual
HM 3&2

Terminal Learning Objective: Given a simulated patient with a simulated complaint, the student will be able to obtain the needed information for proper treatment of the patient.

Enabling Learning Objective: Given a list of components of a SOAP note, select by shading the correct response.

a. The information charted for each component.
b. The proper way of obtaining the information for each component.

Problem oriented medical record approach (POMR)

The S.O.A.P.(E. R.) method is the only accepted method of medical record entries for the military.

a. **S:** (subjective) - What the patient tells you.
b. **O:** (objective) - Physical findings of the exam.
c. **A:** (assessment) - Your interpretation of the patients condition.
d. **P:** (plan) - Includes the following:
    1. Therapeutic treatment: includes use of meds, use of bandages, etc.
    2. Additional diagnostic procedures: any test which still might be needed.
e. **E:** (patient education) - special instructions, handouts, use of medications, side effects, etc.
f. **R:** (return to clinic) - when and under what circumstances to return.

Components of the SOAP note.

1. Medical History - Gives you an idea of the patients problem before you start physical exam.
    a. biographic data
    b. chief complaint
        1. This is the reason for the patients visit.
        2. Use direct quotes from patient.
        3. Avoid diagnostic terms.
    c. Observation: begins as soon as the patient walks through the door.

   d. Listening: listen carefully. This will help you get an accurate diagnosis of the problem.
   e. Open ended questions: help you to get more complete and accurate information.
   f. Provider obstacles: your attitude or predeterminations may prevent you from making an accurate judgment.
   g. Patient obstacles: the patient has many obstacles to overcome. Patients must have confidence in you.
2. History of present illness/injury (HPI)
   a. Duration: when the illness/injury started.
   b. Character: use the patients words to note character of pain.
   c. Location: have the patient explain, then have them point it out.
   d. Exacerbation or remission: what makes it better or worse and is it constant or does it vary in intensity.
   e. Positional pain: does the pain vary with the change of the patients position.
   f. Medications/allergies: note any medications whether over the counter or not. Do the medications relate to the problem? Take note of the patients allergies. Do not rely on the patients health record or SF 600.
   g. Pertinent facts: facts which lead you to your diagnosis. Usually consist of classical signs and/or symptoms.

ANOTHER FASTER WAY TO TAKE A MEDICAL HISTORY IS BY USING THE KEY WORD "SAMPLE PQRST"

S: Symptoms
A: Allergies
M: Medicine taken
P: Past history of similar events
L: Last meal
E: Events leading up to illness or injury

P: Provocation/Position - what brought symptoms on, where is pain located.
Q: Quality - sharp, dull, crushing etc...
R: Radiation - does pain travel
S: Severity/Symptoms Associated with - on scale of 1 to 10, what other symptoms occur
T: Timing/Triggers - occasional, constant, intermittent, only when I do this. (activities, food)

EXAMPLE:

S) 21 y/o male c/o sore throat. No known allergies. Taking no meds. Have approx (2) ST per year. Eating and drinking normally. Was fine until yesterday morning when woke up with ST. Denies fevers, chills, sweats, SOB, & HA.

3. Past History (PH)
    a. Other significant illnesses
    b. Prior admissions
    c. History of major trauma
    d. Surgery
    e. Childhood illnesses
    f. Neurological history
4. Family History
    a. This is the pertinent history of diseases of the family within the patients bloodline.
    b. Any disease traced through the family is important. If no history found, note it on SF600.
5. Social History (SH)
    a. Drugs
    b. ETOH
    c. Tobacco
    d. Over the counter medications
6. Marital History
    a. Assist by assessing patients current condition.
    b. May help diagnose an underlying physical or psychological problem.
7. Occupational History (OH)
    a. This is a brief description of the patients job.
    b. This is of importance if the patient works around hazardous materials and chemicals.
8. Systems Review (ROS)
    a. A comprehensive account of complaints, both past and present.
    b. Double check: Recheck your work to prevent omission of significant data.
    c. Diagnosis: a systems review will allow the examiner to group the symptoms and arrive at a logical diagnosis.

<u>Review of Systems</u>

    d. General
        1. usual weight
        2. weight change
        3. weakness, fatigue, fever

e. Skin
    1. rashes
    2. lumps
    3. itching
    4. dryness
    5. color changes
    6. hair and nails
f. Head
    1. headache
    2. head injury
g. Eyes
    1. vision
    2. corrective lens use; type
    3. last eye exam
    4. pain
    5. redness
    6. tearing
    7. double vision
h. Ears
    1. hearing
    2. tinnitus
    3. vertigo
    4. pain, earache
    5. infection
    6. discharge
i. Nose & Sinuses
    1. frequent colds, nasal stuffiness
    2. hay fever, atopy
    3. nosebleeds
    4. sinus trouble
j. Mouth & Throat
    1. teeth and gums
    2. last dental exam
    3. sore tongue
    4. frequent sore throat
    5. hoarseness
k. Neck
    1. lumps in neck
    2. pain
l. Breasts
    1. lumps
    2. nipple discharge
    3. pain
    4. self-exam

m. Respiratory
    1. cough
    2. sputum (color, quantity)
    3. hemoptysis
    4. wheezing
    5. asthma
    6. bronchitis
    7. pneumonia
    8. TB, last PPD
    9. pleurisy
    10. last CXR
n. Cardiac
    1. heart trouble
    2. HTN
    3. rheumatic fever
    4. heart murmurs
    5. dyspnea/orthopnea
    6. edema
    7. chest pain/palpitations
    8. last EKG
o. Gastrointestinal
    1. trouble swallowing
    2. heartburn
    3. appetite
    4. nausea
    5. vomiting
    6. vomiting blood
    7. indigestion
    8. frequency of BM's, last BM, change in habit
    9. rectal bleeding or tarry stools
    10. constipation
    11. diarrhea
    12. abdominal pain
    13. food intolerance
    14. excessive belching or farting
    15. hemorrhoids
    16. jaundice, liver or gall bladder trouble, hepatitis
p. Urinary
    1. frequency of urination
    2. polyuria
    3. nocturia
    4. dysuria
    5. hematuria
    6. urgency, hesitancy, incontinence

7. urinary infections and STD's
8. stones (renal calculi)

q. Genito-reproductive
    1. MALE
        a. discharge from or sores on penis
        b. STD hx and treatment, Last HIV test
        c. hernias
        d. testicular pain or masses
        e. frequency of intercourse, libido, difficulties
    2. FEMALE
        a. 1st menarche, regularity, frequency
        b. flow duration, amount
        c. bleeding between periods or after intercourse
        d. last PAP, results
        e. number of pregnancies, deliveries, abortions (spontaneous & induced)
        f. STD's hx and treatments, Last HIV test
r. Musculoskeletal
    1. joint pain/stiffness, arthritis, bachache.
    (describe location and swelling, redness, pain, weakness, ROM)
    2. past injuries, treatments
s. Neurologic
    1. fainting, blackouts, seizures, paralysis, weakness, numbness, tingling, tremors, memory
t. Psychiatric
    1. mood, affect
    2. nervousness, tension, depression
    3. past care
u. Endocrine
    1. thyroid trouble
    2. heat or cold intolerance
    3. excessive sweating, thirst, hunger, urination
    4. diabetes
v. Hematologic
    1. anemia
    2. ease of bruising, bleeding
    3. past transfusions and any reactions

Taking a Medical History

Basic's: Allow the patient to talk. Do not interrupt. When patient is finished then ask open ended type questions. Always ask: Is there anything else?

There are many methods and guides used for history taking and as time goes by you will develop your own style. Below are examples of a Medical History:

Classical Medical History

1. Chief Complaint: chronological narrative of problem.
    a. onset
    b. quality
    c. severity
    d. timing (duration, frequency)
    e. what makes worse/better
    f. associated manifestations
2. Past Medical History
    a. general state of health
    b. childhood illnesses
    c. immunizations
    d. adult illnesses
    e. psychiatric illnesses
    f. surgeries
    g. injuries
    h. hospitalizations
    i. ALLERGIES
3. Current Medications
4. Diet
5. Sleep Pattern
6. Habits
    a. smoking
    b. dipping
    c. ETOH intake
7. Family History
    a. HTN
    b. TB
    c. HA
    d. Stroke
    e. heart disease
    f. diabetes
    g. mental illness

8. Psychosocial History
    a. life style, home situation, significant others
    b. school
    c. job
    d. financial
    e. recreation
9. Review of Systems
    a. General
        1. usual weight
        2. weight change
        3. weakness, fatigue, fever
    b. Skin
        1. rashes
        2. lumps
        3. itching
        4. dryness
        5. color changes
        6. hair and nails
    c. Head
        1. HA
        2. head injury
    d. Eyes
        1. vision
        2. corrective lens use; type
        3. last eye exam
        4. pain
        5. redness
        6. tearing
        7. double vision
    e. Ears
        1. hearing
        2. tinnitus
        3. vertigo
        4. pain, earache
        5. infection
        6. discharge
    f. Nose & Sinuses
        1. frequent colds, nasal stuffiness
        2. hay fever, atopy
        3. nosebleeds
        4. sinus trouble

g. Mouth & Throat
    1. teeth and gums
    2. last dental exam
    3. sore tongue
    4. frequent sore throat
    5. hoarseness
h. Neck
    1. lumps in neck
    2. pain
i. Breasts
    1. lumps
    2. nipple discharge
    3. pain
    4. self-exam
j. Respiratory
    1. cough
    2. sputum (color, quantity)
    3. hemoptysis
    4. wheezing
    5. asthma
    6. bronchitis
    7. pneumonia
    8. TB, last PPD
    9. pleurisy
    10. last CXR
k. Cardiac
    1. heart trouble
    2. HTN
    3. rheumatic fever
    4. heart murmurs
    5. dyspnea/orthopnea
    6. edema
    7. chest pain/palpitations
    8. last EKG

l. Gastrointestinal
    1. trouble swallowing
    2. heartburn
    3. appetite
    4. nausea
    5. vomiting
    6. vomiting blood
    7. indigestion
    8. frequency of BM's, last BM, change in habit
    9. rectal bleeding or tarry stools
    10. constipation
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ANOTHER FASTER WAY TO TAKE A MEDICAL HISTORY IS BY USING THE KEY WORD "SAMPLE PQRST"

S: Symptoms
A: Allergies
M: Medicine taken
P: Past history of similar events
L: Last meal
E: Events leading up to illness or injury

P: Provocation/Position - what brought symptoms on, where is pain located.
Q: Quality - sharp, dull, crushing etc...
R: Radiation - does pain travel
S: Severity/Symptoms Associated with - on scale of 1 to 10, what other symptoms occur
T: Timing/Triggers - occasional, constant, intermittent, only when I do this. (activities, food)

EXAMPLE:

S) 21 y/o male c/o sore throat. No known allergies. Taking no meds. Have approx (2) ST per year. Eating and drinking normally. Was fine until yesterday morning when woke up with ST. Denies fevers, chills, sweats, SOB, & HA.

Thorax, Lungs, and Respiratory Disorders

Allotted time:

Instructional references:

Instructional aids:

1. visual aid panel
2. transparencies
3. student handout

Terminal learning objective: Given a simulated patient with simulated symptoms, the student will be able to recognize and correctly examine the patient using proper procedure.

Enabling learning objective:

1. Identify proper land marks of the thorax and lungs.
2. Properly inspect, palpate, percuss, and auscultate.
3. Identify breath sounds.
4. Identify the different respiratory disorders.
5. Be able to differentiate between the different types of pneumonia.
6. Identify the signs and symptoms of common respiratory disorders.
7. Identify the treatment of common respiratory conditions.

1. Landmarks - anatomical structures
    a. Anterior
        1. mid sternal line - vertical - down center of sternum.
        2. right and left midclavicular line - midpoint of clavicle.
        3. right and left anterior axillary line.
        4. suprasternal notch - top of sternum.
        5. sternal angle - where the manubrium and sternum meet.
        6. xiphoid process - distal to sternum.
    b. Lateral
        1. right and left anterior axillary line.
        2. mid axillary - vertical from apex of axilla.
        3. posterior axillary line - vertical from posterior axillary fold.
    c. Posterior
        1. right and left posterior axillary lines.
        2. right and left scapula line - vertical from inferior angle of scapula.
        3. vertebral line - vertical along spinous processes.

d. Lungs
    1. apex 2-4 cm above inner one-third of clavicle
    2. inferior anterior border - crosses 6th rib at midclavicular line and 8th rib at mid axillary line.
    3. inferior posterior border - at level of 10th thoracic spinous process (T-12 at deep inspiration)
    4. Tracheal bifurcation - left and right mainstem bronchus at sternal angle (anterior) and T-4 (posterior)
    5. Five lobes of the lungs - left upper lobe (LUL), left lower lobe (LLL), right upper lobe (RUL), right middle lobe (RML), and right lower lobe (RLL). These will vary in position and size during phases of respiration.
    6. Lingula is part of the lung that lies adjacent to the heart.

2. Exam Techniques
    a. General approach
        1. Thorax exposed in good lighting, undressed to waist.
        2. Proceed in order - inspect, palpate, percuss, and auscultate.
        3. Try to visualize underlying tissue.
    b. Survey of thorax and respiration
        1. Patients color
        2. Shape of fingernails
        3. Position of trachea
        4. Respiratory distress
        5. Observe rate and rhythm and effort of breathing
        6. Inspect next for supraclavicular retractions or sternocleidomastoid contractions
        7. Listen to breathing
        8. Observe shape of chest
    c. Exam
        1. Inspection
            a. Deformities or asymmetries
                1. kyphosis (hunchback)
                2. lordosis (backward curvature of spine)
                3. scoliosis (s-shaped lateral curvature of spine)
                4. pectus carinatum (pigeon chest)
                5. pectus excauatum (caved in chest)
                6. barrel chest (increased anterior - posterior diameter)
            b. slope of ribs
                1. more horizontal in emphysema, severe asthma or airway obstruction.
            c. intercostal retractions during inspirations
                1. severe asthma, emphysema or laryngeal/tracheal obstruction

d. local bag or impaired respiratory motion - underlying pleural or lung disease.

3. Palpation of the chest
    a. Uses
        1. identifies areas of tenderness
        2. assessment of observed abnormalities
        3. assessment of respiratory excursion - (lag or impaired inspiration)
    b. Technique
        1. place thumb level/parallel to 10th ribs bilaterally
        2. grasp lateral rib cage with hands
        3. patient inhales deeply
        4. watch movement of thumbs
4. Technique to elicit vocal or tactile fremitus
    a. fremitus refers to palpable vibrations transmitting through the chest wall.
    b. technique
        1. use ball of hand
        2. ask patient to repeat the words "blue moon", "one on one", or "ninety-nine".
        3. palpate and compare symmetrical areas
    c. Fremitus decreased in
        1. bronchial obstruction
        2. soft voice intensity
        3. pleural space disease
        4. pneumo thorax
        5. COPD
        6. infiltrating tumor
        7. very thick chest wall
    d. Fremitus increased
        1. near large bronchi
        2. over consolidated lung
5. Identification of level of diaphragm
    a. using ulnar side of hand, place at expected level
    b. move hand up and down until fremitus no longer felt
    c. this approximates level of the diaphragm
6. Percussion of the chest
    a. General principles
        1. sets wall/underlying tissue in motion
        2. produces audible sounds/palpable vibrations
        3. aids in determining if underlying tissue is:
            a. air filled
            b. fluid-filled
            c. solid
        4. Penetrates approximately 5-7 cm into chest.
    b. Technique

1. Hyperextend middle finger and place distal phalanx and D.I.P. joint firmly on surface to be percussed. Avoid contact with other part of hand.
2. Partially flex the middle finger (plexor) of the other hand with hand locked upwards.
3. Strike pleximeter finger at the base of the distal phalanx quick and sharp with the plexor movement should be at the wrist not finger.
4. Remove striking finger quickly.
5. Strike 2-3 times in each exam area.
6. Compare one part of chest with opposite side.

c. Five basic percussion notes
    1. Flatness
        a. soft intensity
        b. high pitch
        c. short duration
        d. example/location-thigh
        e. seen with large pleural effusion
    2. Dullness
        a. medium intensity
        b. medium pitch
        c. medium duration
        d. example/location - liver
        e. seen with lobar pneumonia
    3. Resonance
        a. loud intensity
        b. low pitch
        c. long duration
        d. example/location - normal lung
        e. bronchitis
    4. Hyperresonance
        a. very loud
        b. low pitch
        c. clonger duration
        d. example/location - normally none
        e. emphysematous lung, pneumothorax
    5. Tympany
        a. loud
        b. high pitch
        c. variable duration
        d. example/location - gastric air bubble
        e. large pneumothorax
d. Areas to percuss
    1. across top of each shoulder
    2. downward in intervals between scapulas to level of diaphragm

3. areas lateral to mid-scapular lines
4. describe abnormal percussion
5. identify diaphragmatic level

e. Auscultation of the chest
   1. Principles of exam
      a. use diaphragm of stethoscope
      b. use same locations as percussion
      c. listen to one full breath in each area
      d. watch for hyperventilation, faintness and light-headedness
      e. auscultate side to side so that right to left comparison is made

f. Auscultate breath sounds
   1. Intensity - decreased with shallow breath respirations, thick chest (obesity), COPD, decreased transmission as in pleural effusion or pneumothorax.
   2. Pitch and duration of breath sounds.
      a. Are sounds during inspiration/expiration, or both?
      b. Normal distribution of sounds?
      c. Normal sounds in abnormal places?
   3. Adventitious sounds - crackles wheezes or rubs.
      a. location
      b. location in which phase
   4. Breath sounds/auscultation - patient always breaths through the mouth.
      a. normal breath sounds
         1. vesicular sounds
            a. low in pitch of expiration
            b. soft in intensity
            c. normal location throughout most of lungs away from trachea/large bronchi
            d. last longer during inspiration
         2. Bronchial sounds
            a. high in pitch
            b. loud in intensity
            c. normal location near larger airway
            d. expiratory sounds equal or longer
         3. Bronchovesicular sounds
            a. intermediate pitch
            b. intermediate intensity
            c. normal location is the 1st and 2nd interspace and between scapula
            d. equal on inspiration/expiration
         4. Tracheal sounds
            a. relatively high in pitch

b. very loud in intensity
c. normal location is over trachea in neck
d. equal on inspiration and expiration

b. Adventitious sounds - note timing in cycles
1. Crackles (or rales)
a. dry or moist crackling sounds
b. may occur during inspiration or both
c. discrete non continuous sounds
d. noted in pneumonia, pulmonary edema, luminary fibrosis
e. Two types
1. fine crackles - soft high pitched
2. coarse crackles - somewhat louder, lower in pitch
2. Rhonchi - coarse, low pitch snoring sounds
3. Wheezes
a. musical, higher pitched, hissing or shrill
b. may be expiratory or inspiratory
4. Pleural rubs
a. loud, rubbing quality
b. localized
c. often inspiratory and expiratory

c. Voice sounds: More valuable in detecting consolidation, infarction, or etelectosis. Normally faint and indistinct except over bronchi.
1. Egophony - pt says "EEE", you hear "Ay". This is due to increased transmission through consolidated or airless lungs.
2. Whispered pectoriloquy - whispered sounds heard more clearly through consolidated lung tissue.
3. Bronchial breath sounds in peripheral areas.
4. Bronchophony - louder, clearer voice sounds because of increased transmission of high pitched components.

7. Exam of anterior chest
a. Inspection
1. rate, rhythm, effort of respirations
2. listen to breathing
3. shape/movement of the chest
4. width of costal angle
5. retraction of interspaces with inspiration
6. local lag/impaired respiratory

b. Palpation
    1. Hands are placed along costal margin with fingers lateral along border of rib cage.
        a. observe symmetry, range of excursion
    2. Tactile/vocal fremitus
        a. utilize same technique as described previously
        b. compare symmetric areas
c. Percussion
    1. Same technique as described previously
d. Auscultation
    1. listen to breath sounds
        a. note intensity
        b. variations of normal breath sounds
        c. bronchial breath sounds over large airways
        d. added sounds
    2. May have your patient breath hard and fast through open mouth.

8. Clinical assessment of pulmonary function
    a. Ambulate patient down hall or climb stairs
        1. assess complaint
    b. Match test
        1. Hold lighted match 6 inches from patients mouth and have patient blow out match with open mouth.
        2. Inability indicates severe obstruction
9. Abnormalities in rate and rhythm
    a. Rapid, shallow breathing (tachypnea)
        1. Has numerous causes
    b. Rapid, deep breathing (hyperpnea) (hyperventilation)
        1. May be due to exercise, anxiety.
    c. Slow breathing (bradypnea)
        1. diabetic coma, respiratory depression
    d. Cheyne-Stokes breathing
        1. Alternating periods of deep breathing with periods of apnea
        2. May be due to heart failure, respiratory depression

5. Basic diseases of the lower respiratory tract.
    a. Basic examination
        1. pt should be undressed to waist
        2. proceed in order
        3. inspection, palpation, percussion and auscultation
        4. compare sides
        5. work from top to bottom

b. Try to visualize underlying tissues and organs
    1. pt sitting: examine posterior thorax and lungs
    2. pt standing: examine anterior thorax and lungs

6. Disorders

. Pneumonia: an acute infection of the alveolar spaces and/or interstitial tissue of the lungs

0. Pneumococcal Pneumonia (streptococcus pneumonia) most common causes of lobar pneumonia.
    a. Signs and Symptoms
        1. proceeded by URI
        2. sudden onset/rapid progression
        3. sharp pain in the involved hemi thorax
        4. productive cough with yellow green, gray, or rusty colored sputum
        5. dyspnea, tachycardia
        6. shaking chills, fever
        7. pleural friction rubs
        8. patient most comfortable lying on affected side
        9. rales in affected lobes
    b. Diagnosis
        1. Should be suspected when:
            a. pt exhibits any of above symptoms
            b. diagnosis supported by physical exam
            c. chest X-ray, CBC, and if possible - sputum C&S
    c. Refer to MO if you suspect pneumonia
    Other bacterial pneumonias
1. Chlamydia pneumonia - fever, previous URI, non-productive cough, mild to moderate illness, normal WBC, minimal physical findings. Small segmental infiltrates on chest X-ray.
2. Haemophilus influenza - patient is moderately ill.
3. Legionella pneumonia - very severe illness. High fever, non-productive cough, chest pain, neurolgic changes, G.I. disturbances.
4. Mycoplasma pneumonia - slow onset, headache, malaise, fever, scratchy sore throat, dry cough. Mild and self limited, will resolve in 2-4 weeks without treatment. X-ray may show patchy infiltrates. Might have some crackles or isolated wheezing.

a. Bronchitis - inflammation of the trachea and bronchial tree.
    0. Etiology
        . may develop following a cold or other viral infections
        a. exposure to pollutants and other irritants
    1. Signs and symptoms
        . proceeded by URI
        a. malaise, fever, muscle pain, sore throat
        b. cough: initially dry and non-productive followed by sputum which may become abundant and mucopurulant with a greenish - yellowish color.
        c. may hear rhonchi, but not rales
    2. Diagnosis
        . possible by signs and symptoms
        a. do chest X-ray to rule out other complications
    3. Treatment
        . rest, increase fluids
        a. antipyretics, cough suppressant
        b. bronchodilators (when patient is wheezing)
        c. antibiotics when sputum or fever
b. Asthma - A bronchial hypersensitivity disorder characterized by reversible airway obstruction.
    0. Etiology: Hyperactive airways with attacks of bronchospasms initiated by various factors such as:
        . allergic reactions
        a. inhalation of irritants
        b. exercise
        c. stress
        d. infection
    1. Signs and symptoms
        . wheezing, musical in nature
        a. dyspnea, coughing with sputum
        b. night coughing and wheezing on exertion
    2. Treatment
        . refer to MO
        a. acute attack requires aggressive treatment
        b. bronchodialators required for treatment
c. Pleurisy - pain secondary to inflammation of the pleura (pleuritis).
    0. Etiology
        . pleural injury
        a. entry of infectious agent
        b. pleural trauma
        c. pulmonary embolism
    1. Signs and symptoms

. sudden onset
a. pain which is increased by coughing and breathing
b. may hear pleural friction rub

2. Diagnosis
. characteristics pain
a. X-ray to rule out other causes

3. Treatment
. refer to MO
a. analgesics, bronchodialators and antibiotics
b. treat any other underlying causes