

**UNIVERSITY OF HAWAII  
JOHN A. BURNS SCHOOL OF MEDICINE  
DEPARTMENT OF MEDICINE**

**THIRD-YEAR CLERKSHIP IN  
INTERNAL MEDICINE**

**MEDICINE 532**

**TRAINING PROBLEMS & CORE  
COMPETENCIES HANDBOOK**



Revised 06/05/20

U.H. John A. Burns School of Medicine  
Third-Year Clerkship in Internal Medicine  
**OASIS PATIENT TRACKING  
& TRAINING PROBLEMS CHECKLIST**

**General**

- Logging all your patients is required for JABSOM accreditation and for your clerkship grade.
- Failure to log properly and on a timely basis may lead to serious consequences for JABSOM and for you.
- Log your patients every workday so you do not forget and fall behind.

**Instructions**

- Please follow the guidelines listed by Office of Medical Education here:  
[Oasis Patient Log Instructions](#)

**Training Problems Checklist**

- Your patient logs will populate into your Training Problems Checklist on Oasis
  
- You are **required** to see at least 1 patient with each of the listed **Training Problems (see next page)** during this clerkship. This is the minimum requirement. Your goal, however, should be to see at least **1 inpatient patient** and **1 ambulatory patient** with each of the Training Problems; the more patients you see, the more you will learn. The Training Problem does not have to be the patient's Chief Complaint. In fact, a patient may present with many Training Problems.
  
- Keep track of your patient encounters in Oasis. Indicate which encounters are:
  - **Precepted** – you evaluated the patient independently then staffed the patient with an attending/upper level resident
  - **Observed** – were observed evaluating a patient by an attending or upper level resident
  - **Alternate/ Special activity** – participated in a patient activity that does not count towards either of the above categories
  
- It is your responsibility to ensure that you have fulfilled the Training Problems requirement by the **end of the clerkship**. You are advised to communicate with your team/CMR/Preceptor *as soon as possible* to assist in finding appropriate patients.
  
- At the end of your rotation, you will pull a report of your log & checklist in Oasis. Please present this to your Upper Level Resident, Chief Medical Resident, Hospital Site Coordinator or Preceptor for their signature on the first page.

## TRAINING PROBLEMS CHECKLIST

Below is the list of the 33 Training Problems in your Oasis Patient Tracking Checklist.

|  |
|--|
| 1. Healthy Patient<br>Health promotion, disease prevention and screening<br>(i.e. annual or routine physical exam) |
| 2. Abdominal pain  |
| 3. Altered mental status   |
| 4. Anemia  |
| 5. Back pain   |
| 6. Chest pain  |
| 7. Cough   |
| 8. Dyspnea   |
| 9. Dysuria   |
| 10. Fever  |
| 11. Fluid, electrolyte & acid-base disorders   |
| 12. GI bleeding  |
| 13. Knee pain  |
| 14. Rash   |
| 15. Upper respiratory complaints   |
| 16. Acute MI   |
| 17. Acute renal failure & chronic kidney disease   |
| 18. Common cancers   |
| 19. COPD & Obstructive airways disease   |
| 20. Diabetes mellitus  |
| 21. Dyslipidemias  |
| 22. Heart failure  |
| 23. HIV infection  |
| 24. Hypertension   |
| 25. Liver disease  |
| 26. Major depression   |
| 27. Nosocomial infections  |
| 28. Obesity  |
| 29. Pneumonia  |
| 30. Rheumatologic problems   |
| 31. Smoking cessation  |
| 32. Substance abuse  |
| 33. Venous thromboembolism   |

## TRAINING PROBLEM #1: THE HEALTHY PATIENT: HEALTH PROMOTION, DISEASE PREVENTION, AND SCREENING

### RATIONALE

With growing appreciation for the role of health screening and preventive care in promoting healthier patient outcomes, clinical education must incorporate these advancements. The important interventions related to prevention of cardiovascular disease, cancers and other chronic diseases are emphasized here.

### PREREQUISITES

Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to obtain additional history including a family history and assessment of risk factors.
- Knowledge of the warning signs of common cancers.
- Knowledge of basic criteria and principles of health screening.
- Knowledge of clinical epidemiologic concepts as they pertain to estimation of health risk and quantitative rationale for screening.

### SPECIFIC LEARNING OBJECTIVES:

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The epidemiology and definitions of hypertension, its contribution to cardiovascular risk, the impact of treatment on risk, and current. Recommendations for screening. *(MK)*
2. The epidemiology of hyperlipidemia, its contribution to cardiovascular risk, the reliability of testing modalities, the impact of treatment on cardiovascular risk, and current recommendations for screening. *(MK)*
3. The epidemiology of common cancers, including:
  - Breast cancer, including the efficacy of available screening modalities, impact of early treatment on survival, and current recommendations for screening. *(MK)*
  - Common skin cancers, including the warning signs of melanoma and basal and squamous cell carcinoma. *(MK)*
  - Cervical cancer, including the utility of the Pap smear, impact of early treatment on outcome, and current recommendations for screening. *(MK)*
  - Colorectal cancer, including the utility of available screening methodologies, the impact of early treatment on outcome, and current screening recommendations. *(MK)*
  - Prostate cancer, including the utility of available screening modalities, impact of early treatment on outcome, and current screening recommendations. *(MK)*
4. The risks, benefits, methods, and recommendations for immunizing adults against hepatitis B, influenza, pneumococcal infection, tetanus/diphtheria, and mumps/measles/rubella. *(MK)*
5. Safe sexual practices and risks, benefits, and efficacy of common methods of contraception. *(MK)*
6. Efficacy of seat belt use and proper belt application. *(MK)*
7. Efficacy of exercise and weight loss in prevention of cardiovascular disease and recommended exercise programs. *(MK)*
8. The clinical presentations of substance abuse and basic approaches to prevention and treatment. *(MK)*
9. The impact of smoking on cardiovascular and cancer risk and basic approaches to smoking cessation. *(MK)*

10. Daily caloric, fat, carbohydrate, protein, mineral, and vitamin requirements; adequacy of diets in providing such requirements; evidence of need for supplements (e.g. calcium, antioxidants). *(MK)*
11. The functional status assessment in the geriatric patient and its impact on assuring the best possible functional state. *(MK)*
12. Common environmental and occupational hazards. *(MK)*
13. Controversies and differences that exist in the recommendations for preventive measures and screening. *(MK)*

**B. SKILLS:** Students should demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, including:
  - Dietary intake of fats and cholesterol. *(PC, CS)*
  - Exercise and activity levels. *(PC, CS)*
  - Substance use and its effects, including tobacco, alcohol, and illicit drugs. *(PC, CS)*
  - Psychosocial stresses and environmental risks. *(PC, CS)*
  - Specific cancer risks (e.g. family history, exposures, warning symptoms, preventive efforts). *(PC, CS)*
  - Any high-risk sexual practices. *(PC, CS)*
  - Immunization status appropriate for adults, including:
    - Diphtheria/tetanus for all adults. *(PC, CS)*
    - Influenza vaccine and pneumococcal vaccine for the elderly and those with underlying chronic disease. *(PC, CS)*
    - Rubella for sero-negative women of child-bearing age. *(PC, CS)*
    - Hepatitis B vaccine for medical personnel and other at-risk populations. *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam with features depending on age/sex/race and medical history of an individual, including:
  - Screening skin examination for signs of malignancy. *(PC)*
  - Screening breast examination for a dominant nodule and secondary signs of malignancy. *(PC)*
  - Participation in obtaining a Pap smear. *(PC)*
  - Screening rectal examination that includes palpation of the prostate gland, identification of any nodules, and performance of a stool test for occult blood. *(PC)*
  - Performance of a functional status examination in the geriatric patient *(PC)*
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis using specific history, physical exam, and laboratory findings identified during the screening examination *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend and interpret laboratory tests for screening purposes, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and other tests may include, when appropriate:
  - Complete blood count. *(PC, MK)*
  - Fasting lipid panel. *(PC, MK)*
  - Fasting blood glucose. *(PC, MK)*
  - Urinalysis. *(PC, MK)*
  - Stool test for occult blood. *(PC, MK)*
  - Prostate specific antigen. *(PC, MK)*

Students should be able to define the indications for and interpret (**with consultation**) results of:

- Mammography. (PC, MK)
  - Colonoscopy. (PC, MK)
  - Pap smear. (PC, MK)
  - Bone densitometry. (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate results of the evaluation and counsel for disease prevention. (PC, CS)
  - Elicit questions from the patient and his or her family about the plan. (PC, CS)
6. **Basic and advanced procedural skills:** Students should be able to:
- Perform a urinalysis (dipstick and microscopic). (PC)
  - Stool occult blood testing. (PC)
  - Calculate a BMI. (PC)
  - Perform a functional status examination for elderly patients. (PC)
  - Administer intramuscular injection of a vaccine. (PC)
  - Participate in obtaining a Pap smear. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for healthy patients, including:
- Designing an appropriate work-up for any abnormalities noted on the screening exam. (PC, MK)
  - Teaching breast self-examinations. (PC, CS)
  - Counseling for:
    - Safe sexual practices. (PC, CS)
    - Seatbelt use. (PC, CS)
    - Healthy diet. (PC, CS)
    - Weight loss. (PC, CS)
    - Practical exercise program appropriate to the patient's age, and current physical condition. (PC, CS)
    - Stress management. (PC, CS)
    - Alcohol abstinence. (PC, CS)
    - Smoking cessation. (PC, CS)
    - Cancer screening. (PC, CS)
    - Limiting risks of occupational and environmental hazards. (PC, CS)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to healthy patients. (PC, PLI)
  - Using a cost-effective approach based for screening. (PC, SBP)
  - Incorporating patient preferences. (PC, P)
  - Engaging the patient as an active participant in his/her health care. (PC,P)
- C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:
1. Recognize the importance of regularly screening all patients followed and of teaching all patients about preventive measures. (PC, P)
  2. Appreciate the necessity of keeping detailed records of screening and health maintenance measures. (PC, P)
  3. Understand that physicians and health care delivery organizations are frequently judged by their ability to deliver the highest quality screening and preventive measures. (PLI, P, SBP)
  4. Recognize the importance of addressing community sources of health risk. (PC, P)
  5. Respond appropriately to patients who are nonadherent preventive measures. (CS, P)

6. Respect the patient's right to refuse preventive measures and screening. (*P*)
7. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of screening tests. (*PLI, P*)
8. Demonstrate ongoing commitment to self-directed learning regarding prevention and screening. (*PLI, P*)
9. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in preventative medicine. (*P, SBP*)

**D. RESOURCES:**

- ⇒ USPSTF Recommendation: Screening for Breast Cancer  
**[www.ahcpr.gov/clinic/3rduspstf/breastcancer/brcanrr.htm](http://www.ahcpr.gov/clinic/3rduspstf/breastcancer/brcanrr.htm)**
- ⇒ USPSTF Recommendation: Screening for Cervical Cancer  
**[www.ahrq.gov/clinic/3rduspstf/cervcan/cervcanrr.htm](http://www.ahrq.gov/clinic/3rduspstf/cervcan/cervcanrr.htm)**
- ⇒ USPSTF Recommendations Statement: Counseling to prevent tobacco use and tobacco-caused disease  
**[www.ahrq.gov/clinic/3rduspstf/tobaccoun/tobcounrs.htm](http://www.ahrq.gov/clinic/3rduspstf/tobaccoun/tobcounrs.htm)**
- ⇒ Screening for Prostate Cancer. American College of Physicians. Ann Int Med 1997; 126: 480-484.
- ⇒ Summary of Recommendations for Adult Immunization. Immunization Action Coalition Bulletin. Adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP), August 2005  
**[www.immunize.org/acip](http://www.immunize.org/acip)**

## TRAINING PROBLEM #2: ABDOMINAL PAIN

### **RATIONALE:**

Abdominal pain is a common symptom that can be attributed to a wide variety of acute and chronic disease processes, many of which may represent serious medical problems. Mastery of the approach to patients with abdominal pain is important to third year medical students.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of gastrointestinal and gynecologic anatomy, physiology, and pathophysiology.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Three principal types of abdominal pain:
  - Visceral pain: *(MK)*
    - Poorly localized but site roughly corresponds to dermatome that innervates the affected organ.
    - Characteristics may vary (dull, cramping, burning).
    - Frequently accompanied by secondary autonomic effects (nausea, vomiting, pallor, diaphoresis, restlessness).
    - Patient moves around in an attempt to alleviate discomfort.
  - Somatoparietal or peritoneal pain: *(MK)*
    - More localized and more intense than visceral pain.
    - Arises from peritoneal irritation.
    - Aggravated by movement (patient attempts to lie still).
  - Referred pain: *(MK)*
    - Usually well localized but felt in areas remote to affected organ.
    - May be felt in skin or in deeper tissues.
    - Results from convergence of visceral afferent neurons with somatic neurons from different anatomic regions.
2. Relative likelihood of the common causes of abdominal pain based on the pain pattern and the quadrant in which the pain is located. *(MK)*
3. Diagnostic discrimination between common causes of abdominal pain based on history, physical exam, laboratory testing, and imaging procedures. *(MK)*
4. Symptoms and signs indicative of an acute/surgical abdomen. *(MK)*
5. The influence of age, gender, menopausal status, and immunocompetency on the prevalence of different disease processes that may result in abdominal pain. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an appropriately complete medical history that differentiates among etiologies of disease, including:
  - Chronology. *(PC, CS)*



- Location. (PC, CS)
  - Radiation. (PC, CS)
  - Character. (PC, CS)
  - Intensity. (PC, CS)
  - Duration. (PC, CS)
  - Aggravating or alleviating factors. (PC, CS)
  - Associated symptoms. (PC, CS)
  - Pertinent information about previous abdominal or pelvic surgeries, chronic medical conditions, sexual activity, medications, and family history. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a focused physical exam in patients who present with abdominal pain in order to:
- Establish a preliminary diagnosis of the cause. (PC)
  - Assess the severity of the patient's presenting symptoms and signs (PC)
  - Determine the urgency of implementing diagnostic and treatment plans. (PC)
- The initial physical examination of the patient should include:
- A general assessment of the patient's appearance, position, and degree of discomfort. (PC)
  - Measurement of vital signs, including temperature, pulse, blood pressure, and, when indicated, orthostatic blood pressure and pulse. (PC)
  - Correct order and technique for examining the abdomen. (PC)
  - Inspection of the abdomen for surgical scars, distension, asymmetry or cutaneous abnormalities (dilated veins, ecchymoses, etc.). (PC)
  - Auscultation of the abdomen for abnormal bowel sounds, bruits. (PC)
  - Percussion of the abdomen for detection of hepatomegaly, splenomegaly, abdominal masses, or the presence of ascites. (PC)
  - Palpation of the abdomen for areas of tenderness, signs of peritoneal inflammation, hepatomegaly, splenomegaly, abnormal masses, pulsations, or hernias. (PC)
  - Performance of rectal and pelvic exams (under supervision). (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis of the most important and likely causes of a patient's abdominal pain and recognize specific history, physical exam, and laboratory findings that distinguish between the following diagnoses or conditions:
- Appendicitis. (PC, MK)
  - Cholecystitis (biliary colic). (PC, MK)
  - Pancreatitis. (PC, MK)
  - Diverticulitis. (PC, MK)
  - Peptic ulcer disease including perforation. (PC, MK)
  - Gastroenteritis. (PC, MK)
  - Hepatitis. (PC, MK)
  - Irritable bowel syndrome. (PC, MK)
  - Small bowel obstruction. (PC, MK)
  - Acute mesenteric ischemia. (MK, PC)
  - Inflammatory bowel disease. (PC, MK)
  - Ruptured abdominal aortic aneurysm. (PC, MK)
  - Ureteral stones (renal colic). (PC, MK)
  - Pelvic inflammatory disease. (PC, MK)

- Ruptured ectopic pregnancy. (PC, MK)
- Abdominal wall pain. (PC, MK)
- Referred pain. (PC, MK)

4. **Laboratory interpretation:** Students should be able to interpret specific diagnostic tests and procedures that are commonly ordered to evaluate patients who present with abdominal pain. Test interpretation should take into account:

- Important differential diagnostic considerations including potential diagnostic emergencies. (PC, MK)
- Pre-test and post-test likelihood of disease (probabilistic reasoning). (PC, MK)
- Performance characteristics of individual tests (sensitivity, specificity, positive and negative predictive value, likelihood ratios). (PC, MK)

Laboratory and diagnostic tests should include, when appropriate:

- CBC with differential. (PC, MK)
- UA. (PC, MK)
- Pregnancy test. (PC, MK)
- Stool for occult blood. (PC, MK)
- Hepatic function panel. (PC, MK)
- Amylase and lipase. (PC, MK)
- Abdominal obstructive series. (PC, MK)

Students should be able to define the indications for, and interpret (**with consultation**) the results of:

- Abdominal ultrasound. (PC, MK)
- Abdominal CT scan. (PC, MK)
- Paracentesis fluid studies. (PC, MK)
- Upper gastrointestinal endoscopy. (PC, MK)
- Sigmoidoscopy/colonoscopy. (PC, MK)
- Barium contrast studies. (PC, MK)
- Radionuclide scan of the hepatobiliary system. (PC, MK)

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
- Elicit questions from the patient and his or her family about the management plan. (PC, CS)
- Communicate in lay terms the indications, risk/benefits, and expected outcomes essential to obtaining informed consent for diagnostic and therapeutic procedures commonly used to evaluate and treat patients who present with abdominal pain. (PC, CS)

6. **Basic and advanced procedural skills:** Students should be able to:

- Insert a nasogastric tube. (PC)
- Perform stool occult blood testing. (PC)
- Assist in performing a paracentesis after explaining the procedure to the patient. (PC, CS)

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Recognizing the role of narcotic analgesics and empiric antibiotics in treating selected patients who present with acute abdominal pain. (PC, MK)
- Determining when to consult a gastroenterologist or a surgeon. (PC, SBP)
- Involving a surgeon as soon as possible when a patient is identified as having an acute abdomen. (PC, SBP)

- Selecting various tests and procedures commonly used to diagnose patients who present with symptoms of abdominal pain. ( PC, MK)
- Recommending basic initial management plans for the various causes of abdominal pain listed in the differential diagnosis. (PC, MK)
- Considering the potential value of addressing psychosocial issues in the management of chronic abdominal pain. (PC, MK)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to abdominal pain. (PC, PLI)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for abdominal pain. (PLI, P)
2. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for abdominal pain. (P)
3. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of abdominal pain. (P, SBP)

**D. REFERENCES:**

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Lederle F, Simel D. The rational clinical exam. Does this patient have an abdominal aortic aneurysm? *JAMA*. 1999;281:77-82.

Trowbridge RL, Rutkowski NK, Shojania KG. The rational clinical exam. Does this patient have acute cholecystitis? *JAMA*. 2003;289: 80-86.

## TRAINING PROBLEM #3: ALTERED MENTAL STATUS

### **RATIONALE:**

The diagnosis and management of altered mental status requires a working knowledge of all areas of internal medicine, so varied are the etiologies and corresponding treatment strategies. Internists must master an approach to the problem as they are often the first physicians to see such patients.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Basic course work in physiology, pathophysiology, and neuroanatomy.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The differentiation of delirium, dementia, and depression. *(MK)*
2. The pathophysiology, symptoms, and signs of the most common and most serious causes of altered mental status, including:
  - Metabolic causes (e.g. hyper/hyponatremia, hyper/hypoglycemia, hypercalcemia, hyper/hypothyroidism, hypoxia/hypercapnea, B12 deficiency, hepatic encephalopathy, uremic encephalopathy, drug/alcohol intoxication/withdrawal, and Wernicke's encephalopathy). *(MK)*
  - Structural lesions (e.g. primary or metastatic tumor, intracranial hemorrhage, subdural hematoma). *(MK)*
  - Vascular (e.g. cerebrovascular accident, transient ischemic attack, cerebral vasculitis). *(MK)*
  - Infectious etiologies (e.g. encephalitis, meningitis, urosepsis, endocarditis, pneumonia, cellulites). *(MK)*
  - Seizures/ post-ictal state. *(MK)*
  - Hypertensive encephalopathy. *(MK)*
  - Low perfusion states (e.g. arrhythmias, MI, shock, acute blood loss, severe dehydration). *(MK)*
  - Miscellaneous causes (e.g. fecal impaction, postoperative state, sleep deprivation, urinary retention). *(MK)*
3. The importance of thoroughly reviewing prescription medications over-the-counter drugs, and supplements and inquiring about substance abuse. *(MK)*
4. The risk factors for developing altered mental status, including:
  - Dementia. *(MK)*
  - Advanced age. *(MK)*
  - Substance abuse. *(MK)*
  - Comorbid physical problems such as sleep deprivation, immobility, dehydration, pain, and sensory impairment. *(MK)*
  - ICU admission. *(MK)*
5. The diagnostic evaluation of altered mental status. *(MK)*
6. Indications, contraindications, and complications of lumbar puncture. *(MK)*

7. Principles of management of the common causes of altered mental status. *(MK)*
8. Nonpharmacologic measures to reduce agitation and aggression, including:
  - Avoiding the use of physical restraints whenever possible. *(MK)*
  - Using reorientation techniques. *(MK)*
  - Assuring the patient has their devices to correct sensory deficits. *(MK)*
  - Promoting normal sleep and day/night awareness. *(MK)*
  - Preventing dehydration and electrolyte disturbances. *(MK)*
  - Avoiding medications which may worsen delirium whenever possible
  - (e.g. anticholinergics, benzodiazepines, etc.). *(MK)*
9. The risks of using physical restraints. *(MK)*
10. The risk and benefits of using low-dose high potency antipsychotics for delirium associated agitation and aggression. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of altered mental status including eliciting appropriate information from patients and their families regarding the onset, progression, associated symptoms, and level of physical and mental disability. *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Complete neurologic examination. *(PC)*
  - Mental status examination. *(PC)*
  - Fundoscopic examination. *(PC)*
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology for altered mental status. *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
  - CBC with differential. *(PC, MK)*
  - Electrolytes, BUN/Cr, GLC, hepatic function panel, Ca. *(PC, MK)*
  - ABG. *(PC, MK)*
  - Toxicology screen. *(PC, MK)*
  - VDRL. *(PC, MK)*
  - Vitamin B12 and thiamine measurements. *(PC, MK)*
  - Thyroid function tests. *(PC, MK)*
  - Urinalysis and urine culture. *(PC, MK)*
  - Blood cultures. *(PC, MK)*
  - Cerebrospinal fluid analysis (color, opening pressure, chemistries, cell counts, staining, cultures, cytology, cryptococcal antigen, VDRL). *(PC, MK)*

Students should be able to define the indications for and interpret (**with consultation**) the results of:

- Cranial CT. *(PC, MK)*
- Cranial MRI. *(PC, MK)*
- Electroencephalogram. *(PC, MK)*

5. **Communication skills:** Students should be able to:
  - Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. *(PC, CS)*
  - Elicit questions from the patient and his or her family about the management plan. *(PC, CS)*  
When the patient is unable to communicate, obtain a history from a collateral source such as a family member or other health care proxy. *(PC, CS)*
6. **Basic and advanced procedural skills:** Students should be able to:
  - Obtain an ABG. *(PC)*
  - Assist in performing a lumbar puncture after explaining the procedure to the patient. *(PC, CS)*
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
  - Recognizing that altered mental status in a older inpatient is a medical emergency and requires that the patient be evaluated immediately. *(PC, MK)*
  - Writing appropriate fluid and replacement orders for patients with common electrolyte and metabolic disturbances. *(PC, MK)*
  - Writing appropriate antibiotic orders for the treatment of common infectious etiologies. *(PC, MK)*
  - Ordering appropriate nonpharmacologic and pharmacologic interventions for patients with acute altered mental status with accompanying agitation and aggression. *(PC, MK)*
  - Determining when to obtain consultation from a neurologist or neurosurgeon. *(PC, SBP)*
  - Utilizing hospital and community resources for patients with permanent or disabling conditions to help assist their transfer back to the community or rehabilitation facility. *(PC, SBP)*
  - Using a cost-effective approach based on the differential diagnosis. *(PC, SBP)*
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to altered mental status. *(PC, PLI)*
  - Incorporating patient preferences. *(PC, P)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Appreciate the family's concern and at times despair arising from a loved one's development of altered mental status. *(CS, P)*
2. Appreciate the patient's distress and emotional response to that may accompany circumstances of altered mental status. *(CS,P)*
3. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for altered mental status. *(PLI, P)*
4. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for altered mental status. *(P)*
5. Demonstrate ongoing commitment to self-directed learning regarding altered mental status. *(PLI, P)*
6. Appreciate the impact altered mental status has on a patient's quality of life, well-being, ability to work, and the family. *(P)*
7. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the diagnosis and treatment of altered mental status. *(P, SBP)*

**D. REFERENCES:**

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## TRAINING PROBLEM #4: ANEMIA

### **RATIONALE:**

Anemia is a common finding, often identified incidentally in asymptomatic patients. It can be a manifestation of a serious underlying disease. Distinguishing among the many disorders that cause anemia, not all of which require treatment, is an important training problem for third year medical students.

### **PREREQUISITES:**

- Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:
- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of pathogenesis and pathophysiology of anemia.
- Knowledge of the basic biochemistry and pathophysiology of the blood and bone marrow.
- Knowledge of the pharmacology of medications that can cause anemia as well as those used to treat it.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Classification of anemia based on red cell size:
  - Microcytic:
    - Iron deficiency. *(MK)*
    - Thalassemic disorders. *(MK)*
    - Sideroblastic anemia. *(MK)*
  - Normocytic:
    - Acute blood loss. *(MK)*
    - Hemolysis. *(MK)*
    - Anemia of chronic disease (e.g. infection, inflammation, malignancy). *(MK)*
    - Chronic renal insufficiency/erythropoietin deficiency. *(MK)*
    - Bone marrow suppression (e.g. bone marrow invasion, aplastic anemia).
    - Hypothyroidism. *(MK)*
    - Testosterone deficiency. *(MK)*
    - Early presentation of microcytic or macrocytic anemia (e.g. early iron deficiency anemia). *(MK)*
    - Combined presentation of microcytic and macrocytic anemias. *(MK)*
  - Macrocytic:
    - Ethanol abuse. *(MK)*
    - B12 deficiency. *(MK)*
    - Folate deficiency. *(MK)*
    - Drug-induced. *(MK)*
    - Reticulocytosis. *(MK)*
    - Liver disease. *(MK)*
    - Myelodysplastic syndromes. *(MK)*
    - Hypothyroidism. *(MK)*
10. Morphological characteristics, pathophysiology, and relative prevalence of each of the causes of anemia. *(MK)*



11. The meaning and utility of various components of the hemogram (e.g. hemoglobin, hematocrit, mean corpuscular volume, and random distribution width). *(MK)*
12. The classification of anemia into hypoproliferative and hyperproliferative categories and the utility of the reticulocyte count/index. *(MK)*
13. The potential usefulness of the white blood cell count and red blood cell count when attempting to determine the cause of anemia. *(MK)*
14. The diagnostic utility of the various tests for iron deficiency (e.g. serum iron, total iron binding capacity, transferrin saturation, ferritin). *(MK)*
15. The genetic basis of some forms of anemia. *(MK)*
16. Indications, contraindications, and complications of blood transfusion. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - Constitutional and systemic symptoms (e.g. fatigue, weight loss). *(PC, CS)*
  - History of gastrointestinal bleeding or risk factors for it. *(PC, CS)*
  - Abdominal pain. *(PC, CS)*
  - Prior history of anemia or other blood diseases. *(PC, CS)*
  - Medications. *(PC, CS)*
  - Diet. *(PC, CS)*
  - Alcohol use. *(PC, CS)*
  - Menstrual history. *(PC, CS)*
  - Family history of anemia or other blood diseases. *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Pallor (e.g. palms, conjunctiva, nail beds). *(PC)*
  - Mouth (e.g. glossitis, cheilosis). *(PC)*
  - Hyperdynamic precordium, systolic flow murmur. *(PC)*
  - Lymph nodes. *(PC)*
  - spleen. *(PC)*
  - Obtain stool for occult blood testing. *(PC)*
  - Nervous system. *(PC)*
3. **Differential diagnosis:** Students should be able to generate a list of the most important and most common causes of anemia, recognizing specific history, physical exam, and laboratory findings that suggest a specific etiology. *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
  - Hemoglobin and hematocrit. *(PC, MK)*
  - Red cell indices (e.g. mean corpuscular volume and random distribution width). *(PC, MK)*
  - White blood cell and platelet count. *(PC, MK)*
  - Reticulocyte count. *(PC, MK)*
  - Iron studies (serum iron, TIBC, ferritin, transferrin). *(PC, MK)*
  - Serum B12 and folate. *(PC, MK)*
  - Haptoglobin. *(PC, MK)*

- Lactic dehydrogenase. (LDH) (PC, MK)
- Hemoglobin electrophoresis. (PC, MK)
- Blood smear. (PC, MK)

Students should be able to define the indications for and interpret (**with consultation**) results

of:

- Bone marrow biopsy. (PC, MK)

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. (PC, CS)
- Elicit questions from the patient about the management plan. (PC, CS)
- Counsel with regard to (a) possible causes, (b) appropriate further evaluation to establish the diagnosis of an underlying disease, and (c) the impact on the family (genetic counseling). (PC, CS)

6. **Basic procedural skills:** Students should be able to perform and interpret:

- Stool occult blood testing. (PC)

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Evaluating for underlying disease processes, given that anemia is not a disease per se, but rather a common finding that requires further delineation in order to identify the underlying cause. (PC, MK)
- Prescribing indicated replacement therapy, including iron, vitamin B12, and folic acid. (PC, MK)
- Determining when to obtain consultation from a hematologist. (PC, SBP)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to anemia. (PC, PLI)
- Incorporating patient preferences. (PC, P)

C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1 Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for anemia. (PLI, P)

2 Respond appropriately to patients who are non-adherent to treatment for anemia. (CS, P)

3 Demonstrate ongoing commitment to self-directed learning regarding anemia. (PLI, P)

Appreciate the impact anemia has on a patient's quality of life, well-being, ability to work, and the family. (P)

4 Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professions in the treatment of anemia. (P, SBP)

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## TRAINING PROBLEM #5: BACK PAIN

### **RATIONALE:**

Back pain is one of the most commonly encountered problems in the outpatient, primary care internal medicine setting. It has an important differential diagnosis, and the initial decision-making must be made on the basis of clinical findings. As such, it is an excellent training condition for teaching decision-making based on careful collection and interpretation of basic clinical data. There is emerging data on test utility, especially as regards expensive spinal imaging, which facilitates teaching rational, cost-effective test ordering. Moreover, its requirement for skillful management, patient education, and support facilitate the teaching of these competencies.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy and physiology of bony, soft tissue, vascular, and of the spine.
- Pathogenesis and pathophysiology of muscular strain, osteoarthritis, spinal stenosis, osteoporosis, disc degeneration, and spinal metastases.
- Pharmacology of non-narcotic and narcotic analgesics, nonsteroidal anti-inflammatory drugs, muscle “relaxants.”

### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The symptoms, signs, and typical clinical course of the various causes of back pain including:
  - Ligamentous/muscle strain (nonspecific musculoskeletal back pain). *(MK)*
    - Degenerative arthritis (spondylosis). *(MK)*
    - Disc herniation. *(MK)*
    - Spinal stenosis. *(MK)*
    - Vertebral compression fracture. *(MK)*
    - Traumatic fracture. *(MK)*
    - Sacroileitis. *(MK)*
    - Spinal metastases. *(MK)*
    - Spinal epidural abscess. *(MK)*
    - Cauda equina syndrome. *(MK)*
2. The role of diagnostic studies in the evaluation of the back pain their indications, limitations, cost:
  - Plain radiography. *(MK)*
  - CT. *(MK)*
  - MRI. *(MK)*
  - Myelogram. *(MK)*
  - Electrodiagnosis (i.e. electromyography and nerve conduction studies). *(MK)*
  - Bone densitometry. *(MK)*
3. Response to therapy of the various etiologies, with understanding of the roles of:

- Bed rest. (MK)
  - Exercise. (MK)
  - Analgesia. (MK)
  - NSAIDs. (MK)
  - Heat/ice. (MK)
  - Ultrasound. (MK)
  - Spinal manipulation. (MK)
  - Surgical interventions. (MK)
4. Risk factor for and means of limiting disability and chronicity. (MK)
  5. Fear avoidance behaviors. (MK)
  6. Pain related behaviors with regard to chronic narcotic use. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - Cancer history. (PC, CS)
  - Weight loss. (PC, CS)
  - Fever. (PC, CS)
  - Recent infection. (PC, CS)
  - Intravenous drug use. (PC, CS)
  - Steroid use. (PC, CS)
  - Trauma. (PC, CS)
  - Rapidly progressive focal numbness and/or weakness. (PC, CS)
  - Bowel/bladder dysfunction. (PC, CS)
  - Saddle anesthesia. (PC, CS)
  - Symptoms of systemic rheumatologic conditions. (PC, CS)
  - Anatomic abnormalities (e.g. kyphosis, scoliosis). (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Examination of the spine. (PC)
  - Neurologic examination of the lower extremities. (PC)
  - Straight leg raising test. (PC)
  - Testing for saddle anesthesia. (PC)
  - Assessment of rectal tone. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology for back pain (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.  
Laboratory and diagnostic tests should include, when appropriate:
  - ESR. (PC, MK)
  - CBC. (PC, MK)
  - Serum Alk Phos. (PC, MK)
 Students should be able to define the indications for and interpret (**with consultation**) the

results of:

- Plain spinal radiography. (PC, MK)
- Spinal CT. (PC, MK)
- Spinal MRI. (PC, MK)
- Radionuclide bone scan. (PC, MK)
- Bone densitometry. (PC, MK)
- Electrodiagnostic tests. (PC, MK)

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. (PC, CS)
- Explain the importance of active participation in the treatment plan. (PC, CS)
- Elicit questions from the patient and their family about the management plan. (PC, CS)

6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Patient education about the typical course of back pain. (PC, MK)
- Methods to prevent the development of chronic back pain. (PC, MK)
- Proper use of analgesics, NSAIDs, muscle relaxants, and local heat/ice. (PC, MK)
- Teaching back hygiene measures, exercises, and proper lifting and standing ergonomics. (PC, MK)
- Counseling patients about lifestyle modifications including weight loss. (PC, MK)
- The potential role of chiropractic, acupuncture, and massage (PC, MK)
- Determining when to obtain consultation from an appropriate back pain specialist. (PC, SBP)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to back pain. (PC, PLI)
- Incorporating patient preferences. (PC, P)

C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

- 1 Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for back pain. (PLI, P)
- 2 Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for back pain. (P)
- 3 Appreciate the importance of active patient involvement in the treatment of back pain. (P)
- 4 respond appropriately to patients who are nonadherent to treatment for back pain. (CS, P)
- 5 respond appropriately to patients with chronic back pain (P)
- 6 Demonstrate ongoing commitment to self-directed learning regarding back pain. (PLI, P)
- 7 Appreciate the impact back pain has on a patient's quality of life, well-being, ability to work, and the family. (P)
- 8 Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the treatment of back pain. (P, SBP)

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## TRAINING PROBLEM #6: CHEST PAIN

### **RATIONALE:**

Chest pain is a common and important presenting symptom for a variety of disorders, some of which may be life-threatening emergencies. The ability to distinguish chest pain caused by an acute coronary syndrome (unstable angina or acute myocardial infarction) from other cardiac, gastrointestinal, pulmonary, musculoskeletal or psychogenic etiologies is an important training problem for third-year medical students.

### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate appropriately with patients of diverse backgrounds, including the elderly patient.
- Knowledge of the anatomy of the heart, chest and abdomen.
- Understanding of the epidemiology of heart disease.
- Knowledge of the pathogenesis and pathophysiology of cardiovascular disease.
- Knowledge of the pharmacology of cardiovascular drugs.
- Ability to perform a cardiovascular risk assessment and understand issues related to primary and secondary prevention of cardiovascular disease.
- Ability to understand the impact of illness on individuals and their families.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe and discuss:

- 1 Symptoms and signs of chest pain that may be due to an acute coronary syndrome such as unstable angina or acute myocardial infarction. *(MK)*
- 2 Symptoms and signs of chest pain that are characteristic of angina pectoris. *(MK)*
- 3 Symptoms and signs of chest pain due to other cardiac causes such as:
  - Atypical or variant angina (coronary vasospasm, Prinzmetal angina). *(MK)*
  - Cocaine-induced chest pain. *(MK)*
  - Pericarditis. *(MK)*
  - Aortic dissection. *(MK)*
  - Valvular heart disease (aortic stenosis, mitral valve prolapse). *(MK)*
  - Non-ischemic cardiomyopathy. *(MK)*
  - Syndrome X. *(MK)*
4. Symptoms and signs of chest pain due to gastrointestinal disorders such as:
  - Esophageal disease (GERD, esophagitis, esophageal dysmotility). *(MK)*
  - Biliary disease (cholecystitis, cholangitis). *(MK)*
  - Peptic ulcer disease. *(MK)*
  - Pancreatitis. *(MK)*
5. Symptoms and signs of chest pain due to pulmonary disorders such as:
  - Pneumonia. *(MK)*
  - Spontaneous pneumothorax. *(MK)*
  - Pleurisy. *(MK)*
  - Pulmonary embolism. *(MK)*

- Pulmonary hypertension/cor pulmonale. (MK)
6. Symptoms and signs of chest pain due to musculoskeletal causes such as:
    - Costochondritis. (MK)
    - Rib fracture. (MK)
    - Myofascial pain syndromes. (MK)
    - Muscular strain. (MK)
    - Herpes zoster. (MK)
  7. Symptoms and signs of chest pain due to psychogenic causes such as:
    - Panic disorders. (MK)
    - Hyperventilation. (MK)
    - Somatoform disorders. (MK)
  8. Factors that may be responsible for provoking or exacerbating symptoms of ischemic chest pain by:
    - Increasing myocardial oxygen demand.
      - Tachycardia or tachyarrhythmia. (MK)
      - Hypertension. (MK)
      - Increased wall stress (aortic stenosis, cardiomyopathy). (MK)
      - Hyperthyroidism. (MK)
    - Decreasing myocardial oxygen supply.
      - Anemia. (MK)
      - Hypoxemia. (MK)
  9. Risk factors for the development of coronary heart disease:
    - Age and gender. (MK)
    - Family history of sudden death or premature CAD. (MK)
    - Personal history of peripheral vascular or cerebrovascular disease. (MK)
    - Smoking. (MK)
    - Lipid abnormalities (includes dietary history of saturated fat and cholesterol). (MK)
    - Diabetes mellitus. (MK)
    - Hypertension. (MK)
    - Obesity. (MK)
    - Sedentary lifestyle. (MK)
    - Cocaine use. (MK)
    - Estrogen use. (MK)
    - Chronic inflammation. (MK)
  10. Physiologic basis and/or scientific evidence supporting each type of treatment, intervention or procedure commonly used in the management of patients who present with chest pain. (MK)
  11. Role of a critical pathway or practice guideline in delivering high quality, cost-effective care for patients presenting with symptoms of chest pain in the outpatient clinic, emergency room or hospital. (MK, PC, SBP)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an appropriately complete medical history that differentiates among the common etiologies of chest pain.
  - The initial medical history should allow students to categorize the patients' symptoms as angina pectoris, atypical angina or non-cardiac chest pain. (PC, CS)
  - Specifically, the medical history of a patient with chest pain should contain information



about those clinical characteristics that are typical of angina pectoris:

- Substernal location. (PC, CS)
- Precipitated by exertion. (PC, CS)
- Relieved by rest or nitroglycerin. (PC, CS)
- Onset, duration, severity, radiation, presence or absence of associated symptoms (such as dyspnea, diaphoresis or lightheadedness). (PC, CS)
- The history of a patient with chest pain should also contain information about:
  - Risk factors for coronary heart disease. (PC, CS)
  - Previous history of ischemic heart disease or valvular heart disease (rheumatic fever, cardiac murmurs). (PC, CS)
  - Previous history of peripheral vascular disease or cerebrovascular disease. (PC, CS)
- Students should be able to use the medical history to assess the functional status of patients who present with ischemic chest pain. (PC, CS)

2. **Physical exam skills:** Students should be able to perform a focused physical exam that includes the following elements:

- Accurate measurement of arterial blood pressure and recognition of the typical blood pressure findings that occur in patients with aortic stenosis, aortic insufficiency, and pulsus paradoxus. (PC)
- Assessment of major arterial pulses for abnormalities, including bruits. (PC)
- Assessment of the neck veins for jugular venous distention and, when necessary, evaluation for abdominal jugular reflux. (PC)
- Assessment of the conjunctiva and optic fundus. (PC)
- Assessment of the extremities to ascertain skin condition, including color, temperature and the presence of edema, xanthomas, cyanosis and clubbing. (PC)
- Assessment of the lungs for crackles, rhonchi, rales and decreased breath sounds. (PC)
- Inspection and palpation of the anterior chest to identify right and left sided heaves, lifts, and thrills. (PC)
- Auscultation of the heart to determine rhythm, intensity of heart sounds, splitting of S2 and the presence of rales, gallops (S3, S4, summation) or extra heart sounds (e.g. clicks). (PC)
- Auscultation of the heart to detect the presence of heart murmurs. When a heart murmur is present, students should be able to:
  - Identify timing (systolic vs. diastolic, holosystolic vs. ejection). (PC)
  - Describe pitch, location and pattern of radiation. (PC)
  - Gauge significance (innocent vs. pathologic, sclerosis vs. stenosis). (PC)
- Assessment of the abdomen to determine the presence of epigastric or right upper quadrant tenderness, hepatomegaly, abnormal pulsations or bruits. (PC)

3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis and recognize specific history, physical exam, and laboratory findings that suggest a diagnosis of myocardial ischemia rather than a non-ischemic cause of chest pain (GI, pulmonary, musculoskeletal, psychogenic or undetermined). (PC, MK)

4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Test interpretation should take into account:

- Important differential diagnostic considerations including the “must not miss” diagnoses. (PC, MK)
- Pre-test and post-test likelihood of disease (probabilistic reasoning). (PC, MK)
- Performance characteristics of individual tests (sensitivity, specificity, positive and negative predictive value, likelihood ratios). (PC, MK)

Laboratory and diagnostic tests should include, when appropriate:

- Cardiac biomarkers indicative of myocardial necrosis. (PC, MK)
- 12-lead ECG. (PC, MK)
- Chest radiograph. (PC, MK)
- ABG. (PC, MK)

Students should be able to define the indications for, and interpret (**with consultation**) the results of the following diagnostic tests and procedures:

- Echocardiogram (transthoracic and transesophageal). (PC, MK)
- Exercise stress test. (PC, MK)
- Stress thallium (myocardial perfusion scan). (PC, MK)
- Dobutamine stress echocardiography. (PC, MK)
- Coronary angiography. (PC, MK)
- Electron beam CT scan (for coronary calcification). (PC, MK)
- Ventilation/perfusion lung (V/Q) scan. (PC, MK)
- Pulmonary embolism protocol CT scan. (PC, MK)
- Pulmonary angiography. (PC, MK)

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, prognosis and treatment plan to patients and their families. (PC, CS)
- As appropriate for age and gender, educate patients about risk factors for cardiovascular disease. (PC, CS)
- Counsel patients or facilitate the provision of counseling related to:
  - Smoking cessation. (PC, CS)
  - Reduction of dietary saturated fats and cholesterol. (PC, CS)
  - Restriction of dietary sodium intake. (PC, CS)
  - Weight reduction. (PC, CS)
  - Increased physical activity. (PC, CS)

6. **Basic procedural skills:** Students should be able to:

- Perform a 12-lead ECG. (PC)

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Identification of the indications, contraindications, mechanisms of action, adverse reactions, significant interactions, and relative costs of the following medications:
  - Anti-platelet agents (aspirin, clopidogrel). (PC, MK)
  - Nitroglycerin and long-acting nitrates. (PC, MK)
  - Beta-blockers. (PC, MK)
  - Angiotensin-converting enzyme inhibitors. (PC, MK)
  - Calcium channel blockers. (PC, MK)
  - Antithrombotic therapy (heparin, warfarin). (PC, MK)
  - Glycoprotein IIb/IIIa inhibitors. (PC, MK)
  - Lipid-lowering agents. (PC, MK)
- Identification of the indications, contraindications, complications, long-term outcomes and relative costs associated with the following treatment modalities for ischemic heart disease:
  - Thrombolytic therapy. (PC, MK)
  - Percutaneous coronary intervention (with or without stenting). (PC, MK)
  - Coronary artery bypass graft surgery (CABG). (PC, MK)
- Determining when to consult a cardiologist or other subspecialist in the management of patients with chest pain. (PC, SBP)
- Description of how the diagnosis and treatment of chest pain in special populations may

differ (e.g. very elderly, associated co-morbidities). (PC, MK)

- Accessing and utilizing appropriate information systems and resources to help delineate issues related to chest pain. (PC, PLI)
- Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Understand the emotional impact of a diagnosis of coronary artery disease and its potential effect on lifestyle (work performance, sexual functioning, etc). (PC, P)
2. Respond appropriately to patient who are nonadherent to lifestyle modifications. (CS, P)
3. Recognize the importance of early detection and modification of risk factors that may contribute to the development of atherosclerosis. (PC, P)
4. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for chest pain. (PLI, P)
5. Demonstrate ongoing commitment to self-directed learning regarding chest pain. (PLI, P)
6. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of chest pain. (P, SBP)

**D. REFERENCES:**

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## TRAINING PROBLEM #7: COUGH

### **RATIONALE:**

Cough is one of the most common symptoms with which a patient will present in the outpatient setting. There are several common etiologies for cough of which a third year medical student should be aware, as well as more clinically concerning etiologies. A proper understanding of the pathophysiology, diagnosis, and treatment of cough is an important learning objective.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of respiratory anatomy, physiology and pathophysiology.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe and discuss:

- The criteria used to classify a cough (e.g. acute vs. chronic, productive vs. non-productive). *(MK)*
- Symptoms, signs, pathophysiology, differential diagnosis, and typical clinical course of the most common causes cough:
  - Acute cough:
    - Viral tracheitis. *(MK)*
    - Acute bronchitis. *(MK)*
    - Pneumonia. *(MK)*
  - Chronic cough:
    - Gastroesophageal reflux. *(MK)*
    - Post-nasal drip. *(MK)*
    - Asthma/reactive airways disease. *(MK)*
    - Angiotensin converting enzyme inhibitors. *(MK)*
    - Post-infectious. *(MK)*
    - Infectious (pertussis, tuberculosis). *(MK)*
    - Chronic bronchitis. *(MK)*
    - Bronchiectasis. *(MK)*
    - Pleural effusion. *(MK)*
    - Lung cancer. *(MK)*
    - Congestive heart failure. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among the etiologies of disease, including:
  - Onset. *(PC, CS)*
  - Duration. *(PC, CS)*
  - Exacerbating/relieving factors. *(PC, CS)*
  - Associated symptoms (fever, chills, weight loss). *(PC, CS)*
  - Presence or absence of hemoptysis. *(PC, CS)*

- Tobacco history. (PC, CS)
  - Relevant past medical history. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
    - Accurately determining respiratory rate and level of respiratory distress. (PC)
    - Recognizing the pharyngeal signs of post nasal drip. (PC)
    - Identifying rales, rhonchi, and wheezes. (PC)
    - Recognizing signs of pulmonary consolidation. (PC)
  3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing history, physical exam, and laboratory findings that suggest a specific etiology of cough. (PC, MK)
  4. **Laboratory interpretations:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
    - Chest radiograph. (PC, MK)
    - Pleural fluid cell count and chemistries. (PC, MK)
    - PFTs. (PC, MK)
    - Sputum Gram stain and sputum acid-fast stain. (PC, MK)
    - Sputum culture and sensitivities. (PC, MK)
 Students should be able to define the indications for and interpret (**with consultation**) results of:
    - Barium swallow. (PC, MK)
    - Upper endoscopy. (PC, MK)
    - Sputum cytology. (PC, MK)
    - Chest CT scan. (PC, MK)
  5. **Communication skills:** Students should be able to:
    - Counsel and educate patients about environmental contributors to their disease, pneumococcal and influenza immunizations, and smoking cessation. (PC, CS)
    - Communicate the diagnosis, prognosis, and treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
    - Elicit input and questions from the patient and his or her family about the management plan. (PC, CS)
  6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
    - Describing the indications, contraindications, mechanisms of action, adverse reactions, significant interactions, and relative costs of the various treatments, interventions, or procedures commonly used to diagnose and treat patients who present with symptoms of cough. (PC, MK, SBP)
    - Determining when to obtain consultation from a pulmonologist, allergist, otolaryngologist, or gastroenterologist. (PC, SBP)
    - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
    - Accessing and utilizing appropriate information systems and resources to help delineate issues related to patients with chronic cough. (PC, PLI)
    - Incorporating patient needs and preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for cough. (*PLI, P*)
2. Respond appropriately to patients who are non-adherent to treatment for cough and smoking cessation. (*CS, P*)
3. Demonstrate ongoing commitment to self-directed learning regarding diagnosis and management of cough. (*PLI, P*)
4. Appreciate the impact that an acute or chronic cough has on a patient's quality of life, well-being, ability to work, and the family. (*P*)
5. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of cough. (*P, SBP*)

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## TRAINING PROBLEM #8: DYSPNEA

### **RATIONALE:**

Shortness of breath or dyspnea is one of the most common patient complaints encountered in internal medicine. It has a very large number of etiologic possibilities— some benign but many potentially life-threatening. Because of the latter, a systematic approach to dyspnea is crucial.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy, physiology, and pathophysiology of the pulmonary, cardiac, neurologic, and musculoskeletal systems.
- Physiology of acid-base homeostasis.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Major organ systems/pathologic states causing dyspnea and their pathophysiology, including:
  - Cardiac. (MK)
  - Pulmonary. (MK)
  - Anemia/hypovolemia. (MK)
  - Acid-base disorders and other metabolic derangements (MK)
  - Neuromuscular weakness. (MK)
  - Central neurologic derangements. (MK)
2. The symptoms, signs, and laboratory values associated with respiratory failure and ventilatory failure. (MK)
3. The alveolar-arterial oxygen gradient and the pathophysiologic states that can alter it. (MK)
4. The potential risks of relying too heavily on pulse oximetry as the sole indicator of arterial oxygen content. (MK)
5. The common causes of acute dyspnea, their pathophysiology, symptoms, and signs, including:
  - Pulmonary edema. (MK)
  - Pulmonary embolism. (MK)
  - Pneumonia. (MK)
  - Acute exacerbation of COPD. (MK)
  - Asthma. (MK)
  - Cardiac ischemia. (MK)
  - Pneumothorax. (MK)
  - Anxiety. (MK)
6. The common causes of chronic dyspnea their pathophysiology, symptoms, and signs, including:
  - Congestive heart failure. (MK)
  - COPD. (MK)
  - Pulmonary parenchymal disease. (MK)
  - Pulmonary vascular disease. (MK)

- Anemia. (MK)
  - Neuromuscular weakness. (MK)
7. Basic treatment options for the common causes of acute and chronic dyspnea. (MK)
  8. The utility of supplemental oxygen therapy and the potential dangers of overly aggressive oxygen supplementation in some pathophysiologic states. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - Quantity, quality, severity, duration, ameliorating/exacerbating factors of the dyspnea. (PC, CS)
  - Associated symptoms such as fevers, chills, sweats, orthopnea, paroxysmal nocturnal dyspnea, wheezing, edema, chest pain, cough, sputum production, hemoptysis, palpitations, nausea, anxiety, dizziness, orthostasis, weakness. (PC, CS)
  - History of pulmonary, cardiac, neuromuscular/neurologic, renal, hepatic, and coagulopathic disorders. (PC, CS)
  - Risk factors for deep vein thrombosis/pulmonary embolism. (PC, CS)
  - Ingestion of drugs and toxic substances, administration of IV fluids. (PC, CS)
  - Smoking and environmental exposures. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Accurately determining respiratory rate and level of respiratory distress. (PC)
  - Assessing the use of accessory muscles for breathing. (PC)
  - Accurately measuring pulsus paradox. (PC)
  - Identifying bronchial breath sounds, rales, rhonchi, wheezes, and subcutaneous emphysema. (PC)
  - Identifying signs of pulmonary consolidation and hyperresonance. (PC)
  - Identifying signs of pleural effusion. (PC)
  - Identifying signs of elevated central venous pressure. (PC)
  - Identifying signs of hypovolemia. (PC)
  - Identifying S3 gallop, edema, and pallor. (PC)
  - Identifying signs of deep vein thrombosis. (PC)
- **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology of dyspnea (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
  - CBC. (PC, MK)
  - Electrolytes, BUN/Cr, GLC. (PC, MK)
  - Pulse oximetry. (PC, MK)
  - ABG. (PC, MK)
  - Chest radiograph. (PC, MK)
  - 12-lead ECG. (PC, MK)



- Pulmonary function tests. *(PC, MK)*

Students should be able to define the indications for and interpret (**with consultation**) the results of:

- Ventilation perfusion scintigraphy. *(PC, MK)*
- Chest CT. *(PC, MK)*
- Venous Doppler studies. *(PC, MK)*
- Cardiac stress test. *(PC, MK)*
- Echocardiography. *(PC, MK)*

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. *(PC, CS)*
- Elicit questions from the patient and his or her family about the management plan. *(PC, CS)*
- Counsel and educate patients about environmental contributors to their disease. *(PC, CS)*
- Counsel patients nonjudgmentally about smoking cessation. *(PC, CS)*

6. **Basic and advanced procedural skills:** Students should be able to:

- Obtain an ABG. *(PC)*

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- A rapid triage approach to the acutely dyspneic patient. *(PC, MK)*
- An appropriate assessment of the patient's oxygenation status. *(PC, MK)*
- Appropriate oxygen supplementation as indicated. *(PC, MK)*
- Management plans for pulmonary edema/congestive heart failure, pneumonia, COPD, asthma, pulmonary embolism, cardiac ischemia, hypovolemia, anemia, and pneumothorax. *(PC, MK)*
- Determining when to obtain consultation from an appropriate specialist. *(PC, SBP)*
- Using a cost-effective approach based on the differential diagnosis. *(PC, SBP)*
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to dyspnea. *(PC, PLI)*
- Incorporating patient preferences. *(PC, P)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for dyspnea. *(PLI, P)*
2. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for dyspnea. *(P)*
3. Demonstrate ongoing commitment to self-directed learning regarding dyspnea. *(PLI, P)*
4. Appreciate the impact dyspnea has/have on a patient's quality of life, wellbeing, ability to work, and the family. *(P)*
5. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the diagnosis and treatment of dyspnea. *(P, SBP)*
6. Show understanding for the difficulties patients face with smoking cessation. *(P)*

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## TRAINING PROBLEM #9: DYSURIA

### **RATIONALE:**

Dysuria is a very common presentation in the outpatient setting. Given the amount of health care dollars that are spent on antibiotic treatment of urinary tract infections as well as the emergence of resistance, it is important for third year medical students to have a working knowledge of how to approach the patient with this complaint, and how to differentiate patients with cystitis from other common causes of dysuria.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of genitourinary anatomy, physiology and pathophysiology.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Presenting signs and symptoms of the common causes of dysuria, including:
  - Cystitis. *(MK)*
  - Urethritis, gonococcal and non-gonococcal (e.g. chlamydia, trichomonas, HSV). *(MK)*
  - Pyelonephritis. *(MK)*
  - Acute and chronic prostatitis. *(MK)*
  - Epididymitis. *(MK)*
  - Vaginitis (yeast, bacterial vaginosis, trichomonas, atrophic, irritant). *(MK)*
  - Interstitial cystitis. *(MK)*
2. Symptoms and signs of pyelonephritis and how to distinguish an upper from a lower UTI. *(MK)*
3. Common bacteria that cause UTI. *(MK)*
4. Aspects of pathogenesis that affect UTI, including gender, sexual activity, diabetes, anatomic anomalies, instrumentation, and use of an indwelling catheter. *(MK)*
5. Indications for pursuing further work up for patients with UTI. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate history that differentiates among etiologies of dysuria, including:
  - Timing, frequency, severity, and location of dysuria. *(PC, CS)*
  - Fever, chills, sweats. *(PC, CS)*
  - Frequency, urgency, hesitancy, incomplete voiding. *(PC, CS)*
  - Back, abdominal, and groin pain. *(PC, CS)*
  - History of nephrolithiasis. *(PC, CS)*
  - Hematuria. *(PC, CS)*
  - Vaginal or penile discharge. *(PC, CS)*
  - Penile skin lesions. *(PC, CS)*
  - Sexual activity. *(PC, CS)*
  - History of sexual transmitted diseases. *(PC, CS)*

- Dyspareunia. (PC, CS)
  - Scrotal, testicular, and perineal pain. (PC, CS)
  - Use of topical hygiene products. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
- Percussion and palpation of the bladder to accurately recognize distention and tenderness. (PC)
  - Palpation over the kidneys to elicit flank tenderness. (PC)
  - Palpation of the abdomen to elicit tenderness. (PC)
  - Palpation and massage of the male prostate to obtain discharge. (PC)
  - Accurate recognition of perineal or vaginal atrophy and inflammation. (PC)
  - Techniques of the pelvic examination to assess for causes of vaginitis. (PC)
3. **Differential diagnosis:** Students should be able to generate a differential diagnosis recognizing specific history, physical exam, and laboratory findings that suggest a specific etiology of dysuria. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.
- Laboratory and diagnostic tests should include, when appropriate:
- Urinalysis interpretation including cells and casts, urine dipstick and Gram stain when appropriate. (PC, MK)
  - Urine culture. (PC, MK)
  - Gram stain and culture of urethral or cervical discharge. (PC, MK)
  - KOH stain and normal saline wet prep of vaginal discharge. (PC, MK)
  - Urinary or cervical PCR to test for gonorrhea and Chlamydia. (PC, MK)
  - KUB radiograph. (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
  - Elicit input and questions from the patient and his or her family about the management plan. (PC, CS)
  - Counsel patients about safe sexual activity. (PC, CS)
  - Explain the risk of recurrent UTI and counsel regarding preventative measures. (PC, CS)
6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Selecting appropriate empiric antibiotic therapy for cystitis, pyelonephritis or urethritis prior to culture results. (PC, MK)
  - Counseling patients on symptomatic therapies for acute cystitis. (PC, MK)
  - Selecting the appropriate duration of therapy for cystitis and pyelonephritis. (PC, MK)
  - Evaluating and managing patients with recurrent urinary tract infections including prophylaxis. (PC, MK)
  - Choosing appropriate treatment for vaginitis depending on results of evaluation. (PC, MK)
  - Understanding the treatment of prostatitis based on probable organisms and age. (PC, MK)
  - Determining when to obtain consultation from a urologist or gynecologist. (PC, MK)
  - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to dysuria. (PC, PLI)

- Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for dysuria. (PLI, P)
2. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for dysuria. (P)
3. Demonstrate ongoing commitment to self-directed learning regarding dysuria. (PLI, P)
4. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the treatment of dysuria. (P, SBP)

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## TRAINING PROBLEM #10: FEVER

### **RATIONALE:**

Because fever can have many infectious or noninfectious causes, patients with fever should be stratified by host susceptibility factors and evaluated in a systematic manner. A rational approach to patients with fever will help clinicians recognize presentations that need immediate attention, limit unnecessary diagnostic testing in less seriously ill patients, and help inform therapeutic decision making.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Physiology and pathophysiology of thermoregulation and the immune response.
- Pharmacology of antipyretics.

### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Physiology of the acute febrile response, including the:
  - Beneficial and detrimental effects of fever upon the host. *(MK)*
  - The differences in clinical manifestations between immunocompetent and immunocompromised patients. *(MK)*
2. Risk factors and co-morbidities that are important in determining the host response to infection (e.g. neutropenia, asplenia, cirrhosis, alcoholism, diabetes, corticosteroid use, malnutrition, T cell dysfunction) *(MK)*
3. Etiology of fever in special populations, including patients with a history of:
  - Neutropenia due to cancer-related myelosuppression. *(MK)*
  - HIV disease. *(MK)*
  - Intravenous drug abuse. *(MK)*
  - Recent international travel or immigration. *(MK)*
  - Concomitant skin rash and lymphadenopathy. *(MK)*
4. Pathophysiology and clinical presentation of patients with sepsis syndromes. *(MK)*
5. Common causes of prolonged fever without apparent source, including:
  - FUO in a normal host. *(MK)*
  - Nosocomial FUO. *(MK)*
  - Neutropenic FUO. *(MK)*
  - FUO associated with HIV disease. *(MK)*

B. **SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
  - Chronology, duration and pattern of fever. *(PC, CS)*
  - Associated symptoms. *(PC, CS)*
  - Immune status and baseline co-morbidities. *(PC, CS)*
  - Immunization status. *(PC, CS)*

- Relevant history of exposures. (PC, CS)
  - Occupational, travel, family, and sexual history. (PC, CS)
  - Medication history, including use of over-the-counter and illicit drugs. (PC, CS)
3. **Physical exam skills:** Students should be able to perform a complete physical exam to determine the severity of disease and establish a preliminary hypothesis about the cause of fever. (PC)
4. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology:
- Infection. (PC, MK)
  - Rheumatologic disease/inflammatory disorder. (PC, MK)
  - Malignancy. (PC, MK)
  - Drug reaction. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
- CBC with differential. (PC, MK)
  - UA with exam of urinary sediment. (PC, MK)
  - Chest radiography. (PC, MK)
  - Blood cultures. (PC, MK)
  - Urine cultures. (PC, MK)
  - Sputum Gram stain and cultures. (PC, MK)
  - Sputum AFB stain and culture. (PC, MK)
  - ESR and/or specific rheumatologic tests. (PC, MK)
  - PPD. (PC, MK)
  - Cerebrospinal fluid analysis (color, opening pressure, chemistries, cell counts, staining, cultures, cytology, cryptococcal antigen, VDRL). (PC, MK)
  - Chemistries, Gram stain, and culture of abnormal fluid collections (e.g. pleural effusion, ascites, abscesses). (PC, MK)
  - Stool culture of enteric pathogens. (PC, MK)
  - Stool *Clostridium difficile* toxin assay. (PC, MK)
  - Stains and cultures from the throat, urethra, anus, cervix, vagina. (PC, MK)
  - HIV ELISA and western blot. (PC, MK)
- Students should be able to define the indications for and interpret (**with consultation**) the results of:
- CT imaging. (PC, MK)
  - Echocardiography. (PC, MK)
  - Tissue biopsy. (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up patients. (PC, CS)
  - Elicit questions from the patient and their family about the management plan. (PC, CS)
6. **Basic and advanced procedural skills:** Students should be able to:
- Obtain blood, wound, and throat cultures. (PC)
  - Place and interpret a PPD. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Developing an appropriate evaluation plan for patients with fever including ordering and interpreting appropriate laboratory and radiographic studies. (PC)
- Assessing the severity of presentation based on the history, host factors, physical exam and laboratory results and recognizing presentations that need immediate attention. (PC)
- Developing an appropriate treatment plan for patients with fever including the selection of an initial, empiric treatment regimen for neutropenic patients with fever and/or patients with life threatening sepsis. (PC)
- Determining when to obtain consultation from an appropriate specialist. (PC, SBP)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to fever. (PC, PLI)
- Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

3. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for fever. (P, PLI)
4. Appreciate the impact fever has on a patient's quality of life, well-being, ability to work, and family; recognize the emotional impact of differential diagnosis. (P)
5. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professions in the diagnosis and treatment of fever. (P, SBP)

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## TRAINING PROBLEM #11: FLUID, ELECTROLYTE AND ACID-BASE DISORDERS

### **RATIONALE:**

Many disease processes can cause serious disturbances in the fluid, electrolyte and acid-base status of patients. Clinicians must be prepared to identify and correct these disturbances as efficiently as possible, thus making it an important training problem for third year medical students.

### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of pathogenesis and pathophysiology of fluid, electrolyte and acid-base disorders.
- Knowledge of medications that can cause alterations in fluid and electrolyte status as well as disturbance of acid-base status.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe and discuss:

1. The pathophysiology of:
  - Hypo- and hypervolemia. (MK)
  - Hypo- and hypernatremia. (MK)
  - Hypo- and hyperkalemia. (MK)
  - Hypo- and hypercalcemia. (MK)
  - Simple and mixed acid-base disorders. (MK)
  - Hypo- and hyperphosphatemia. (MK)
  - Hypo- and hypermagnesemia. (MK)
  - Respiratory acidosis and alkalosis. (MK)
  - Metabolic acidosis and alkalosis. (MK)
2. Presenting symptoms and signs of the above disorders. (MK)
3. The importance of total body water and its distribution. (MK)
4. The differential diagnosis of hypo- and hypernatremia in the setting of volume depletion, euolemia, and hypervolemia. (MK)
5. How to distinguish hyponatremia from pseudohyponatremia. (MK)
6. How to identify spurious hyperkalemia or acidosis-related hyperkalemia. (MK)
7. Risks of too rapid or delayed therapy for hyponatremia. (MK)
8. The most common causes of respiratory acidosis, respiratory alkalosis, metabolic acidosis and metabolic alkalosis. (MK)
9. How to calculate the anion gap and explain its relevance to determining the cause of a metabolic acidosis. (MK)
10. Changes in total body water distribution that occur with aging. (MK)
11. How altered mental status can contribute to electrolyte disorders. (MK)
12. Tests to use in the evaluation of fluid, electrolyte, and acid-base disorders. (MK)
13. Indications for obtaining an ABG. (MK)

14. The types of fluid preparations to use in the treatment of fluid and electrolyte disorders. (MK)

**B. SKILLS:** Students should demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
  - Eliciting appropriate information from patients with volume overload, including recent weight gain, edema or ascites, symptoms of heart failure, dietary sodium intake, changes in medications, noncompliance and intravenous fluid regimens. (PC, CS)
  - Eliciting appropriate information from patients with volume depletion, including recent weight loss, thirst, gastrointestinal losses, urinary losses, oral intake, insensible losses, and intravenous fluid regimens. (PC, CS)
  - Eliciting appropriate information from patients with electrolyte problems, including use of diuretics and other medications, gastrointestinal losses, and history of relevant medical conditions (e.g., heart failure, liver disease, renal disease, pulmonary disease, central nervous system disease, and malignancy). (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Measurement of orthostatic vital signs. (PC)
  - Identification of signs of volume overload including peripheral edema, pulmonary edema, ascites, edema. (PC)
  - Identification of signs of volume depletion including tachycardia, orthostatic hypotension, dry mucous membranes, poor skin turgor. (PC)
  - Identification of signs of sodium disorders including lethargy, weakness, encephalopathy, delirium, seizures. (PC)
  - Identification of signs of potassium disorders including weakness, fatigue, constipation, ileus, cramping, tetany, hypo- or hyperreflexia. (PC)
  - Identification of signs of calcium disorders including cramping, tetany, Chvostek's and Trousseau's sign, seizures, anorexia, constipation, polyuria, hypo- or hyperreflexia, stupor, coma. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history, physical exam, and laboratory findings that distinguish between:
  - Hypo- and hypervolemia. (PC, MK)
  - Hypo- and hypernatremia. (PC, MK)
  - Hypo- and hyperkalemia. (PC, MK)
  - Hypo- and hypercalcemia. (PC, MK)
  - Hypo- and hyperphosphatemia. (PC, MK)
  - Hypo- and hypermagnesemia. (PC, MK)
  - Respiratory acidosis and alkalosis. (PC, MK)
  - Metabolic acidosis and alkalosis. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
  - Serum electrolytes, BUN/Cr. (PC, MK)
  - Anion gap. (PC, MK)

- ABG. (PC, MK)
  - Serum and urine osmolality. (PC, MK)
  - Urinary sodium. (PC, MK)
  - Fractional excretion of sodium. (PC, MK)
  - ECG findings in hyper- and hypokalemia. (PC, MK)
5. **Communication skills:** Students should be able to:
- Explain to a patient and his or her family why intravenous fluids are needed. (PC, CS)
  - Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
  - Elicit input and questions from the patient and their family about the management plan. (PC, CS)
6. **Basic and advanced procedural skills:** Students should be able to:
- Insert a peripheral intravenous catheter. (PC)
  - Obtain an ABG. (PC)
  - Assist in the insertion of a central venous catheter. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Writing appropriate fluid orders for the treatment of hypo- and hypervolemia, hypo- and hypernatremia, hypo- and hyperkalemia, hypo- and hypercalcemia. (PC, MK)
  - Writing appropriate orders for replacing sodium, potassium, calcium, phosphates, and magnesium. (PC, MK)
  - Writing appropriate orders for correcting hyperkalemia, hypercalcemia, hyperphosphatemia and hypermagnesemia. (PC, MK)
  - Calculating the water deficit that needs to be corrected to treat hypernatremia. (PC, MK)
  - Identifying indications for administration of bicarbonate. (PC, MK)
  - Determining when to obtain consultation from a nephrologist. (PC, SBP)
  - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to fluid, electrolyte, and acid-base disorders. (PC SBP)
  - Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for problems related to fluid, electrolyte and acid-base disorders. (PLI, P)
3. Demonstrate ongoing commitment to self-directed learning regarding fluid, electrolyte and acid-based disorders. (PLI, P)
4. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of problems related to fluid, electrolyte and acid-base disorders. (P, SBP)

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## TRAINING PROBLEM #12: GASTROINTESTINAL BLEEDING

### **RATIONALE:**

Gastrointestinal bleeding is a common disorder which can be life-threatening if not properly diagnosed and treated. Knowledge of etiology, risk factors, approach, and management is integral to internal medicine training.

### **Prerequisites:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy, physiology, and pathophysiology of the gastrointestinal tract.
- Pharmacology of non-steroidal anti-inflammatory medication (a major contributing factor in etiology of gastrointestinal bleeding) as well as proton pump inhibitors and other agents used in the acute setting for treatment of gastrointestinal bleeding.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The common causes for and symptoms of upper and lower gastrointestinal blood loss, including:
  - Esophagitis/esophageal erosions. *(MK)*
  - Mallory Weiss tear. *(MK)*
  - Peptic and duodenal ulcer disease. *(MK)*
  - Esophageal/gastric varices. *(MK)*
  - Erosive gastritis. *(MK)*
  - Arteriovenous malformations. *(MK)*
  - Gastrointestinal tumors, benign and malignant. *(MK)*
  - Diverticulosis. *(MK)*
  - Ischemic colitis. *(MK)*
  - Hemorrhoids. *(MK)*
  - Anal fissures. *(MK)*
2. The distinguishing features of upper versus lower GI bleeding *(MK)*
3. The indications for inpatient versus outpatient evaluation and treatment *(MK)*
4. The principles of stabilization and treatment of acute massive GI blood loss. *(MK)*
5. The role of contributing factors in GI bleeding such as H. pylori infection; NSAIDs, alcohol, cigarette use, coagulopathies; and chronic liver disease. *(MK)*

**B. SKILLS:** Students should demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age appropriate history that differentiates among etiologies of disease, including:
  - Features that distinguish upper from lower GI bleeding. *(PC, CS)*
  - Quantification of degree of blood loss. *(PC, CS)*
  - Chronology and duration of bleeding. *(PC, CS)*
  - Associated symptoms. *(PC, CS)*

- Relevant past medical history. (PC, CS)
  - Medication history, including use of tobacco and alcohol. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical examination to establish the diagnosis and severity of disease, including:
    - Postural blood pressure and pulse. (PC, MK)
    - Abdominal palpation for organomegaly, masses, and tenderness. (PC, MK)
    - Search for stigmata of chronic liver disease. (PC, CS)
    - Anal and rectal examination. (PC, CS)
  3. **Differential diagnosis:** Students should be able to generate a differential diagnosis recognizing specific history and physical examination findings that suggest a specific etiology for GI bleeding. (PC, MK)
  4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.
 

Laboratory and diagnostic tests should include, when appropriate:

    - Stool and gastric fluid tests for occult blood. (MK, PC)
    - CBC. (MK, PC)
    - PT/PTT. (MK, PC)
    - Hepatic function panel. (MK, PC)
    - Tests for *Helicobacter pylori*. (MK, PC)

Students should be able to define the indications for and interpret (**with consultation**) results of:

    - Esophagogastroduodenoscopy (EGD). (MK, PC)
    - Colonoscopy. (MK, PC)
    - Barium studies of the gastrointestinal tract. (MK, PC)
  5. **Communication skills:** Students should be able to:
    - Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. (PC, CS)
    - Elicit questions from the patient and his or her family about the management plan. (PC, CS)
  6. **Basic and advanced procedural skills:** Students should be able to:
    - Start an IV line using a large bore (i.e. 18 gauge) needle. (MK, PC)
    - Perform a stool or emesis occult blood testing. (MK, PC)
  7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
    - Establishing adequate venous access. (PC, MK)
    - Administering crystalloid fluid resuscitation. (PC, MK)
    - Ordering blood and blood product transfusion. (PC, MK)
    - Determining when to obtain consultation from a gastroenterologist or a general surgeon. (PC, MK)
    - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
    - Accessing and utilizing appropriate information systems and resources to help delineate issues related to gastrointestinal bleeding. (PC, PLI)
    - Incorporating patient preferences. (PC,P)
- Outlining long-term management when appropriate (e.g. *Helicobacter pylori* eradication, antacid, H-2 blocker or proton pump inhibitor therapy, smoking /alcohol cessation, NSAID

restriction, and dietary modification. (MK, CS)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for gastrointestinal bleeding. (PLI, P)
2. Respond appropriately to patients who are nonadherent to treatment for gastrointestinal bleeding. (CS, P)
3. Demonstrate ongoing commitment to self-directed learning regarding gastrointestinal bleeding. (PLI, P)
4. Appreciate the impact gastrointestinal bleeding has on a patient's quality of life, well-being, ability to work, and the family. (P)
5. Recognize the importance and demonstrate a commitment to the utilization of
6. other health care professions in the treatment of gastrointestinal bleeding. (P, SBP)

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## TRAINING PROBLEM #13: KNEE PAIN

### **RATIONALE:**

Musculoskeletal complaints are some of the most common problems for which patients seek medical attention, and the knee is the single most common joint pain. Many of these problems can be effectively tackled in the primary care setting without need for consultation. The principles presented in this training problem can be readily applied to other joint pains.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy and physiology of the musculoskeletal system.
- Pharmacology of acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), topical medications (capsaicin and lidocaine) and glucocorticoids.
- Basic bone radiograph interpretation.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

11. A systematic approach to joint pain based on an understanding of pathophysiology to classify potential causes. *(MK)*
12. The effect of the time course of symptoms on the potential causes of joint pain (acute vs. subacute vs. chronic). *(MK)*
13. The difference between and pathophysiology of arthralgia vs. arthritis and mechanical vs. inflammatory joint pain. *(MK)*
14. The distinguishing features of intra-articular and periarticular complaints (joint pain vs. bursitis and tendonitis). *(MK)*
15. The effect of the features of joint involvement on the potential causes of joint pain (monoarticular vs. oligoarticular vs. polyarticular, symmetric vs. asymmetric, axial and/or appendicular, small vs. large joints, additive vs. migratory vs. intermittent). *(MK)*
16. Indications for performing an arthrocentesis and the results of synovial fluid analysis. *(MK)*
17. The utility of describing the relative location of knee pain (anterior, medial, lateral, posterior). *(MK)*
18. The relative frequency of the various causes of knee pain. *(MK)*
19. The differential diagnosis, pathophysiology, and typical presentations of the common intra-articular causes of knee pain:
  - Osteoarthritis. *(MK)*
  - Inflammatory arthropathies. *(MK)*
  - Crystalline arthropathies. *(MK)*
  - Septic arthritis. *(MK)*
  - Patellofemoral pain syndrome. *(MK)*
  - Cruciate ligament tear. *(MK)*
  - Meniscal damage. *(MK)*
10. The differential diagnosis, pathophysiology, and typical presentations of the common periarticular causes of knee pain:



- Collateral ligament sprain/tear. (MK)
  - Iliotibial band syndrome. (MK)
  - Prepatellar bursitis. (MK)
  - Popliteal (Baker) cyst. (MK)
11. Basic symptomatic treatment for knee pain, including:
- Relative rest. (MK)
  - Ice/heat. (MK)
  - Compression. (MK)
  - Elevation. (MK)
  - Acetaminophen. (MK)
  - Nonsteroidal anti-inflammatory drugs. (MK)
  - Glucosamine and chondroitin sulfate. (MK)
  - Physical therapy. (MK)
  - Assistive devices. (MK)
  - Topical “analgesics.” (MK)
  - Corticosteroid injection. (MK)
12. Indications for and efficacy of intra-articular corticosteroid injections. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
- Delineation of the specific features of the pain. (PC, CS)
  - Presence of stiffness, swelling, warmth, redness. (PC, CS)
  - Symptoms of instability, locking, clicking/popping, and weakness. (PC, CS)
  - History of trauma, new activities, repetitive motion. (PC, CS)
  - Impact on the patient’s ability to carry out activities of daily living. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
- Examination of the knee, including:
    - Inspection. (PC)
    - Palpation. (PC)
    - Range of motion. (PC)
    - Gait assessment. (PC)
    - Evaluation for effusion. (PC)
    - Assessment of ligamentous and cartilaginous stability. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology for knee pain. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.
- Laboratory and diagnostic tests should include, when appropriate:
- Synovial fluid analysis. (PC, MK)
- Students should be able to define the indications for and interpret (**with consultation**) the results of:
- Plain radiographs of the knee. (PC, MK)
  - CT and MRI of the knee. (PC, MK)

5. **Communication skills:** Students should be able to:
  - Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. (*PC, CS*)
  - Elicit questions from the patient and his or her family about the management plan. (*PC, CS*)
6. **Basic and advanced procedure skills:** Students should be able to:
  - Assist in the performance of an arthrocentesis and intra-articular corticosteroid injection. (*PC*)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
  - Determining when to perform an arthrocentesis. (*PC, MK*)
  - Prescribing simple, nonmedicinal symptomatic measures such as rest, ice/heat, compression, and elevation. (*PC, MK*)
  - Prescribing physical therapy and assistive devices (*PC, MK*)
  - Prescribing exercise. (*PC, MK*)
  - Counseling patients regarding weight loss. (*PC, MK*)
  - Prescribing non-narcotic analgesics and anti-inflammatory agents. (*PC, MK*)
  - Determining when to prescribe narcotic analgesics. (*PC, MK*)
  - Determining when to prescribe intra-articular corticosteroid injection. (*PC, MK*)
  - Determining when to obtain consultation from an orthopedic surgeon and rheumatologist. (*PC, MK*)
  - Using a cost-effective approach based on the differential diagnosis. (*PC, SBP*)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to knee pain. (*PC, PLI*)
  - Incorporating patient preferences. (*PC, P*)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for knee pain. (*PLI, P*)
2. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for knee pain. (*P*)
3. Respond appropriately to patients who are nonadherent to treatment for knee pain. (*CS, P*)
4. Appreciate the impact chronic knee pain has on a patient's quality of life, psychological well-being, ability to work, and the family. (*P*)
5. Recognize the importance of and demonstrate a commitment to the utilization of other health care professions in the treatment of knee pain. (*P, SBP*)
6. Appreciate the difficulty patients with limited mobility have in achieving weight loss. (*P*)
7. Demonstrate an appropriate attitude in managing patients with chronic pain. (*P*)

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## TRAINING PROBLEM #14: RASH

### RATIONALE:

Rash is an extremely common complaint. It may be the manifestation of a primary cutaneous disorder or secondary to a systemic condition. Internists see many patients with both and, therefore, must be acquainted with the diagnosis and management.

### PREREQUISITES:

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy, physiology, and pathophysiology of the skin.
- Pharmacology of glucocorticoids, antifungals, antibiotics, benzoyl peroxide, salicylic acid, and retinoids and derivatives.

### SPECIFIC LEARNING OBJECTIVES:

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

3. The standard nomenclature used to describe rashes (macule, patch, papule, nodule, plaque, vesicle, pustule, bulla, cyst, wheal, telangiectasia, petechia, purpura, erosion, ulcer). *(MK)*
4. The morphologic features used to describe potentially malignant skin lesions (**A**symmetry, **B**order, **C**olor, **D**iameter, **D**ynamic i.e. changing, **E**levation, and **E**nlargement, "ABCDE"). *(MK)*
5. The significance of focal, organ-based, and constitutional signs and symptoms in the context of a rash (e.g. rash and fever, rash and arthritis, rash and renal failure). *(MK)*
4. The differential diagnosis, pathophysiology, and typical presentations of the common causes of eczematous dermatoses:
  - Atopic dermatitis. *(MK)*
  - Contact dermatitis. *(MK)*
  - Stasis dermatitis. *(MK)*
  - Seborrheic dermatitis. *(MK)*
5. The differential diagnosis, pathophysiology, and typical presentations of the common causes of maculopapular eruptions:
  - viral exanthems. *(MK)*
  - bacterial exanthems. *(MK)*
  - erythema multiforme. *(MK)*
6. The differential diagnosis, pathophysiology, and typical presentations of the common causes of papulosquamous dermatoses:
  - Psoriasis. *(MK)*
  - Pityriasis rosea. *(MK)*
7. The differential diagnosis, pathophysiology, and typical presentations of the common causes of cutaneous infections:
  - Impetigo. *(MK)*
  - Cellulitis. *(MK)*
  - Folliculitis. *(MK)*
  - Dermatophytosis (tinea corporis, tinea capitis, tinea cruris, tinea pedis, onychomycosis). *(MK)*

- Tinea versicolor. (MK)
  - Candidiasis. (MK)
  - Condylomata. (MK)
  - Herpes zoster. (MK)
8. The prevention of community acquisition of Methicillin-resistant Staphylococcus aureus (MRSA), including good hygiene practices:
    - Keeping hands clean by washing thoroughly with soap and water or using an alcohol-based sanitizer. (MK)
    - Keeping cuts and scrapes clean and covered with a bandage until healed. (MK)
    - Avoiding contact with other people's wounds or bandages. (MK)
    - Avoiding sharing personal items such as towels and razors. (MK)
  9. The differential diagnosis, pathophysiology, and typical presentations of the common causes of pustular diseases:
    - Acne. (MK)
    - Rosacea. (MK)
  10. The differential diagnosis, pathophysiology, and typical presentations of the common causes of cutaneous ulcers.
    - Venous insufficiency. (MK)
    - Peripheral arterial disease. (MK)
    - Neuropathic. (MK)
  11. The significance of palpable purpura and other cutaneous findings of vasculitis. (MK)
  12. The differential diagnosis, pathophysiology, and typical presentations of the common causes of urticaria and angioedema. (MK)
  13. The differential diagnosis, pathophysiology, and typical presentations of drug eruptions. (MK)
  14. The differential diagnosis, pathophysiology, and typical presentations of the common causes of benign neoplasms and hyperplasias:
    - Seborrheic keratosis. (MK)
    - Epidermoid cyst. (MK)
  15. The differential diagnosis, pathophysiology, and typical presentations of the common causes of premalignant lesions and malignancies:
    - Actinic keratosis. (MK)
    - Basal cell carcinoma. (MK)
    - Squamous cell carcinoma. (MK)
    - Malignant melanoma. (MK)
  16. The differential diagnosis, pathophysiology, and typical presentations of the cutaneous manifestations of sexually transmitted diseases.
    - Syphilis. (MK)
    - Disseminated gonorrhea infection. (MK)
    - Human papilloma virus. (MK)
    - Herpes simplex virus. (MK)
  17. The differential diagnosis, pathophysiology, and typical presentations of the cutaneous manifestations of internal/systemic diseases. (MK)
  18. The general indications for skin biopsy. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
  - Evolution (site of onset, manner of spread, duration). (PC, CS)

- Symptoms associated with the rash (pruritis, pain, photosensitivity, malaise, fever, arthralgias). (PC, CS)
  - Past medical history of systemic diseases known to have cutaneous manifestation. (PC, CS)
  - Sexual history. (PC, CS)
  - Medication usage and allergies. (PC, CS)
  - Skin care product usage. (PC, CS)
  - Chemical skin exposure. (PC, CS)
  - Sun exposure. (PC, CS)
  - Travel history. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease including:
- Description of the type of primary skin lesion (macule, patch, papule, nodule, plaque, vesicle, pustule, bulla, cyst, wheal, telangiectasia, petechia, purpura, erosion, ulcer). (PC)
  - Description of the shape, margination, color, arrangement, and distribution of the individual lesions. (PC)
  - Describe potentially malignant lesions in terms of **A**symmetry, **B**order, **C**olor, **D**iameter, **E**levation, and **E**nlargement (“ABCDE”). (PC)
  - Presence of exudates: dry (crust) or wet (weeping) exudates. (PC)
  - Presence of scale or lichenification. (PC)
  - Palpation of lesions for consistency, alteration of temperature, mobility, and tenderness. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology for a rash. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.  
Laboratory and diagnostic tests should include, when appropriate:
- KOH preparation. (PC, MK)
  - CBC with differential. (PC, MK)
  - RPR and VDRL. (PC, MK)
  - Bacterial culture. (PC, MK)
- Students should be able to **define the indications for and interpret (with consultation)** the significance of the results of:
- Skin biopsy. (PC, MK)
5. **Communication skills:** Students should be able to:
- Explain the dangers of excess sun exposure. (PC, CS)
  - Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
  - Elicit questions from the patient and his or her family about the management plan. (PC, CS)
  - Counsel patients regarding the prevention of community acquisition of MRSA. (PC, CS)
6. **Basic and advanced procedural skills:** Students should be able to:
- Perform a skin scraping and KOH preparation. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Determining when to perform a skin scraping and KOH preparation. (MK, PC)
  - Determining when to obtain tests appropriate for the diagnosis of systemic medical

conditions suspected as the cause of rash. (MK, PC)

- Prescribing a simple hypoallergenic skin care regimen. (MK, PC)
- Prescribing appropriate moisturizing/emollient treatment. (MK, PC)
- Discussing the importance of and prescribing sunscreen use. (PC, MK, CS)
- Prescribing appropriate treatment for eczematous dermatoses, mild psoriasis, common cutaneous skin infections, acne, rosacea, venous stasis dermatitis and ulcers, and common drug eruptions. (PC, MK)
- Determining when to obtain a consultation from a dermatologist. (PC)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to common dermatologic complaints. (PC, PLI)
- Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

3. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for rashes. (PLI, P)
4. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for rashes. (P)
5. Appreciate the impact rashes have on a patient's quality of life, well-being, ability to work, and the family. (P)

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- ⇒ Community-Associated MRSA  
Division of Healthcare Quality Promotion  
National Center for Infectious Diseases  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
[www.cdc.gov/ncidod/dhqp/ar\\_mrsa\\_ca.html](http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca.html)

## TRAINING PROBLEM #15: UPPER RESPIRATORY COMPLAINTS

### **RATIONALE:**

Upper respiratory tract infections (URIs) are some of the most common problems for which patients seek medical attention. Many patients inappropriately receive antibiotic therapy for these mostly viral infections.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy and physiology of the upper airway, Eustachian tubes, and sinuses.
- Anatomy and physiology of the respiratory system.
- Pathogenesis and pathophysiology of upper respiratory tract diseases.
- Microbial pathogens associated with upper respiratory tract infections.
- Pharmacology of antibiotics.

### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. A rational approach to the common URIs: nasal congestion, rhinorrhea, facial pain/tenderness, cough, sputum production, sore throat, and ear pain. *(MK)*
2. Common constitutional symptoms that accompany URIs: generalized weakness, fatigue, malaise, headache, mild myalgias, and modest fever. *(MK)*
3. The microbiology of URIs, highlighting the relative frequencies of viral and bacterial etiologies. *(MK)*
4. The most common microbiologic agents that cause the common URIs. *(MK)*
5. The pathophysiology and typical clinical presentation of the common URIs:
  - Common cold. *(MK)*
  - Acute bronchitis. *(MK)*
  - Pharyngitis. *(MK)*
  - Acute sinusitis. *(MK)*
  - Otitis media. *(MK)*
6. The pathophysiologic similarities between the common cold and acute sinusitis. *(MK)*
7. The clinical features and microbiology of acute compared to chronic sinusitis. *(MK)*
8. The pathophysiology and symptomatology of allergic rhinitis and the clinical features that may help differentiate it from the common cold and acute sinusitis. *(MK)*
9. The clinical features that may help differentiate the common URIs from influenza. *(MK)*
10. The pathophysiology and clinical features of acute compared to chronic bronchitis. *(MK)*
11. The pathophysiology and clinical features of acute bronchitis compared to pneumonia. *(MK)*
12. The pathophysiology and clinical features of otitis media and Eustachian tube malfunction. *(MK)*
13. The signs and symptoms that may help distinguish viral from bacterial pharyngitis. *(MK)*
14. Symptomatic treatment for URIs and the major side effects/contraindications for these treatments, including:
  - Decongestants. *(MK)*
  - Non-selective antihistamines. *(MK)*



- Mucolytics. (MK)
  - Cough suppressants. (MK)
  - Pain relievers/fever reducers. (MK)
15. The general role of antibiotics in the treatment of URIs and specific evidence-based indications for them. (MK)
  16. The basic elements of the treatment of allergic rhinitis. (MK)
  17. The use of antiviral agents in the prophylaxis and treatment of influenza. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - The predominant symptom (nasal congestion/rhinorrhea, purulent nasal discharge with facial pain/tenderness, sore throat, cough with or without sputum, sore throat or ear pain). (PC, CS)
  - Constitutional symptoms. (PC, CS)
  - Symptoms of potential pneumonia. (PC, CS)
  - History of or symptoms of serious cardiopulmonary diseases (e.g. asthma, chronic obstructive pulmonary disease, congestive heart failure) that may alter the treatment plan. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Examination of the nasal cavity, pharynx, and sinuses. (PC)
  - Otoscopic examination. (PC)
  - Evaluation of the head and neck for lymphadenopathy. (PC)
  - Auscultation of the lungs to distinguish pulmonary consolidation, pleural effusion, pulmonary congestion, and chronic obstructive pulmonary disease. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology of upper respiratory complaints:
  - Common cold. (PC, MK)
  - Acute sinusitis. (PC, MK)
  - Chronic sinusitis. (PC, MK)
  - Allergic rhinitis. (PC, MK)
  - Pharyngitis. (PC, MK)
  - Otitis media. (PC, MK)
  - Otitis externa. (PC, MK)
  - Acute bronchitis. (PC, MK)
  - Chronic bronchitis. (PC, MK)
  - Influenza. (PC, MK)
  - Pneumonia. (PC, MK)
  - Infectious mononucleosis. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences Laboratory and diagnostic tests should include, when appropriate:
  - CBC with differential. (PC)
  - Rapid strep test. (PC)

- Throat culture. (PC)
  - Chest radiograph. (PC)
  - PFTs. (PC)
  - Monospot/heterophile antibody. (PC)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (CS)
  - Elicit questions from the patient and his or her family about the management plan. (CS)
  - Explain the microbiologic origin of most URIs and why antibiotics are generally ineffective. (CS)
  - Explain the importance of antimicrobial resistance. (CS)
6. **Basic and advanced procedure skills:**
- Throat culture. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Determining when to obtain a chest radiograph. (PC, MK)
  - Determining when to prescribe antibiotics. (PC, MK)
  - Selecting the most appropriate antibiotic for acute bacterial sinusitis, streptococcal pharyngitis, and bacterial otitis media. (PC, MK)
  - Prescribing symptomatic treatments. (PC, MK)
  - Determining when to obtain consultation from an allergist, otolaryngologist, or pulmonologist. (PC, SBP)
  - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to URIs. (PC, PLI)
  - Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

- 1 Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for common URI complaints. (P, PLI)
- 2 Appreciate the impact common URI complaints have on a patient's quality of life, well-being, ability to work, and the family. (P)
- 3 Discuss the patient's perspective regarding the use of antibiotics for URIs. (CS, P)
- 4 Discuss the role physicians play in the over-prescribing of antibiotics for URIs. (P)
- 5 Discuss the importance of antimicrobial resistance from the point of view of the individual and society at large. (P)

**D. REFERENCES:**

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National Immunization Program  
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U.S. Department of Health and Human Services  
**[www.cdc.gov/nip/publications/pertussis/guide.htm](http://www.cdc.gov/nip/publications/pertussis/guide.htm)**
- ⇒ Get Smart. Know When Antibiotics Work  
National Campaign for Appropriate Antibiotic Use  
Division of Bacterial and Mycotic Diseases  
National Center for Infectious Diseases  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/drugresistance/community/](http://www.cdc.gov/drugresistance/community/)**

## TRAINING PROBLEM #16: ACUTE MYOCARDIAL INFARCTION

### **RATIONALE:**

Cardiovascular disease is the number one killer of Americans. Many associated risk factors are quite modifiable. Proper urgent management of acute myocardial infarctions significantly reduces mortality.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy and physiology of the heart and coronary vessels.
- Risk factors for and pathogenesis/pathophysiology of atherosclerosis.
- Pharmacology of aspirin, morphine, nitroglycerine, heparin, antiplatelet agents, thrombolytic agents, beta-blockers, angiotensin converting enzyme inhibitors (ACE-I), angiotensin II receptor blockers (ARB), and HMG-CoA reductase inhibitors.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The primary and secondary prevention of ischemic heart disease through the reduction of cardiovascular risk factors (e.g. controlling hypertension and dyslipidemia, aggressive diabetes management, avoiding tobacco, and aspirin prophylaxis). *(MK)*
2. The basic principles of the role of genetics in CAD. *(MK)*
3. Pathogenesis, signs, and symptoms of the acute coronary syndromes:
  - Unstable angina. *(MK)*
  - Non-ST-elevation myocardial infarction (NSTEMI). *(MK)*
  - ST-elevation myocardial infarction (STEMI). *(MK)*
4. Atypical presentations of cardiac ischemia/infraction. *(MK)*
5. The typical clinical course of the acute coronary syndromes. *(MK)*
6. ECG findings and macromolecular markers (myoglobin, CK-MB, Troponin-I, Troponin-T) of acute ischemia/MI. *(MK)*
7. The utility of echocardiography in acute MI. *(MK)*
8. The importance of monitoring for and immediate treatment of ventricular fibrillation in acute MI. *(MK)*
9. Therapeutic options for acute MI and how they may differ for NSTEMI and STEMI, including:
  - Aspirin. *(MK)*
  - Morphine. *(MK)*
  - Nitroglycerine. *(MK)*
  - Oxygen. *(MK)*
  - Heparin. *(MK)*
  - Antiplatelet agents (glycoprotein IIb/IIIa inhibitors). *(MK)*
  - Beta-blockers. *(MK)*
  - ACE-I/ARB. *(MK)*
  - HMG-CoA reductase inhibitors. *(MK)*
  - Thrombolytic agents. *(MK)*

- Emergent cardiac catheterization with percutaneous coronary intervention. *(MK)*
10. Pathogenesis, signs, and symptoms of the complications of acute MI, including arrhythmias, reduced ventricular function, cardiogenic shock, pericarditis, papillary muscle dysfunction/rupture, acute valvular dysfunction, and cardiac free wall rupture. *(MK)*
  11. The general approach to the evaluation and treatment of ventricular tachycardia and fibrillation. *(MK)*
  12. The importance of post-MI risk stratification, including the burden of residual coronary disease and assessment of left ventricular function. *(MK)*
  13. Basic principles of cardiac rehabilitation. *(MK)*
  14. Indications for coronary artery bypass grafting (CABG). *(MK)*
  15. The Centers for Medicare & Medicaid Services (CMS) and the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) quality measures for acute MI treatment. *(MK, PLI, SBP)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
  - Cardiac risk factors. *(PC, CS)*
  - Location, duration, intensity, exacerbating/ameliorating factors, radiation of chest pain. *(PC, CS)*
  - Symptoms associated with chest pain (e.g. nausea, emesis, dyspnea, diaphoresis, palpitations, dizziness, syncope, heartburn belching, etc.). *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease including:
  - Recognition of dyspnea and anxiety. *(PC)*
  - Accurate measurement of vital signs. *(PC)*
  - Examination of the heart and vascular system. *(PC)*
  - Examination of the lungs. *(PC)*
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology of chest pain:
  - Stable angina. *(PC, MK)*
  - Coronary vasospasm. *(PC, MK)*
  - Unstable angina. *(PC, MK)*
  - Acute MI. *(PC, MK)*
  - Pericarditis. *(PC, MK)*
  - Aortic dissection. *(PC, MK)*
  - Pulmonary embolism. *(PC, MK)*
  - Other noncardiac causes of chest pain. *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences  
 Laboratory and diagnostic tests should include, when appropriate:
  - ECG. *(PC, MK)*
  - Chest radiograph. *(PC, MK)*
  - Macromolecular markers (myoglobin, CK-MB, Troponin-I, Troponin- T). *(PC, MK)*
 Students should be able to define the indications for and interpret (**with consultation**) the

results of:

- Echocardiogram. (PC, MK)
  - Cardiac stress testing. (PC, MK)
  - Coronary angiography. (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. (PC, CS)
  - Elicit questions from the patient and his or her family about the diagnostic and management plan. (PC, CS)
  - Educate patients about modifying cardiac risk factors. (PC, CS)
6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Medical management of acute MI. (PC, MK)
  - CCU monitoring. (PC, MK)  
Indications for and complications of thrombolytic therapy, cardiac catheterization with percutaneous coronary intervention, and CABG. (PC, MK)
  - Proper pre-discharge risk stratification. (PC, MK)
  - Secondary risk factor modification. (PC, MK)
  - Determining when to obtain consultation from a cardiologist and cardiothoracic surgeon. (PC, SBP)
  - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to acute MI. (PC, PLI)
  - Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate a commitment to meeting national quality standards for the care of patient with acute MI. (P, PLI, SBP)
2. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for acute MI. (PLI, P)
3. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for acute MI. (P)
4. Demonstrate ongoing commitment to self-directed learning regarding acute MI. (PLI, P)
5. Appreciate the impact acute MI has on a patient's quality of life, well-being, ability to work, and the family. (P)
6. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the treatment of acute MI. (P, SBP)

**D. REFERENCES:**

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## TRAINING PROBLEM #17: ACUTE RENAL FAILURE AND CHRONIC KIDNEY DISEASE

### **RATIONALE:**

Renal disease is a common problem in internal medicine and may manifest with symptoms referable to the kidney as well as other systems. Patients who go on to end-stage renal disease have high morbidity and mortality, despite advances in dialysis treatment. Thus, an understanding of chronic kidney disease is useful to all physicians. A rational approach to patients with suspected or known acute renal failure allows students and clinicians to quickly assess the etiology and initiate treatment without unnecessary delay in an effort to prevent the development of chronic kidney disease.

### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of pathogenesis and pathophysiology of acute renal failure and the development of chronic kidney disease.
- Understanding of drugs that can have adverse effect on renal function.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe and discuss:

1. The distinction between the three major pathophysiologic etiologies for acute renal failure (ARF):
  - Decreased renal perfusion (prerenal). *(MK)*
  - Intrinsic renal disease (renal). *(MK)*
  - Acute renal obstruction (postrenal). *(MK)*
2. The pathophysiology of the major etiologies of “prerenal” ARF, including:
  - Hypovolemia. *(MK)*
  - Decreased cardiac output. *(MK)*
  - Systemic vasodilation. *(MK)*
  - Renal vasoconstriction. *(MK)*
3. The pathophysiology of the major etiologies of intrinsic “renal” ARF, including:
  - Vascular lesions. *(MK)*
  - Glomerular lesions. *(MK)*
  - interstitial nephritis. *(MK)*
  - Intra-tubule deposition/obstruction. *(MK)*
  - Acute tubular necrosis (ATN). *(MK)*
4. The pathophysiology of the major etiologies of “postrenal” ARF, including:
  - Urethral (e.g. tumors, calculi, clot, sloughed papillae, retroperitoneal fibrosis, lymphadenopathy). *(MK)*
  - Bladder neck (e.g. tumors, calculi, prostatic hypertrophy or carcinoma, neurogenic). *(MK)*
  - Urethral (e.g. stricture, tumors, obstructed indwelling catheters). *(MK)*



5. The pathophysiology and clinical findings of uremia. *(MK)*
6. The natural history, initial evaluation and treatment, and complications of ARF. *(MK)*
7. The most common etiologies of chronic kidney disease (CKD):
  - DM. *(MK)*
  - Hypertension. *(MK)*
  - Glomerulonephritis. *(MK)*
  - Polycystic kidney disease. *(MK)*
  - Autoimmune diseases (e.g. systemic lupus erythematosus). *(MK)*
  - The staging scheme for CKD. *(MK)*
8. The significance for proteinuria in CKD. *(MK)*
9. The use of ACE-Is and ARBs in the management of CKD. *(MK)*
10. The importance of secondary hyperparathyroidism in CKD. *(MK)*
11. The pathophysiology of anemia in CKD. *(MK)*
12. The value of glycemic and hypertension control in limiting the progression of CKD. *(MK)*
13. The value of CAD risk factor modification in patients with CKD, particularly those treated with dialysis. *(MK)*
14. The basic principles of renal replacement therapy (e.g., hemodialysis and peritoneal dialysis) as well as the complications. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate history that distinguishes among the three major reasons for ARF (pre-renal, renal, post-renal), including the predisposing conditions, nephrotoxic drugs or agents, and systemic disease and the major causes of CKD. *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical examination to establish the diagnosis and severity of disease, including:
  - The determination of a patient's volume status through estimation of the central venous pressure using the height of jugular venous distention and measurement of pulse and blood pressure in the lying/standing position. *(PC)*
  - Palpation and percussion of the bladder to recognize bladder distention. *(PC)*
  - Palpation of the prostate. *(PC)*
  - Determination of the presence of pulmonary edema, peripheral edema, ascites, and signs of heart failure. *(PC)*
  - Findings consistent with uremia. *(PC)*
  - Examination for evidence of systemic disease, including but not limited to: skin, joints, and nails. *(PC)*
3. **Differential diagnosis:** Students should be able to generate a differential diagnosis for a patient with ARF or CKD recognizing specific history, physical exam, and laboratory findings that suggest a specific etiology. *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
  - Serum electrolytes, BUN/Cr, calcium, phosphorus. *(PC, MK)*
  - Urine sodium. *(PC, MK)*
  - Serum and urine osmolality. *(PC, MK)*
  - Anion gap. *(PC, MK)*

- ABG (PC, MK)
- Serum BUN to Cr ratio. (PC, MK)
- CBC, ferritin. (PC, MK)
- Performing and interpreting a urinalysis, including microscopic examination for casts, red blood cells, white blood cells, and crystals. (PC, MK)
- Calculating fractional excretion of sodium and appreciate its usefulness in distinguishing between pre-renal and intrinsic renal disease. (PC, MK)
- Calculating creatinine clearance using the Cockcroft-Gault or MDRD (“modification of diet in renal disease study”) equations. (PC, MK)
- Serum parathyroid hormone level. (PC, MK)
- ECG findings in hyperkalemia. (PC, MK)

Students should be able to define the indications for and interpret (**with consultation**) results of:

- Renal ultrasonography. (PC, MK)
5. **Communication skills:** Students should be able to:
    - Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
    - Elicit questions from the patient and his or her family about the management plan. (PC, CS)
    - Counsel patients regarding a renal diet. (PC, CS)
  6. **Basic and advanced procedure skills:** Students should be able to:
    - Insert a peripheral intravenous catheter. (PC)
    - Place a urinary catheter. (PC)
    - Obtain an ABG. (PC)
  7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients, including:
    - Designing an appropriate management plan for initial management of ARF, including volume management, dietary recommendations, drug dosage alterations, electrolyte monitoring, and indications for dialysis. (PC, MK)
    - Developing a management plan to effectively treat HTN and DM. (PC, MK)
    - Recommending treatment with phosphate binders, calcium replacement, and vitamin D replacement. (PC, MK)
    - Recommending treatment for dyslipidemia. (PC, MK)
    - Recommending treatment for anemia secondary to CKD. (PC, MK)
    - Recommending acute treatment for hyperkalemia. (PC, MK)
    - Determining when to obtain consultation from a nephrologist. (PC, MK)
    - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
    - Accessing and utilizing appropriate information systems and resources to help delineate issues related to renal failure. (PC, PLI)
    - Incorporating patient preferences. (PC, P)
- C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:
3. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for ARF and CKD. (PLI, P)
  4. Respond appropriately to patients who are nonadherent to treatment for renal failure. (CS, P)
  5. Demonstrate ongoing commitment to self-directed learning regarding renal failure. (PLI, P)
  4. Appreciate the impact renal failure has on a patient’s quality of life, wellbeing, ability to work, and the family. (P)

5. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of renal failure. (*P, SBP*)

**D. REFERENCES:**

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## TRAINING PROBLEM #18: COMMON CANCERS

### **RATIONALE:**

A skillful initial workup for suspected cancer is an essential part of effective primary care practice. Developing a logical and practical diagnostic approach to the more common cancers (e.g. skin, colorectal, lung, breast, cervical, and prostate) is an excellent means of honing basic history-taking, physical examination, and communication skills and learning how to use diagnostic studies in a cost effective manner. Encountering patients in whom cancer is a diagnostic possibility will stimulate learning of the important clinical presentations and natural histories of these life-threatening conditions. Focusing on cancer diagnosis helps to concentrate the student's learning and avoids premature immersion in the often very technical and specialized issues of cancer treatment.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy, physiology, and pathophysiology of common cancers.
- Basic knowledge of the common symptoms and signs of the most common cancers.
- Knowledge of basic concepts of clinical epidemiology pertinent to test selection and interpretation (e.g. sensitivity, specificity, positive predictive value, negative predictive value).

### **SPECIFIC LEARNING OBJECTIVES:**

- A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:
3. Primary prevention measures for common cancers. (MK)
  4. Current screening recommendations for skin, colorectal, lung, breast, cervical, and prostate cancer. (MK)
  3. Principle clinical presentations, clinical courses, complications, and causes of death for the most common cancers (e.g. skin, colorectal, lung, breast, cervical, and prostate). (MK)
  4. Basic methods of initial evaluation, including the sensitivity and specificity of basic diagnostic studies and indication for their use, including:
    - Indications for skin biopsy in a patient with a suspicious skin lesion. (MK)
    - Indications for colonoscopy in individuals a risk for colon cancer. (MK)
    - Indications for breast biopsy in a patient with a breast nodule or abnormal screening mammogram. (MK) Indications for a lymph node biopsy in a patient with suspicious lymphadenopathy. (MK)
    - Initial cost-effective workups for: isolated pleural effusion, pulmonary nodule, liver nodule, prostate nodule, elevated prostate-specific antigen, testicular nodule, stool test positive for occult blood, abnormal
    - Pap smear, and other findings suggestive of gastrointestinal and urogenital cancers. (MK)
  5. Genetic considerations of selected cancers (e.g. hereditary nonpolyposis colon cancer, familial adenomatous polyposis, BRCA1/BRCA2, HER2, Philadelphia chromosome/BRC-ABL). (MK)
  6. The role of human papilloma virus in cervical cancer. (MK)
  7. The similarities and differences between curative and palliative cancer care. (MK)
  8. The principles of palliative care and hospice care. (MK)
  9. Symptoms sometimes seen during end-of-life care and the basic principles of their

management (e.g., pain, dyspnea, nausea and vomiting, anorexia, fatigue, depression, delirium, constipation). (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - Unintentional weight loss, fever, bone pain. (PC, CS)
  - Sun exposure history, abnormal skin lesions. (PC, CS)
  - Blood in the stool, alterations in bowel movements, abdominal pain, abdominal mass. (PC, CS)
  - Smoking, cough, hemoptysis, chest pain, dyspnea. (PC, CS)
  - Breast nodules and secondary signs of breast cancer. (PC, CS)
  - Abnormal vaginal bleeding. (PC, CS)
  - Abnormal urinary symptoms. (PC, CS)
  - Lymphadenopathy. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Skin examination. (PC)
  - Digital rectal examination. (PC)
  - Breast examination. (PC)
  - Lymph node examination. (PC)
  - Male genital examination and prostate examination. (PC)
  - Pelvic examination and Pap smear. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology for:
  - Unintentional weight loss. (PC, MK)
  - Fever. (PC, MK)
  - Abnormal skin lesions. (PC, MK)
  - Occult blood positive stool. (PC, MK)
  - Colorectal mass. (PC, MK)
  - Chronic cough, hemoptysis, pulmonary nodule, and pleural effusion. (PC, MK)
  - Breast mass. (PC, MK)
  - Abnormal Pap smear. (PC, MK)
  - Abdominal or pelvic mass. (PC, MK)
  - Prostate nodule and elevated prostate specific antigen. (PC, MK)
  - Lymphadenopathy. (PC, MK)
5. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.

Laboratory and diagnostic tests should include, when appropriate:

- CBC. (PC)
- Electrolytes, BUN/Cr, Ca, hepatic function panel. (PC)
- Stool occult blood testing. (PC)
- PSA. (PC)

Students should be able to define the indications for and interpret (**with consultation**) the significance of the results of:

- Skin biopsy. (PC)
- Mammogram. (PC)
- Breast biopsy. (PC)
- Colon/rectal biopsy. (PC)
- Lung biopsy. (PC)
- Pap smear. (PC)
- Prostate biopsy. (PC)
- Lymph node biopsy. (PC)

5. **Communication skills:** Students should be able to:

- Communicate the diagnostic plan and subsequent follow-up to patients. (PC, CS)
- Elicit questions from the patient and his or her family about the management plan. (PC, CS)
- With guidance and direct supervision, participate in breaking bad news to patients. (PC, CS)
- With guidance and direct supervision, participate in discussing basic issues regarding advance directives with the patient and his or her family. (PC, CS)
- With guidance and direct supervision participate in discussing basic end-of-life issues with the patient and his or her family. (PC, CS)

6. **Basic and advanced procedure skills:** Students should be able to:

- Cervical Pap smear. (PC)
- Stool occult blood testing. (PC)

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Initial work-up of the symptom, sign, or abnormal laboratory value suspected to be due to cancer. (PC)
- Provision of support and information for the patient. (PC)
- Coordination of care for workup. (PC, SBP)
- Determining when to obtain consultation from appropriate specialists. (PC, SBP)
- A cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to common cancers. (PC, PLI)
- Incorporating patient needs and preferences. (PC, P)
- Appropriately assessing and treating pain when necessary with nonnarctoic and narcotic analgesics. (PC)
- Anticipating and treating narcotic side effects if necessary. (PC)
- Adjusting the therapeutic plan when goals of care change (e.g., a shift toward palliative care). (PC)
- Alleviation of symptoms sometimes seen during end of life care (e.g., pain, dyspnea, nausea and vomiting, anorexia, fatigue, depression, delirium, constipation). (PC)
- Utilizing supportive care or hospice service when appropriate. (PC, SBP)

C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Appreciate the uncertainty and fear patients experience when cancer is a significant diagnostic possibility. (P)
2. Respect the patient's right to refuse cancer screening. (P)
3. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based

considerations in the selection diagnostic and therapeutic interventions for common cancers. (PLI, P)

4. Recognize the importance of patient preferences when selecting among diagnostic options for common cancers. (P)
5. Demonstrate ongoing commitment to self-directed learning regarding common cancers. (PLI, P)
6. Appreciate the impact common cancers have on a patient's quality of life, well-being, ability to work, and the family. (P)
7. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professions in the workup and treatment of common cancers. (P, SBP)

**D. REFERENCES:**

- ⇒ National Cancer Institute  
National Institutes of Health  
**www.cancer.gov**
- ⇒ Guide to Clinical Preventive Services  
U.S. Preventative Services Task Force (USPSTF)  
Agency for Healthcare Research and Quality  
U.S. Department of Health and Human Services  
**www.ahrq.gov/clinic/cps3dix.htm#cancer**
- ⇒ American Cancer Society  
**www.cancer.org**
- ⇒ NCCN Clinical Practice Guidelines in Oncology National Comprehensive Cancer Network  
**www.nccn.org/professionals/physician\_gls/default.asp**

## TRAINING PROBLEM #19: COPD/OBSTRUCTIVE AIRWAYS DISEASE

### **RATIONALE:**

The chronic obstructive pulmonary diseases (chronic bronchitis and emphysema) are important causes of morbidity and mortality and are a major cause of total disability, second only to coronary artery disease. Cigarette smoking plays a major role in the progression of the disease, with survival rates lower among patients who continue to smoke cigarettes. The severity and debilitation of these disorders make them an important training problem for all third year medical students. The number of new cases of asthma is dramatically increasing. Most cases with appropriate treatment can have minimal symptoms.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Normal structure and function of the heart and lungs and how these are altered in respiratory system diseases.
- Pathogenesis and pathophysiology of pulmonary diseases.
- Pharmacology of bronchodilators, corticosteroids, and antibiotics.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The epidemiology, risk factors, symptoms, signs, and typical clinical course of the common forms of COPD, including chronic bronchitis and emphysema. *(MK)*
2. Common causes of acute exacerbations of COPD (AECOPD), including:
  - Acute infectious bronchitis. *(MK)*
  - Pneumonia. *(MK)*
  - Pulmonary edema. *(MK)*
  - Poor air quality (e.g. ozone, pollutants, tobacco smoke). *(MK)*
  - Occupational exposures. *(MK)*
  - Medical noncompliance. *(MK)*
3. The etiology, pathogenesis, evaluation, and management of hypoxemia and hypercapnia. *(MK)*
4. The genetics and role of alpha-1 antitrypsin deficiency in some patients with emphysema. *(MK)*
5. The epidemiology, risk factors, symptoms, signs, and typical clinical course of asthma. *(MK)*
6. Allergic and non-allergic factors that may precipitate bronchospasm and exacerbate asthma, including:
  - Grass and tree pollen. *(MK)*
  - Animal dander. *(MK)*
  - Cockroaches. *(MK)*
  - Dust mites. *(MK)*
  - Allergic rhinitis/post-nasal drip. *(MK)*



- Acute/chronic infectious sinusitis. (MK)
  - Acute infectious bronchitis. (MK)
  - Pneumonia. (MK)
  - Pulmonary edema. (MK)
  - Exercise. (MK)
  - Anxiety/stress. (MK)
  - Poor air quality (e.g. ozone, pollutants, tobacco smoke). (MK)
  - Occupational exposures. (MK)
  - Medical noncompliance. (MK)
7. Therapies for COPD and asthma, including:
- Beta-agonist bronchodilators. (MK)
  - Anticholinergic bronchodilators. (MK)
  - Leukotriene inhibitors. (MK)
  - Mast cell stabilizers. (MK)
  - Theophylline. (MK)
  - Inhaled corticosteroids. (MK)
  - Systemic corticosteroids. (MK)
  - Antimicrobial agents. (MK)
  - Supplemental oxygen. (MK)
  - Immunotherapy. (MK)
8. The indications for and the efficacy of influenza and pneumococcal vaccines. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease including:
- Existence, duration, and severity of dyspnea, orthopnea, paroxysmal nocturnal dyspnea, cough, sputum production, wheezing, fever, chills, sweats, chest pain, hemoptysis. (PC, CS)
  - Smoking history and passive exposure to tobacco smoke. (PC, CS)
  - Occupational history. (PC, CS)
  - Family history of pulmonary problems. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease including:
- Accurately determining respiratory rate and level of respiratory distress. (PC)
  - Assessing the use of accessory muscles for breathing. (PC)
  - Identifying bronchial breath sounds, rales, rhonchi, and wheezes. (PC)
  - Identifying signs of pulmonary consolidation, pleural effusion, and pneumothorax. (PC)
  - Identifying the signs of pulmonary hyperresonance/hyperexpansion. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a diagnosis of chronic bronchitis, emphysema, asthma, or other conditions with similar findings.
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.
- Laboratory and diagnostic tests should include, when appropriate:

- Pulse oximetry. (PC, MK)
  - ABG. (PC, MK)
  - Chest radiograph. (PC, MK)
  - Pulmonary function tests. (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
  - Elicit questions from the patient and his or her family about the management plan. (PC, CS)
  - Counsel patients about smoking cessation. (PC, CS)
  - Counsel patients about the performance of home peak flow monitoring. (PC, CS)
  - Counsel patients about environmental controls. (PC, CS)
  - Encourage asthma patients to be involved in their own disease management and counsel them about an “asthma action plan.” (PC, CS)
6. **Basic and advanced procedure skills:** Students should be able to:
- Obtain an ABG. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- The use of bronchodilators and inhaled corticosteroids. (PC, MK)
  - The key components of the care of patients admitted with acute exacerbations of COPD and asthma. (PC, MK)
  - Using systemic corticosteroids appropriately. (PC, MK)
  - Judicious use of antimicrobial agents. (PC, MK)
  - The principles of oxygen therapy. (PC, MK)
  - Determining when to obtain consultation from a pulmonologist or allergist/immunologist. (PC, SBP)
  - Smoking cessation strategies. (PC)
  - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to COPD and asthma. (PC, PLI)
  - Incorporating patient preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

- 1 Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for COPD and asthma. (PLI, P)
- 2 Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for COPD and asthma (P)
- 3 Respond appropriately to patients who are nonadherent to treatment for COPD and asthma. (CS, P)
- 4 Appreciate the impact of working, living, and environmental conditions on the development and progression of respiratory tract disease; demonstrate understanding that patients are often unable to change these factors on their own. (P)
- 5 Demonstrate ongoing commitment to self-directed learning regarding COPD and asthma. (PLI, P)
- 6 Appreciate the impact COPD and asthma have on a patient’s quality of life, well-being, ability to work, and the family. (P)
- 7 Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the diagnosis and treatment of COPD and asthma. (P, SBP)

- 8 Appreciate the importance of antimicrobial resistance. (P)
9. Show understanding for the difficulties patients face with smoking cessation. (P)

**D. REFERENCES:**

- ⇒ National Heart Lung and Blood Institute/World Health Organization Global Initiative for Chronic Obstructive Lung Disease Diagnosis, management, and prevention of chronic obstructive pulmonary disease  
**www.goldcopd.com**
- ⇒ National Institutes of Health, National Heart, Lung, and Blood Institute National Asthma Education and Prevention Program Practical Guide for the Diagnosis and Management of Asthma NIH Publication 97-4074. Bethesda, MD. 2003.  
**http://www.nhlbi.nih.gov/health/indexpro.htm**
- ⇒ Celli BR, MacNee W. Standards for the diagnosis and treatment of patients with COPD: a summary of the ATS/ERS position paper. *Eur Respir J* 2004;23:932-46.

## TRAINING PROBLEM #20: DIABETES MELLITUS

### **RATIONALE:**

Diabetes mellitus is an increasingly prevalent illness in the United States. It is estimated that five to nine percent of American adults are diabetic with the illness appearing at earlier ages in some populations. It is a leading cause of disability and death. Over 130 billion health care dollars are spent on diabetes annually. All internists must identify those at risk and institute appropriate management to ameliorate the potentially fatal complications of this illness.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Pathogenesis and pathophysiology of type I and II diabetes mellitus, diabetic ketoacidosis, nonketotic hyperglycemia.
- Effects of insulin on glucose and fat metabolism.
- Pharmacology of insulin, sulfonylureas, metformin, thiazolidinediones, and glucose absorption inhibitors.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Diagnostic criteria for impaired fasting glucose and impaired glucose tolerance. *(MK)*
2. Diagnostic criteria for type I and type II diabetes mellitus, based on a history, physical examination, and laboratory testing. *(MK)*
3. Pathophysiology, risk factors, and epidemiology of type I and type II diabetes mellitus. *(MK)*
4. The basic principles of the role of genetics in diabetes mellitus. *(MK)*
5. Presenting symptoms and signs of type I and type II diabetes mellitus. *(MK)*
6. Presenting symptoms and signs of diabetic ketoacidosis (DKA) and nonketotic hyperglycemic (NKH). *(MK)*
7. Pathophysiology for the abnormal laboratory values in DKA and NKH including plasma sodium, potassium, and bicarbonate. *(MK)*
8. Precipitants of DKA and NKH. *(MK)*
9. Major causes of morbidity and mortality in diabetes mellitus (coronary artery disease, peripheral vascular disease, hypoglycemia, DKA, NKH coma, retinopathy, neuropathy—peripheral and autonomic, nephropathy, foot disorders, infections). *(MK)*
10. Laboratory tests needed to screen, diagnose, and follow diabetic patients including: glucose, electrolytes, blood urea nitrogen/creatinine, fasting lipid profile, HgA1c, urine microalbumin/creatinine ratio, urine dipstick for protein. *(MK)*
11. Non-pharmacologic and pharmacologic (drugs and side effects) treatment of diabetes mellitus to maintain acceptable levels of glycemic control, prevent target organ disease, and other associated complications. *(MK)*
12. The specific components of the American Diabetes Association (ADA) dietary recommendations for type I and type II diabetes mellitus. *(MK)*
13. Basic management of diabetic ketoacidosis and nonketotic hyperglycemic states, including the similarities and differences in fluid and electrolyte replacement. *(MK)*
14. Basic management of blood glucoses in the hospitalized patient. *(MK)*

15. The Somogyi effect and the Dawn phenomenon and the implications of each in diabetes pharmacologic management. *(MK)*
16. The fundamental aspects of the American Diabetes Association (ADA) clinical practice recommendations and how they encourage high quality diabetes care. *(MK, PLI, SBP)*
17. Basic management of hypertension and hyperlipidemia in the diabetic patient. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - Weight changes. *(PC, CS)*
  - Hypo- or hyperglycemic symptoms. *(PC, CS)*
  - Medication history (adherence, side effects, other medications). *(PC, CS)*
  - Home glucose monitoring results. *(PC, CS)*
  - Target organ disease complications (cardiovascular, foot, gastrointestinal, infectious, neurological, sexual, skin, urinary, or vision symptoms). *(PC, CS)*
  - Diet history (total caloric intake, intake of sugar-containing foods, intake of saturated fat and cholesterol, physical activity level, timing of meals). *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Skin examination for diabetic dermopathy, furuncles/carbuncles, candidiasis, necrobiosis lipoidica diabetorum, dermatophytosis, and acanthosis nigricans. *(PC)*
  - Fundoscopic exam. *(PC)*
  - Arterial pulses. *(PC)*
  - Peripheral nerves (e.g. monofilament testing). *(PC)*
  - Examination of the feet for corns, calluses, and ulcerations. *(PC)*
  - In patients with DKA or NKH evaluate for mental status alterations, Kussmaul's respirations, fruity breath, and signs of volume depletion. *(PC)*
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology for:
  - Hyperglycemia. *(PC, MK)*
  - Hypoglycemia. *(PC, MK)*
  - Anion gap acidosis. *(PC, MK)*
  - Ketosis. *(PC, MK)*
  - Hyperosmolality. *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences Laboratory and diagnostic tests should include, when appropriate:
  - Fasting serum GLC. *(PC, MK)*
  - Electrolytes, BUN/Cr. *(PC, MK)*
  - Serum and urine ketones. *(PC, MK)*
  - Serum and urine osmolality. *(PC, MK)*
  - HbA1c. *(PC, MK)*
  - Fasting lipid profile. *(PC, MK)*
  - UA. *(PC, MK)*
  - Urine microalbumin/creatinine ratio. *(PC, MK)*

- 24-hour urine for protein and creatinine clearance. *(PC, MK)*
5. **Communication skills:** Students should be able to:
    - Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. *(PC, CS)*
    - Elicit questions from the patient and their family about the management plan. *(PC, CS)*
    - Counsel patients appropriately on dietary measures, exercise, medication adherence, proper foot care, and prevention of other target organ disease. *(PC, CS)*
  6. **Basic and advanced procedural skills:** Students should be able to:
    - Finger-stick capillary blood glucose determination. *(PC)*
    - Obtain an ABG. *(PC)*
  7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
    - Writing appropriate fluid and insulin orders and outline critical steps for the treatment of DKA and DKH. *(PC, MK)*
    - Counseling patients regarding basic features of ADA diabetic diet recommendations. *(PC, CS)*
    - Instructing patients in home blood glucose monitoring. *(PC, CS)*
    - Counseling patients on behavior changes (smoking cessation, medication adherence, poor glycemic control, obesity, hypertension, dyslipidemia, and infection) to avoid the complications of diabetes. *(PC, CS)*
    - Counseling patients regarding basic foot care. *(PC, CS)*
    - Determining when to institute diet therapy, oral hypoglycemic agents, and insulin therapy. *(PC, MK)*
    - Calculating an appropriate insulin dose for a diabetic patient. *(PC, MK)*
    - Using community resources (ADA, hospital and community-based education programs) to aid the patient in understanding and managing his or her illness. *(PC, SBP)*
    - Determining when to obtain consultation from an endocrinologist, nephrologist, ophthalmologist, podiatrist, and dietician. *(PC, SBP)*
    - Accessing and utilizing appropriate information systems and resources to help delineate issues related to diabetes mellitus. *(PC, PLI)*
    - Incorporating patient preferences. *(PC)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate a commitment to meeting ADA clinical practice recommendations to insure quality diabetes care. *(PLI, P, SBP)*
2. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for diabetes mellitus. *(PLI, P)*
3. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for diabetes mellitus. *(P)*
4. Respond appropriately to patients who are nonadherent to treatment for diabetes mellitus. *(CS, P)*
5. Demonstrate ongoing commitment to self-directed learning regarding diabetes mellitus. *(PLI, P)*
6. Appreciate the impact diabetes mellitus has on a patient's quality of life, wellbeing, ability to work, and the family. *(P)*
7. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the treatment of diabetes mellitus. *(P, SBP)*

**D. REFERENCES:**

- ⇒ The Diabetes Control and Complication Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med.* 1993;329:977-86.
- ⇒ UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *Lancet.* 1998;352:837-53.
- ⇒ Clinical Practice Recommendations American Diabetes Association  
**[www.diabetes.org/for-health-professionals-and-scientists/cpr.jsp](http://www.diabetes.org/for-health-professionals-and-scientists/cpr.jsp)**
- ⇒ Kitabchi AE. Wall BM. Management of diabetic ketoacidosis. *Am Fam Physician.* 1999;60:455-64.

## TRAINING PROBLEM #21: DYSLIPIDEMIA

### **RATIONALE:**

Dyslipidemia is a common, important, and treatable cardiovascular risk factor. Its pathophysiology is increasingly understood, diagnostic tests are readily available, and treatment modalities range from diet and exercise to a multitude of pharmacotherapies. Competency in the evaluation and management of this problem helps develop skills in rational test selection, patient education, and design of cost-effective treatment strategies. It also draws attention to the importance of community health education and nutrition.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy and physiology of the vascular system.
- Basic cholesterol and lipoprotein metabolism.
- Pathogenesis and pathophysiology of atherosclerosis.
- Pharmacology of bile acid sequestrants (resins), nicotinic acid, fibric acid derivatives, HMG-CoA reductase inhibitors (statins), and cholesterol absorption inhibitors (ezetimibe).

### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

- 1 The contribution of lipoproteins to atherogenesis and CAD risk, including the importance of elevations in total cholesterol, LDL cholesterol, ratio of total to HDL cholesterol, and Lipoprotein a. *(MK)*
- 2 The classification and etiologies of primary dyslipidemias. *(MK)*
- 3 Etiologies and underlying pathophysiology of secondary dyslipidemias. *(MK)*
4. The basic principles of the role of genetics in dyslipidemia, particularly familial combined hyperlipidemia. *(MK)*
5. Screening recommendations for dyslipidemias in American adults. *(MK)*
6. The importance of identifying and treating asymptomatic patients at high risk for CAD as aggressively as those with symptomatic disease. *(MK)*
7. The available diagnostic studies and their use, particularly determinations of HDL, LDL, and total cholesterol, as well as the need to test for other cardiovascular risk factors. *(MK)*
8. The current National Cholesterol Education Program (NCEP, ATP III) guidelines for risk factor assessment, diagnosis and management of dyslipidemias, including goal LDL cholesterol, goal non-HDL cholesterol, and the concept of coronary artery disease equivalent based on risk factors for coronary artery disease. *(MK, PLI, SBP)*
9. Basic management of the common dyslipidemias, including diet, fiber, exercise, and risk/benefits/cost of drug therapy (statins, fibrates, ezetimide, nicotinic acid, resins). *(MK)*
10. Diagnosis and implications of the “metabolic syndrome.” *(MK)*

B. **SKILLS:** Students should be able to demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-



appropriate medical history, that differentiates among etiologies of disease including:

- Prior patient or family history of dyslipidemia. (PC, CS)
- Other coronary risk factors. (PC, CS)
- Family history of early cardiovascular disease. (PC, CS)
- Dietary fat, saturated fat, fiber, cholesterol, and refined carbohydrate intake. (PC, CS)
- Exercise habits. (PC, CS)
- Alcohol use. (PC, CS)
- Past history of established CAD, cerebral vascular disease, and other vascular disease. (PC, CS)
- Presence of symptoms of angina and peripheral vascular disease. (PC, CS)
- History of renal, hepatic, or myopathic disease. (PC, CS)

2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Blood pressure elevation. (PC)
  - Xanthomata. (PC)
  - Atherosclerotic fundoscopic changes. (PC)
  - Carotid or femoral bruits. (PC, CS)
  - Diminished peripheral pulses. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest primary or secondary causes of dyslipidemia. (PC, CS)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.  
Laboratory and diagnostic tests should include, when appropriate:
  - Fasting lipid profile. (PC, MK)
  - TSH (PC, MK)
  - Fasting GLC, electrolytes, BUN/Cr. (PC, MK)
  - Hepatic function panel. (PC, MK)
  - CK. (PC, MK)
5. **Communication skills:** Students should be able to:
  - Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. (PC, CS)
  - Elicit questions from the patient and his or her family about the management plan. (PC, CS)
  - Counsel patients about dietary measures to reduce cholesterol and saturated fats. (PC, CS)
  - Counsel patients about ways to increase exercise. (PC, CS)
  - Counsel patients about other modifiable cardiovascular risk factors. (PC, CS)
6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
  - An individual treatment plan that follows the NCEP ATP III guidelines. (PC, MK)
  - Lifestyle modification (diet, exercise). (PC, MK)
  - Appropriate pharmacologic interventions, including bile acid sequestrants (resins), nicotinic acid, fibric acid derivatives, HMG-CoA reductase inhibitors (statins), and cholesterol absorption inhibitors (ezetimibe). (PC, MK)
  - Monitoring for adherence and side effects due to pharmacologic management. (PC, MK)

- Laboratory response to therapy. (PC, MK)
- Identifying barriers that prevent patients from adhering to recommended dietary, exercise, and pharmacologic plans. (PC, MK)
- Determining when to obtain consultation from an endocrinologist, or dietician. (PC, SBP)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to dyslipidemia. (PC, PLI)
- Incorporating patient preferences. (PC)

C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

- 1 Demonstrate a commitment to meeting NCEP ATP III guidelines to insure quality care of patients with dyslipidemia. (PLI, P, SBP)
- 2 Appreciate the importance of encouraging patients to assume responsibility for modifying their diet and increasing their exercise level. (P, CS)
- 3 Appreciate the difficulties and frustrations that patients and health care providers face with recommended dietary changes. (P)
- 4 Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for dyslipidemia. (PLI, P)
- 5 Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for dyslipidemia. (P)
- 6 Respond appropriately to patients who are nonadherent to treatment for dyslipidemia. (CS, P)
- 7 Demonstrate ongoing commitment to self-directed learning regarding dyslipidemia. (PLI, P)
- 8 Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the treatment of dyslipidemia. (P, SBP)

D. **REFERENCES:**

- ⇒ National Institutes of Health, National Heart, Lung, and Blood Institute National Cholesterol Education Program Clinical Practice Guidelines for Cholesterol Management in Adults (ATP III)  
**[www.nhlbi.nih.gov/about/ncep](http://www.nhlbi.nih.gov/about/ncep)**
- ⇒ Grundy SM, Cleeman JI, Merz CN, et al; National Heart, Lung, and Blood Institute; American College of Cardiology Foundation; American Heart Association. Implications of recent clinical trials for the National Cholesterol Education Program Adult Treatment Panel III guidelines. *Circulation*. 2004;110:227-39.
- ⇒ Ashen MD, Blumenthal RS. Clinical practice. Low HDL cholesterol levels. *N Engl J Med*. 2005;353:1252-60.
- ⇒ Hansson GK. Inflammation, atherosclerosis, and coronary artery disease. *N Engl J Med*. 2005;352:1685-95.

## TRAINING PROBLEM #22: HEART FAILURE

### **RATIONALE:**

Chronic heart failure (HF) is one of the most common cardiac problems encountered in clinical practice. Identification and correction of treatable underlying causes, control of precipitating factors and judicious use of multi-drug regimens for individuals with HF are important issues for third-year medical students.

### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clerkship years should include:

- Knowledge of the structure and function of the heart and lungs.
- Understanding of the epidemiology of heart disease.
- Knowledge of the atherogenesis and pathophysiology of cardiovascular disease.
- Knowledge of the pharmacology of cardiovascular drugs.
- Ability to communicate appropriately with all types of patients including the elderly and those with diverse backgrounds.
- Ability to perform a complete medical history and physical exam.
- Ability to perform a cardiovascular risk assessment and understand issues related to primary and secondary prevention of cardiovascular disease.
- Ability to understand the impact of illness on individuals and their families and, when appropriate, to address issues related to end-of-life care.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Types of processes and most common disease entities that cause HF (i.e. ischemic, valvular, hypertrophic, infiltrative, inflammatory, etc.). *(MK)*
2. The basic role of genetics in certain forms of cardiomyopathy. *(MK)*
3. Staging system for heart failure:
  - Stage A: high risk for HF but no structural heart disease is present. *(MK)*
  - Stage B: structural heart disease is present but never any symptoms. *(MK)*
  - Stage C: past or current symptoms associated with structural heart disease. *(MK)*
  - Stage D: end-stage disease with requirements for specialized treatment. *(MK)*
4. Types of processes that cause systolic vs. diastolic dysfunction. *(MK)*
5. Symptoms and signs of left-sided vs. right-sided heart failure. *(MK)*
6. Compensatory mechanisms of heart failure including cardiac remodeling and activation of endogenous neurohormonal systems. *(MK)*
7. Factors leading to symptomatic exacerbation of HF, including ischemia, arrhythmias, hypoxemia, anemia, fever, hypertension, thyroid disorders, non-compliance with medications and dietary restrictions and use of nonsteroidal anti-inflammatory drugs. *(MK)*
8. Importance of age, gender and ethnicity on the prevalence and prognosis of HF. *(MK)*
9. Physiological basis and scientific evidence supporting each type of treatment, intervention, or procedure commonly used in the management of patients who present with HF. *(MK)*
10. The general approach to the evaluation and treatment of atrial

- fibrillation (*MK*)
11. Role of critical pathways or practice guidelines in delivering high-quality, cost effective care for patients presenting with new or recurrent heart failure. (*PC, SBP*)
12. The Centers for Medicare & Medicaid Services (CMS) and the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) quality measures for HF treatment. (*MK, PLI, SBP*)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, including:
- Differentiating between various etiologies of heart failure (answers the question: Why is the patient in heart failure?). (*PC, CS*)
  - Identifying clinical factors responsible for symptomatic exacerbation (answers the question: Why is the patient worse now?). (*PC, CS*)
  - Exercise intolerance (fatigue, dyspnea on exertion). (*PC, CS*)
  - Fluid retention (peripheral edema, dyspnea). (*PC, CS*)
  - Changes in sleep pattern (orthopnea, paroxysmal nocturnal dyspnea [PND], nocturia). (*PC, CS*)
  - Assessing the functional capacity of patients with HF (walking distance, New York Heart classification). (*PC, CS*)
  - Cardiac risk factors. (*PC, CS*)
2. **Physical exam skills:** Students should be able to perform a focused physical exam to help establish the diagnosis of HF and estimate its severity:
- Measurement of vital signs including weight and respiratory rate/pattern. (*PC*)
  - Accurate measurement of arterial blood pressure and recognition of the typical blood pressure findings that occur in patients with aortic stenosis, aortic insufficiency and pulsus paradoxus. (*PC*)
  - Assessment of major arterial pulses for abnormalities, including bruits. (*PC*)
  - Assessment of the neck veins for jugular venous distention and, when necessary, evaluation for abdominal jugular reflux. (*PC*)
  - Assessment of the conjunctiva and optic fundus. (*PC*)
  - Assessment of the extremities to ascertain for skin conditions, including color, temperature and the presence of edema, cyanosis or clubbing. (*PC*)
  - Assessment of the lungs for crackles, rhonchi and decreased breath sounds. (*PC*)
  - Inspection and palpation of the anterior chest to identify right and left sided heaves, lifts and thrills. (*PC*)
  - Auscultation of the heart to determine rhythm, intensity of heart sounds, splitting of S2 and the presence of rubs, gallops (S3, S4, summation) or extra heart sounds (e.g. clicks). (*PC*)
  - Auscultation of the heart to detect the presence of heart murmurs; when a murmur is present, students should be able to:
    - Identify timing (systolic vs. diastolic, holosystolic vs. ejection). (*PC*)
    - Describe pitch, location and pattern of radiation. (*PC*)
    - Gauge significance (innocent vs. pathologic, sclerosis vs. stenosis). (*PC*)
  - Assessment of the abdomen to determine the presence of hepatomegaly, ascites, abnormal pulsations and bruits. (*PC*)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential

diagnosis and recognize specific history, physical exam and/or laboratory findings that:

- Help support or refute a clinical diagnosis of heart failure. (PC, MK)
- Distinguish between various underlying etiologies of HF, including disease processes that primarily affect:
  - Pericardium (constrictive pericarditis, pericardial tamponade). (PC, MK)
  - Endocardium (valvular [congenital, acquired], endocarditis). (PC, MK)
  - Myocardium (hypertrophic, restrictive, congestive). (PC, MK)

4. **Laboratory interpretation:** Students should be able to interpret specific diagnostic tests and procedures that are commonly ordered to evaluate patients who present with heart failure. Test interpretation should take into account: Laboratory and diagnostic tests should include, when appropriate:

- 12-lead ECG. (PC, MK)
- Chest radiograph. (PC, MK)
- B-type natriuretic peptide. (PC, MK)

Students should be able to define the indications for, and interpret (**with consultation**) the results of the following diagnostic tests and procedures:

- Echocardiography. (PC, MK)
- Treadmill and nuclear exercise testing. (PC, MK)
- Radionuclide ventriculogram. (PC, MK)
- Cardiac. (PC, MK)
- Coronary angiography. (PC, MK)

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, prognosis and treatment plan to the patient and his or her family. (PC, CS)
- Elicit questions from the patient and his or her family about the management plan. (PC, CS)
- Educate patients about cardiovascular risk factors. (PC, CS)
- Counsel patients regarding a sodium-restricted diet. (PC, CS)
- Address palliative care and end-of-life issues with patients who have
- intractable symptoms associated with end-stage heart failure. (PC, CS, P)

6. **Basic and advanced procedural skills:** students should be able to:

- Perform a 12-lead ECG. (PC)
- Obtain an ABG. (PC)

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Recognize the importance of early detection and treatment of risk factors that may lead to the development of heart failure. (PC)
- Identifying the indications, contraindications, mechanisms of action, adverse reactions, significant interactions, and relative costs of the following treatments/interventions:
  - Non-pharmacological management. (PC, MK)
    - Sodium restriction. (PC, MK)
    - Physical activity and limitations. (PC, MK)
  - Pharmacological management (recommended for routine use). (PC, MK)
    - Diuretics. (PC, MK)
    - ACE-I/ARB. (PC, MK)
      - Beta-blockers. (PC, MK)
      - Aldosterone antagonists (spironolactone, eplerenone). (PC, MK)
      - digoxin. (PC, MK)
    - Interventions considered for use in selected patients. (PC, MK)
      - Hydralazine and isosorbide dinitrate. (PC, MK)

- Angiotensin receptor blockers. *(PC, MK)*
- Calcium channel blockers. *(PC, MK)*
- Anti-arrhythmic agents. *(PC, MK)*
- Anticoagulants/anti a thrombotic agents. *(PC, MK)*
- other modalities*(PC, MK)*
- Coronary revascularization. *(PC, MK)*
- Synchronized biventricular pacing. *(PC, MK)*
- Implantable cardiac defibrillators. *(PC, MK)*
- Developing a timely and appropriate evaluation and treatment plan for patients with heart failure due to diastolic dysfunction, including:
  - Control of physiologic factors (blood pressure, heart rate). *(PC, MK)*
  - Reduction in central blood volume by judicious use of diuretics. *(PC, MK)*
  - Alleviation of myocardial ischemia. *(PC, MK)*
  - Use of calcium channel blockers. *(PC, MK)*
- Describing use of other agents and interventions that may be useful in treating patients with refractory, end-stage heart failure:
  - Intravenous vasodilators. *(PC, MK)*
  - Intravenous positive inotropic agents. *(PC, MK)*
  - Infusion of B-type natriuretic peptide (nesiritide). *(PC, MK)*
  - Ventricular assist devices. *(PC, MK)*
  - Heart transplantation. *(PC, MK)*
- Defining and describing how the diagnosis and treatment of HF in special populations may differ (e.g. very elderly, associated co-morbidities). *(PC, MK)*
- Demonstrating how critical pathways or practice guidelines in ambulatory or hospitalized patients with HF can be used to guide diagnostic test ordering and medical decision making. *(PC, PLI, SBP)*
- Determining when to consult a cardiologist. *(PC, SBP)*
- Identifying when palliative care may be appropriate for patients with refractory symptoms associated with end-stage disease. *(PC)*
- Using a cost-effective approach based on the differential diagnosis. *(PC, SBP)*
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to HF. *(PC, PLI)*
- Incorporating patient preferences. *(PC)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for HF. *(PLI, P)*
2. Recognize the significant morbidity and mortality associated with HF *(P)*
3. Recognize the impact of lifestyle limitations caused by HF. *(P)*
4. Respond appropriately to patients who are non-adherent to treatment for HF. *(CS, P)*
  
5. Demonstrate ongoing commitment to self-directed learning regarding heart failure. *(PLI, P)*
6. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of heart failure. *(P, SBP)*
7. Appreciate the importance of and demonstrate a commitment to meeting national health care quality measures for the treatment of HF. *(PLI, P, SBP)*

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## TRAINING PROBLEM #23: HIV INFECTION

### **RATIONALE:**

HIV infection and AIDS represent one of the most difficult challenges in clinical medicine today. An HIV specialist (usually an infectious diseases physician) cares for the vast majority of patients with HIV infection and AIDS. Given that there is no proven cure, this remains an important training problem for third year medical students. The enormous and continuously evolving complexities of antiretroviral treatment are generally beyond the level of the third year medical student and for that matter most general internists. Rather, an approach to HIV infection, AIDS, and its most common and serious complications are stressed.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of the worldwide epidemiology, biology, and immunology of HIV.
- Microbiology of common opportunistic organisms.
- Pharmacology of antimicrobial agents and antiretrovirals.
- Understanding of universal precautions.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Symptoms and signs of acute HIV seroconversion. (MK)
2. CDC AIDS case definition. (MK)
3. Specific tests for HIV (e.g. HIV ELISA, confirmatory western blot, quantitative PCR) and their operating characteristics. (MK)
4. Relationship of CD4 lymphocyte count to opportunistic infections as well as relationship between CD4 lymphocyte count and viral load to overall disease progression. (MK)
5. The basic principles of highly active antiretroviral therapy (HAART), including the different classes of antiviral medications and their use, as well as common side effects and drug-drug interactions. (MK)
6. Basics of post-exposure prophylaxis. (MK)
7. The marked importance of antiretroviral medication adherence and the potential consequences of erratic or poor adherence. (MK)
8. Vaccination recommendation for patients infected with HIV. (MK)
9. Indications for and utility and risks of prophylaxis of HIV-related opportunistic infections. (MK)
10. Pathogenesis, symptoms, signs, typical clinical course, and management of HIV-related opportunistic infections with a recognition of which are most common:
  - *Pneumocystis jiroveci*. (MK)
  - Candidiasis (oral, esophageal, vaginal). (MK)
  - *Cryptococcus neoformans*. (MK)
  - *Cryptosporidium parvum*. (MK)
  - Cytomegalovirus infection (gastrointestinal, neurologic, retinal). (MK)
  - Varicella-zoster virus. (MK)
  - *Isospora belli*. (MK)



- Microsporidiosis. (MK)
  - *Mycobacterium avium complex*. (MK)
  - *Mycobacterium tuberculosis*. (MK)
  - *Toxoplasma gondii*. (MK)
11. Symptoms and signs of the following HIV-related malignancies:
- Kaposi's sarcoma. (MK)
  - Non-Hodgkin's lymphoma. (MK)
  - Cervical carcinoma. (MK)
12. Common skin and oral manifestations of HIV infection and AIDS:
- Molluscum contagiosum. (MK)
  - *Cryptococcus neoformans*. (MK)
  - Viral warts. (MK)
  - Lipodystrophy. (MK)
  - Herpes zoster. (MK)
  - Seborrheic dermatitis. (MK)
  - Buccal candidiasis. (MK)
  - Oral hairy leukoplakia. (MK)
13. "Safe sex" practices (MK)
14. The importance of proper ongoing dental care. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
  - HIV infection risk factors. (PC, CS)
  - Sexual contacts. (PC, CS)
  - Parenteral exposure to infected blood by needle sharing or transfusion. (PC, CS)
  - Occupational exposures. (PC, CS)
  - Other sexually transmitted diseases. (PC, CS)
  - Tuberculosis exposure. (PC, CS)
  - Prior HIV serology results, CD4 lymphocyte count and viral load. (PC, CS)
  - Prior HIV-related opportunistic infections. (PC, CS)
  - Current/prior antiretroviral medications and their side effects. (PC, CS)
  - Fever, sweats, anorexia, unintentional weight loss, rash/skin lesions, lymphadenopathy. (PC, CS)
  - Cough, sputum production, dyspnea, chest pain. (PC, CS)
  - Headache, altered mental status, psychiatric complaints. (PC, CS)
  - Odynophagia, dysphagia. (PC, CS)
  - Vaginal discharge, history of cervical dysplasia or neoplasia. (PC, CS)
  - Diarrhea. (PC, CS)
  - Visual changes. (PC, CS)
  - A dietary history to determine caloric intake. (PC, CS)
  
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - General appearance regarding atrophy/wasting/cachexia. (PC)
  - Complete neurologic examination. (PC)

- Mental status examination. (PC)
  - Fundoscopic examination. (PC)
  - Lymph node examination. (PC)
  - Skin and oral examination. (PC)
  - Pelvic and male genital examination. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology in an potentially or known HIV-infected patient for the following:
- Fever. (PC, MK)
  - Unintentional weight loss/wasting/cachexia. (PC, MK)
  - Lymphadenopathy. (PC, MK)
  - Rash and skin lesions. (PC, MK)
  - Cough, sputum production, dyspnea, abnormal chest radiography. (PC, MK)
  - Diarrhea, odynophagia, dysphagia. (PC, MK)
  - Altered mental status and psychiatric changes. (PC, MK)
  - Headache. (PC, MK)
  - Oral lesions. (PC, MK)
  - Visual/retinal abnormalities. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.
- Laboratory and diagnostic tests should include, when appropriate:
- Specific tests for HIV (e.g. HIV ELISA, confirmatory western blot, quantitative PCR). (PC, MK)
  - CD4 lymphocyte count. (PC, MK)
  - CBC with differential. (PC, MK)
  - Sputum staining and cultures. (PC, MK)
  - Blood cultures. (PC, MK)
  - Cerebrospinal fluid analysis (color, opening pressure, chemistries, cell counts, staining, cultures, cytology, cryptococcal antigen, VDRL,
  - Epstein Barr virus, cytomegalovirus, toxoplasmosis, JC virus). (PC, MK)
  - Stool for ova and parasites, cryptosporium, isospora, microsporidia, cytomegalovirus antigen. (PC, MK)
  - Chest radiograph. (PC, MK)
- Students should be able to define the indications for and interpret (**with consultation**) the results of:
- Chest CT. (PC, MK)
  - Cranial CT. (PC, MK)
  - Cranial MRI. (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
  - Elicit input and questions from the patient and his or her family about the management plan. (PC, CS)
  - counsel and educate patients about HIV exposure prevention (PC, CS)
  - Counsel an exposed patient about seroconversion rates and, in appropriate situations, the availability of post-exposure prophylaxis. (PC, CS)

- Counsel and educate patients about complications of HIV drug therapy, drug-drug interactions, and the marked importance of adherence. *(PC, CS)*
6. **Basic and advanced procedural skills:** Students should be able to:
- Obtain blood cultures. *(PC)*
  - Obtain an ABG. *(PC)*
  - Place and interpret a PPD. *(PC)*
  - Assist in performing a lumbar puncture after explaining the procedure to the patient. *(PC)*
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Ordering appropriate laboratory tests. *(PC, MK)*
  - Advising patients regarding HIV transmission prevention. *(PC, MK)*
  - Insuring antiretroviral adherence. *(PC, MK)*
  - Following parameters of disease progression/activity. (e.g. CD4 lymphocyte count, viral load). *(PC, MK)*
  - Monitoring for the development of side effects from antiretroviral treatment and drug-drug interactions. *(PC, MK)*
  - Insuring the administration of appropriate vaccinations. *(PC, MK)*
  - Assessing PPD status. *(PC, MK)*
  - Prescribing and monitoring appropriate opportunist infection prophylaxis. *(PC, MK)*
  - Ordering nutritional supplements to manage and prevent malnutrition. *(PC, MK)*
  - Assisting in the procurement of proper and ongoing dental care. *(PC, MK)*
  - Identifying and recommending community health care resources available for the care of AIDS patients. *(PC, SBP)*
  - Determining when to obtain consultation from an infectious diseases specialist. *(PC, SBP)*
  - Using a cost-effective approach based on the differential diagnosis. *(PC, SBP)*
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to HIV infection and AIDS. *(PC, PLI)*
  - Incorporating patient need and preferences. *(PC)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Appreciate the bioethical, social, and legal issues concerning patient confidentiality of HIV infection. *(PC, CS)*
2. Demonstrate a nonjudgmental attitude regarding the mode of HIV acquisition. *(P)*
3. Appreciate the sometimes severe social stigma of HIV infection and AIDS. *(P)*
4. Show respect of “alternative lifestyles.” *(P)*
5. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for HIV infection and AIDS. *(PLI, P)*
6. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for patients with HIV infection or AIDS. *(P)*
7. Respond appropriately to patients who are nonadherent to antiretroviral treatment. *(CS, P)*
8. Demonstrate ongoing commitment to self-directed learning regarding HIV infection and AIDS. *(PLI, P)*
9. Appreciate the impact HIV infection and AIDS have on a patient’s quality of life, well-being, ability to work, and the family. *(P)*
10. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in the diagnosis and treatment of HIV infection and AIDS. *(P, SBP)*

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## TRAINING PROBLEM #24: HYPERTENSION

### **RATIONALE:**

As many as 50 million Americans have elevated blood pressure (systolic pressure 140 mmHg or greater and/or diastolic blood pressure 90 mmHg or greater) or are taking antihypertensive medication. Nonfatal and fatal cardiovascular disease (CVD)— including coronary heart disease (CHD), peripheral vascular disease, stroke and renal disease—all increase progressively with higher levels of both systolic (SBP) and diastolic (DBP) blood pressure levels. These relationships are strong, continuous, independent, predictive and etiologically significant, and indicate that reduction of blood pressure reduces these risks.

### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clinical years should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of the pathogenesis and pathophysiology of hypertension.
- Knowledge of the epidemiology and risk factors for hypertension.
- Understanding of the pharmacologic management of acute and chronic hypertension.
- Understanding the behavioral issues by sex, race, culture, and age that relate to the management and treatment of hypertension.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe and discuss:

1. The etiologies and relative prevalence of primary and secondary hypertension. *(MK)*
2. The basic principles of the role of genetics in hypertension. *(MK)*
3. The definition of hypertensive urgency and emergency, citing examples of both. *(MK)*
4. The difference between essential (primary) and secondary hypertension. *(MK)*
5. Symptoms and signs of the following disorders associated with secondary hypertension:
  - Renovascular hypertension. *(MK)*
  - Renal failure. *(MK)*
  - Polycystic kidney disease. *(MK)*
  - Cushing's disease or syndrome. *(MK)*
  - Hyperaldosteronism. *(MK)*
  - Hyperthyroidism. *(MK)*
  - Hypercalcemia. *(MK)*
  - Medication, alcohol, and illicit drug use. *(MK)*
  - Coarctation of the aorta. *(MK)*
  - Sleep apnea. *(MK)*
6. The manifestations of target-organ disease due to hypertension. *(MK)*
7. Classification of blood pressure (SBP and DBP for all age 18 or older). *(MK)*
8. Basic approaches to the pharmacological management of acute and chronic hypertension, including the physiologic basis and scientific evidence supporting these approaches, and causes for lack of responsiveness to therapy. *(MK)*
9. Prevention strategies for reducing hypertension (including lifestyle factors, such as dietary intake of sodium, weight, and exercise level), and explain the physiologic basis and/or

- scientific evidence supporting each strategy. (MK)
10. Steps in management of patients with a hypertensive emergency. (MK)
  11. Factors that contribute to non-adherence with antihypertensive medications. (MK)

**B. SKILLS:** Students should demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
  - Duration and levels of elevated blood pressure. (PC, CS)
  - History of symptoms of cardiovascular, cerebrovascular, peripheral vascular or renal disease; diabetes; dyslipidemia; or gout. (PC, CS)
  - History of symptoms suggesting secondary hypertension. (PC, CS)
  - History of weight gain, leisure-time physical activities, and smoking or other tobacco use. (PC, CS)
  - Family history of high blood pressure, premature CHD, stroke, CVD, diabetes mellitus and dyslipidemia. (PC, CS)
  - Psychosocial and environmental factors that may elevate blood pressure (family situation, employment status, working conditions, education level). (PC, CS)
  - Dietary assessment, including sodium intake and intake of saturated fat and cholesterol. (PC, CS)
  - Results and side effects of previous antihypertensive therapy. (PC, CS)
  - Use of commonly prescribed, over-the-counter, and illicit medications that may raise blood pressure or interfere with the effectiveness of antihypertensive medications. (PC, CS)
  - Alcohol intake. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Blood pressure measurements to detect and confirm the presence of high blood pressure. (PC)
  - Examination of the fundus for arteriolar narrowing, arteriovenous nicking, hemorrhages, exudates, or papilledema. (PC)
  - Neck for carotid bruits, distended veins, or an enlarged thyroid gland. ((PC)
  - Heart for increased rate, increased size, precordial heave, clicks, murmurs, arrhythmias, and third (S3) and fourth (S4) sounds. (PC)
  - Abdomen for bruits, enlarged kidneys, masses, and abnormal aortic pulsation. (PC)
  - Extremities for diminished, delayed, or absent peripheral arterial pulsations, bruits, and edema. (PC)
  - Peripheral pulses specifically femoral arterial pulses. (PC)
  - Body habitus, looking for changes associated with secondary hypertension. (PC)
  - Peripheral and central nervous system for ischemic changes. (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history, physical exam, and laboratory findings that suggest a specific etiology of hypertension. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend and interpret diagnostic and laboratory tests, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
  - UA. (PC, MK)
  - CBC. (PC, MK)
  - Blood glucose (fasting if possible). (PC, MK)

- Electrolytes, BUN/Cr. (PC, MK)
  - Uric acid. (PC, MK)
  - Fasting lipid profile. (PC, MK)
  - ECG. (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan and prognosis of the disease to the patient and his or her family, taking into account the patient's knowledge of hypertension and his or her preferences regarding treatment options. (PC, CS)
  - Elicit questions from the patient and his or her family about the management plan. (PC, CS)
  - Educate patients about hypertension risk factors, taking into account:
    - Demographics. (PC, CS)
    - Concomitant diseases and therapies. (PC, CS)
    - Quality of life. (PC, CS)
    - Physiologic and biochemical measurements. (PC, CS)
    - Economic considerations. (PC, CS)
6. **Basic and advanced procedural skills:** Students should be able to perform:
- UA (dipstick and microscopic). (PC)
  - 12-lead ECG. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Treating acute and chronic hypertension. (PC, MK)
  - Treating primary (essential) hypertension versus secondary hypertension. (PC, MK)
  - Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
  - Prescribing preventative strategies to diminish hypertension, including:
    - Weight reduction. (PC, MK)
    - Moderation of alcohol intake. (PC, MK)
    - Regular physical activity. (PC, MK)
    - Reduction of sodium intake. (PC, MK)
    - Increase in potassium intake. (PC, MK)
    - Smoking cessation. (PC, MK)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to hypertension. (PC, PLI)
  - Incorporating patient preferences. (PC)
- C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:
1. Appreciate the importance of patient preferences and adherence with management plans for those with hypertension. (P)
  2. Recognize the responsibility of the physician with regard to non-adherence. (P)
  3. Respond appropriately to patients who are non-adherent to treatment for hypertension. (CS, P)
  4. Appreciate how preventative strategies may diminish need for medications. (P)
  5. Appreciate the importance of side effects of medications and their impact on quality of life and adherence (including those side effects to which the geriatric population may be more prone) and demonstrate a commitment to limiting the whenever possible. (P)
  6. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for hypertension. (PLI, P)
  7. Demonstrate ongoing commitment to self-directed learning regarding hypertension. (PLI, P)
  8. Appreciate the impact hypertension has on a patient's quality of life, wellbeing, ability to work,

and the family. (P)

9. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of hypertension. (P, SBP)

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1003.

## TRAINING PROBLEM #25: LIVER DISEASE

### **RATIONALE:**

The causes of hepatobiliary disease are many and can be quite overwhelming to the internal medicine clerk. A thorough understanding of a systematic approach to hyperbilirubinemia/jaundice is by far preferable to random knowledge of highly specific etiologies. The liver responds pathologically to injury in characteristic ways and knowledge of these patterns can also be very useful in differential diagnosis. Several etiologies of liver disease such as acute/chronic viral hepatitis and alcohol-induced liver disease are sufficiently common as to require specific attention. In addition, many liver diseases can result in cirrhosis and its complications and, therefore, understanding this end-stage development is important.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy, physiology, and pathophysiology of the hepatobiliary system.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The biochemical/physiologic/mechanistic approach to hyperbilirubinemia, including:
  - Increased production. *(MK)*
  - Decreased hepatocyte uptake. *(MK)*
  - Decreased conjugation. *(MK)*
  - Decreased excretion from the hepatocyte. *(MK)*
  - Decreased small duct transport (intrahepatic cholestasis). *(MK)*
  - Decreased large duct transport (extrahepatic cholestasis, obstructive jaundice). *(MK)*
2. The biochemistry and common causes of unconjugated and conjugated hyperbilirubinemia. *(MK)*
3. The use of serum markers of liver injury (e.g. AST, ALT, GGT, Alk Phos) and function (e.g. bilirubin, ALB, PT/INR) in the diagnostic evaluation of hepatobiliary disease. *(MK)*
4. The clinical significance of asymptomatic, isolated elevation of AST, ALT, GGT, and/or Alk Phos. *(MK)*
5. The common pathologic patterns of liver disease and their common causes, including:
  - Steatosis (fatty liver). *(MK)*
  - Hepatitis. *(MK)*
  - Cirrhosis. *(MK)*
  - Infiltrative. *(MK)*
  - Intrahepatic cholestasis. *(MK)*
  - Extrahepatic cholestasis (obstructive jaundice). *(MK)*
6. The epidemiology, symptoms, signs, typical clinical course, and prevention of viral hepatitis. *(MK)*
7. The distinctions between acute and chronic hepatitis. *(MK)*
8. The indications for and efficacy of hepatitis A and B vaccinations. *(MK)*
9. The common causes and clinical significance of hepatic steatosis and steatohepatitis. *(MK)*

10. The epidemiology, symptoms, signs, and typical clinical course of autoimmune liver diseases such as autoimmune hepatitis, primary biliary cirrhosis, and primary sclerosing cholangitis. *(MK)*
11. The epidemiology, symptoms, signs, and typical clinical course of cirrhosis. *(MK)*
12. The pathophysiologic manifestations, symptoms, signs, and complications of alcohol-induced liver disease. *(MK)*
13. The symptoms, signs, and complications of portal hypertension. *(MK)*
14. The pathophysiology and common causes of ascites. *(MK)*
15. The pathophysiologic manifestations, symptoms, and signs of spontaneous bacterial peritonitis. *(MK)*
16. The basic pathophysiology, symptoms, signs, typical clinical course, and precipitants of hepatic encephalopathy. *(MK)*
17. The basic pathophysiology, symptoms, signs, and typical clinical course of the hepatorenal syndrome. *(MK)*
18. The analysis of ascitic fluid and its use in the diagnostic evaluation of liver disease. *(MK)*
19. Common causes of drug-induced liver injury. *(MK)*
20. Genetic considerations in liver disease (i.e. hemochromatosis, Wilson's disease, alpha-1 antitrypsin deficiency, Gilbert's syndrome). *(MK)*
21. The epidemiology, pathophysiology, symptoms, signs, and typical clinical course of cholelithiasis and cholecystitis. *(MK)*
22. The clinical syndrome of "ascending cholangitis" including its common causes and typical clinical course. *(MK)*
23. The indications for and risks of paracentesis and liver biopsy. *(MK)*
24. The indications for and utility of hepatobiliary imaging studies, including:
  - Ultrasound. *(MK)*
  - Nuclear medicine studies. *(MK)*
  - CT. *(MK)*
  - MRI. *(MK)*
  - Magnetic resonance cholangiopancreatography (MRCP). *(MK)*
  - Endoscopic retrograde cholangiopancreatography (ERCP). *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - Jaundice, discolored urine, pruritis, light-colored stool, unintentional weight loss, fever, nausea, emesis, diarrhea, altered mental status, abdominal pain, increased abdominal girth, edema, rectal bleeding, hematemesis. *(PC, CS)*
  - DM. *(PC, CS)*
  - Alcohol use. *(PC, CS)*
  - Prescription, over-the-counter, and illicit drug use. *(PC, CS)*
  - Transfusions and other sources of potential blood-borne pathogen exposure. *(PC, CS)*
  - Consumption of uncooked shellfish and other food items potentially contaminated with fecal matter. *(PC, CS)*
  - Sexual history. *(PC, CS)*
  - Vaccination history. *(PC, CS)*
  - Family history of liver diseases. *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the

diagnosis and severity of disease, including:

- Jaundice. (PC)
  - Complete abdominal examination including findings consistent with ascites (e.g. bulging flanks, shifting dullness, fluid wave). (PC)
  - Findings compatible with chronic alcohol use and portal hypertension (e.g. palmar erythema, spider angiomas, gynecomastia, testicular atrophy, Dupuytren's contracture, muscle wasting, splenomegaly, ascites, edema, caput medusa, hemorrhoids). (PC)
  - Findings compatible with hepatic (portosystemic) encephalopathy (e.g. disturbances of consciousness and behavior, fluctuating neurologic signs, asterixis). (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology of liver disease. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
- CBC. (PC, MK)
  - Electrolytes, BUN/Cr, GLC. (PC, MK)
  - ALB, TP, total bilirubin, direct bilirubin, PT/INR, AST, ALT, Alk Phos. (PC, MK)
  - Hepatitis serology. (PC, MK)
  - Ascitic fluid ALB, amylase, cell counts, staining, cultures, and the
  - serum-ascites albumin gradient (SAAG). (PC, MK)
- Students should be able to define the indications for and interpret (**with consultation**) the results of:
- Ultrasound. (PC, MK)
  - Nuclear medicine studies. (PC, MK)
  - CT. (PC, MK)
  - MRI. (PC, MK)
  - Magnetic resonance cholangiopancreatography (MRCP). (PC, MK)
  - Endoscopic retrograde cholangiopancreatography (ERCP). (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
  - Elicit input and questions from the patient and his or her family about the management plan. (PC, CS)
  - Discuss the avoidance of known hepatotoxins. (PC, CS)
  - Counsel patients regarding alcohol abstinence. (PC, CS)
  - Discuss the importance of hepatitis A and B vaccinations for nonimmune patients. (PC, CS)
6. **Basic and advanced procedural skills:** Students should be able to:
- Assist in performing a paracentesis after explaining the procedure to the patient. (PC)
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- The diagnostic evaluation of asymptomatic, isolated elevation of the transaminases and/or Alk Phos. (PC, MK)
  - The diagnostic evaluation of patients with jaundice and unconjugated or conjugated hyperbilirubinemia. (PC, MK)
  - The basic management of steatosis, hepatitis, cirrhosis, intra- and extra hepatic cholestasis, acute cholecystitis, ascites, portal hypertension, spontaneous bacterial

peritonitis, and hepatic encephalopathy. (PC, MK)

- Determining when to obtain consultation from a gastroenterologist, hepatologist, or biliary surgeon. (PC, SBP)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to liver disease. (PC, PLI)
- Incorporating patient preferences. (PC)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for liver disease. (PLI, P)
2. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for liver disease. (P)
3. Respond appropriately to patients who are nonadherent to treatment for liver disease. (CS, P)
4. Demonstrate ongoing commitment to self-directed learning regarding liver disease. (PLI, P)
5. Appreciate the impact liver disease has on a patient's quality of life, wellbeing, ability to work, and the family. (P)
6. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the diagnosis and treatment of liver disease. (P, SBP)
7. Discuss the public health role physicians play in the prevention of viral hepatitis. (P, SBP)
8. Appreciate the difficulties patient face with alcohol abstinence. (P)

**D. REFERENCES:**

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National Center for Infectious Diseases  
Center for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/ncidod/diseases/hepatits/index.htm](http://www.cdc.gov/ncidod/diseases/hepatits/index.htm)**
- ⇒ Practice Guidelines  
American Association for the Study of Liver Diseases  
**[www.aasld.org](http://www.aasld.org)**
- ⇒ National Institute on Alcohol Abuse and Alcoholism  
National Institutes of Health  
U.S. Department of Health and Human Services  
**[www.niaaa.nih.gov](http://www.niaaa.nih.gov)**
- ⇒ Pratt DS, Kaplan MM. Evaluation of abnormal liver-enzyme results in asymptomatic patients. *N Engl J Med.* 2000;342:1266-71.
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## TRAINING PROBLEM #26: MAJOR DEPRESSION

### **RATIONALE:**

Major depression is a very common problem in adults, resulting in significant morbidity and mortality. Most often the primary care provider is the first health care professional to see a depressed patient. Frequently, the initial presentation is associated with somatic complaints that bring the patient to the physician. Major depression is also a relatively common accompaniment to serious medical conditions. There is significant evidence that primary care physicians commonly fail to diagnose major depression. With relatively recent improvements in available treatment, it is even more important for internists to screen for major depression and to know the common presenting symptoms. The internist should also be familiar with available therapeutic options and be prepared to treat selected patients, including those who decline consultation with a mental health professional.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Neurochemistry of major depression.
- Pharmacology of the major classes of antidepressants.
- Basic understanding of the efficacy of psychotherapy, antidepressants, and electroconvulsive therapy.

### **SPECIFIC LEARNING OBJECTIVES:**

- A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:
1. The epidemiology of major depression in the general population and the impact of major illness on the prevalence of major depression (e.g. stroke, heart disease, DM, cancer, Parkinson's disease, HIV/AIDS). *(MK)*
  2. The impact of major depression on the outcome of medical illness. *(MK)*
  3. The American Psychiatric Association's Diagnostic and Statistical Manual 4<sup>th</sup> edition (DSM-IV) diagnostic criteria for major depression. *(MK)*
  4. Common psychological symptoms and signs of major depression (e.g. low mood/affect, anxiety, irritability/anger, disinterest, anhedonia, decreased libido, guilt, poor self-esteem, poor concentration, rumination, helplessness, hopelessness, thoughts of death and suicide, somatic complaints). *(MK)*
  5. Common neurovegetative symptoms and signs of major depression (e.g. appetite disturbance, decreased energy, psychomotor retardation or agitation, sleep disturbance). *(MK)*
  6. Common somatic complaints that accompany depressive disorders and the potential for the occurrence of these symptoms without obvious psychological symptoms (e.g. fatigue, weakness, myalgias, arthralgias, headache, nausea, dyspnea, palpitations, chest pain/discomfort, lightheadedness/dizziness, bowel movement alterations). *(MK)*
  7. The distinguishing features of major depression with psychotic features, bipolar disorder, dementia, and delirium. *(MK)*
  8. The differential diagnosis of major depression, including:
    - Other psychiatric disorders. *(MK)*
    - Drug-induced (e.g. corticosteroids, cimetidine, metoclopramide, clonidine, etc.). *(MK)*

- Drug withdrawal (e.g. amphetamine, cocaine). (MK)
  - Infection (e.g. tertiary syphilis). (MK)
  - Endocrine/metabolic (e.g. hypo/hyperthyroidism, Cushing's, Addison's). (MK)
  - Collagen vascular diseases (e.g. lupus, fibromyalgia). (MK)
  - Neurologic (e.g. stroke, multiple sclerosis, Parkinson's disease, head trauma, complex partial seizures). (MK)
  - Nutritional (e.g. B12, folate, niacin, thiamine deficiencies). (MK)
  - Neoplastic (e.g. pancreatic cancer, disseminated carcinomatosis). (MK)
9. US Preventive Services Task Force (USPSTF) depression screening recommendations. (MK)
  10. The risks of untreated major depression. (MK)
  11. Assessment of the risk of suicide. (MK)
  12. The demographics and risk factors for completed suicide. (MK)
  13. The potential link between major depression and substance abuse. (MK)
  14. The potential role of genetics in depression. (MK)
  15. Indications and efficacy of the basic therapeutic options for major depression, including:
    - Psychotherapy (cognitive behavioral therapy or interpersonal psychotherapy). (MK)
    - Pharmacotherapy. (MK)
    - Electroconvulsive therapy. (MK)
  16. The side effects of the major classes of antidepressants and common interaction with other medications. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease including:
  - Eliciting the symptoms of major depression. (PC, CS)
  - Determining the presence or absence of underlying dementia, anxiety disorders, adverse drug effects, and grief in any patient suspected of having major depression. (PC, CS)
  - Obtaining a complete drug history (including illicit drugs). (PC, CS)
  - Identifying chronic diseases that are associated with increased risk of major depression. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - A complete neurologic examination. (PC)
  - A complete mental status exam. (PC)
5. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology for major depression (psychiatric and nonpsychiatric). (PC, MK)
6. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.  
Laboratory and diagnostic tests should include, when appropriate:
  - Blood and urine drug screening. (PC, MK)
  - Thyroid function tests. (PC, MK)
  - Serum RPR and VDRL. (PC, MK)
  - B12, folate, and thiamine levels. (PC, MK)

Students should be able to define the indications for and interpret (**with consultation**) the results of:

- Cranial CT. *(PC, MK)*
  - Cranial MRI. *(PC, MK)*
7. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. *(PC, CS)*
  - Elicit input and questions from the patient and his or her family about the management plan. *(PC, CS)*
  - Demonstrate effective listening skills and empathy. *(PC, CS)*
  - Advise the patient of the delay in therapeutic benefit from antidepressant medications. *(PC, CS)*
6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- An appreciation of the fact that major depression is not generally a “diagnosis of exclusion” and that ruling out all other possible medical causes is typically not necessary. *(PC, MK)*
  - Making an accurate diagnosis of major depression. *(PC, MK)*
  - Assessing for the risk of suicide. *(PC, MK)*
  - Recommending psychotherapy (cognitive behavioral therapy or interpersonal psychotherapy). *(PC, MK)*
  - Selecting appropriate initial pharmacologic therapy considering efficacy, side effects, and potential drug-drug interactions. *(PC, MK, SBP)*
  - Identifying barriers to major depression treatment. *(PC, SBP)*
  - Anticipating potential resistance to seeing a psychiatrist and antidepressant treatment. *(PC)*
  - Planning appropriate follow-up. *(PC, MK)*
  - Recognizing success or failure of initial treatment and making appropriate adjustments. *(PC, MK)*
  - Determining when to obtain consultation from a psychiatrist, psychologist, or other mental health professional. *(PC, SBP)*
  - Using a cost-effective approach to treatment. *(PC, SBP)*
  - Accessing and utilizing appropriate information systems and resources to help delineate issues related to major depression. *(PC, PLI)*
  - Incorporating patient needs and preferences. *(PC)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Recognize major depression as an important and potentially life-threatening disease. *(P)*
2. Appreciate the social stigma of psychiatric diagnoses and the ways non-psychiatric physicians may inadvertently contribute to this. *(P)*
3. Appreciated the reluctance of some patients to see a psychiatrist. *(P)*
4. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for major depression. *(PLI, P)*
5. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for major depression. *(P)*
6. Respond appropriately to patients who are nonadherent to treatment for major depression. *(CS, P)*
7. Demonstrate ongoing commitment to self-directed learning regarding major depression. *(PLI, P)*
8. Appreciate the impact major depression has on a patient’s quality of life, wellbeing, ability to work, and the family. *(P)*



9. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in the diagnosis and treatment of major depression. (P, SBP)

**D. REFERENCES:**

- ⇒ Depression  
National Institute of Mental Health  
National Institutes of Health  
U.S. Department of Health and Human Services  
**[www.nimh.nih.gov/publicat//defresssion.cfm](http://www.nimh.nih.gov/publicat//defresssion.cfm)**
- ⇒ Practice Guidelines  
American Psychiatric Association  
**[www.psych.org/psych\\_pract/treatg/pg/prac\\_guide.cfm](http://www.psych.org/psych_pract/treatg/pg/prac_guide.cfm)**
- ⇒ The National Association on Mental Illness  
**[www.nami.org/Template.cfm?Section=By\\_Illness&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=54&ContentID=26414](http://www.nami.org/Template.cfm?Section=By_Illness&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=54&ContentID=26414)**
- ⇒ Mann JJ. The medical management of depression. *N Engl J Med.* 2005;353:1819-34.

## TRAINING PROBLEM #27: NOSOCOMIAL INFECTIONS

### RATIONALE:

Nosocomial infections have been occurring since the inception of the hospital. Despite many advances the incidence is still roughly five percent of all acute care hospitalizations or about two million cases a year. Nosocomial infections are estimated to approximately double the morbidity and mortality rates of any person admitted to the hospital. Directly attributable deaths can total up to 88,000 per year with the expenditure of many millions of excess health care dollars. Preventing nosocomial infections is the responsibility of every health care worker, including physicians, house officers, medical students, nurses, technicians, administrators, etc. Also considered here are occupational exposures for which health care workers are at risk.

### PREREQUISITES:

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Basic training in body substance isolation procedures.
- Microbiology and pathophysiology of the common nosocomial organisms, including *Staphylococcus aureus* (methicillin sensitive and resistant), *Staphylococcus epidermidis*, *Enterococcus* species (vancomycin sensitive and resistant), *Pseudomonas aeruginosa* and other nosocomial gram-negative bacilli, *Clostridium difficile*, and *Candida* species.
- The pharmacology of antimicrobial agents.

### SPECIFIC LEARNING OBJECTIVES:

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The epidemiology and significance of nosocomial infections in the United States. (MK)
2. The general clinical risk factors for nosocomial infection. including:
  - Immunocompromise. (MK)
  - Immunosuppressive drugs. (MK)
  - Extremes of age. (MK)
  - Compromise of the skin and mucosal surfaces secondary to:
    - Drugs. (MK)
    - Irradiation. (MK)
    - Trauma. (MK)
    - Invasive diagnostic and therapeutic procedures. (MK)
    - Invasive indwelling devices (e.g. intravenous catheter, bladder catheter, endotracheal tube, etc.). (MK)
3. The major routes of nosocomial infection transmission, including:
  - Contact. (MK)
  - Droplet. (MK)
  - Airborne. (MK)
  - Common vehicle. (MK)
4. The epidemiology, pathophysiology, microbiology, symptoms, signs, typical clinical course, and preventive strategies for the most common nosocomial infections, including:
  - Urinary tract infection. (MK)

- Pneumonia. (MK)
  - Surgical site infection. (MK)
  - Intravascular device-related bloodstream infections. (MK)
  - Skin infections. (MK)
  - Health care associated diarrhea. (MK)
5. Empiric antibiotic therapy for the most common nosocomial infections. (MK)
  6. The epidemiology, pathophysiology, microbiology, symptoms, signs, typical clinical course, and preventive strategies for colonization or infection with the following organisms:
    - Vancomycin-resistant enterococci. (MK)
    - *Clostridium difficile*. (MK)
    - Methicillin-resistant *Staphylococcus aureus*. (MRSA) (MK)
    - Multidrug-resistant Gram-negative bacteria. (MK)
  7. The crucial importance of judicious antibiotic use. (MK)
  8. The effect of widespread use of broad spectrum anti-microbial agents on endogenous body flora and the hospital microbial flora. (MK)
  9. The types of isolation procedures and their indications:
    - Standard. (MK)
    - Airborne. (MK)
    - Contact. (MK)
    - Droplet. (MK)
  10. The Centers for Disease Control and Prevention (CDC) guidelines for hand hygiene. (MK)
  11. Preventive strategies for needlestick and sharps injuries intended to reduce the transmission of bloodborne pathogens (hepatitis B, hepatitis C, and HIV). (MK)
  12. Local hospital post-exposure (i.e. after an eye/mucous membrane splash, needlestick or other sharps injury) protocols for prompt reporting, evaluation, counseling, treatment, and follow-up. (MK, SBP)
  13. The indications, efficacy, and side effects of post-exposure prophylaxis for hepatitis B and HIV/AIDS. (MK)
  14. Negative-pressure ventilation isolation for known or suspected tuberculosis patients (MK)
  15. National Institute for Occupational Safety and Health (NIOSH) approved personal respiratory protective equipment (i.e. N95 respirator) use for the prevention of transmission of *Mycobacterium tuberculosis* to health care workers. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

3. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease in the organ systems likely to be involved with nosocomial infection. (PC, CS)
  4. **Physical exam skills:** Students should be able to perform a physical examination of skin, vascular access sites, lungs, abdomen, wounds, and catheter and drain sites and recognize signs of local or systemic infection (PC)
- 
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis of the likely sites and organisms involved, recognizing specific history and physical exam findings that suggest a specific etiology. (PC, MK)
  4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance

characteristics as well as patient preferences.

Laboratory and diagnostic tests should include, when appropriate:

- Urinalysis and culture and sensitivities. *(PC, MK)*
- Sputum Gram stain and culture and sensitivities. *(PC, MK)*
- Chest radiograph. *(PC, MK)*
- Wound cultures and sensitivities. *(PC, MK)*
- *Clostridium difficile* toxin assay. *(PC, MK)*
- Hepatitis serologies. *(PC, MK)*
- HIV ELISA and western blot. *(PC, MK)*
- Sputum AFB staining and culture. *(PC, MK)*

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. *(PC, CS)*
- Elicit input and questions from the patient and his or her family about the management plan. *(PC, CS)*
- Explain the necessity for isolation procedures. *(PC, CS)*
- Counsel patients about the need for judicious antibiotic usage and the potential patient-specific and public health risks of not doing so. *(PC, CS)*

6. **Basic and advanced procedural skills:** Students should be able to:

- Obtain blood cultures. *(PC)*
- Place and interpret a PPD. *(PC)*
- Demonstrate proper sterile technique for invasive procedures. *(PC)*

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Assessing a hospitalized patient who develops a new fever 48 or more hours after admission. *(PC, MK)*
- Developing a plan for the evaluation and treatment of hospital acquired infection. *(PC, MK)*
- Demonstrating appropriate choice of antimicrobial drugs which considers mechanisms of action, spectrum of activity, pharmacokinetics, drug interactions, and adverse reactions. *(PC, MK)*
- Recognizing when indwelling intravascular and urinary collection devices should be removed. *(PC, MK)*
- Requesting appropriate isolation measures to protect other patients and health care workers. *(PC, SBP)*
- Determining when to obtain consultation from an infectious diseases specialist. *(PC, SBP)*
- Contacting hospital infection control experts when appropriate. *(SBP)*
- Using a cost-effective approach based on the differential diagnosis. *(PC, SBP)*
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to nosocomial infections. *(PC, PLI)*
- Incorporating patient needs and preferences. *(PC)*

C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Serve as a role model to all other health care providers by strictly following all infection control measures including hand hygiene and all isolation procedures. *(P, SBP)*
2. Appreciate the role physicians play in the inappropriate prescribing of antimicrobial agents and the public health ramifications. *(P, SBP)*
3. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for nosocomial infections.

(PLI, P)

4. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for nosocomial infections. (P)
5. Demonstrate ongoing commitment to self-directed learning regarding nosocomial infections. (PLI, P)
6. Appreciate the impact nosocomial infections have on a patient's quality of life, well-being, ability to work, and the family. (P)
7. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in the diagnosis, treatment, and prevention of nosocomial infections. (P, SBP)

#### D. **REFERENCES:**

- ⇒ Infection Control Guidelines  
Division of Healthcare Quality Promotion  
National Center for Infectious Diseases  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/ncidod/hip/default.htm](http://www.cdc.gov/ncidod/hip/default.htm)**
- ⇒ Vancomycin-Resistant Enterococci Division of Healthcare  
Quality Promotion National Center for Infectious Diseases  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/ncidod/hip/ARESIST/vre.htm](http://www.cdc.gov/ncidod/hip/ARESIST/vre.htm)**
- ⇒ Pautanen SM, Simor AE. Clostridium difficile associated diarrhea in adults. *Can Med Assoc J.* 2004;171:51-8.  
**[www.cmaj.ca/cgi/reprint/171/1/51](http://www.cmaj.ca/cgi/reprint/171/1/51)**
- ⇒ Healthcare-Associated MRSA Division of Healthcare Quality Promotion National Center  
for Infectious Diseases Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/ncidod/dhqp/ar\\_mrsa.html](http://www.cdc.gov/ncidod/dhqp/ar_mrsa.html)**

## TRAINING PROBLEM #28: OBESITY

### **RATIONALE:**

Obesity and overweight are recognized as ever growing epidemics in the United States. These conditions have been correlated with the development of medical conditions such as diabetes, hypertension, heart disease, and osteoarthritis. Mastery of the approach to patients who are not at an ideal body weight is important to general internists because they often deal with the sequelae of the comorbid illnesses.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Psychology associated with addictive behavior.
- Anatomy, physiology, and pathophysiology of the gastrointestinal tract and digestion.
- Pharmacology of the available drugs used to treat obesity.
- Nutrition and caloric requirements.

### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The etiology of obesity including excessive caloric intake, insufficient energy expenditure leading to low resting metabolic rate, genetic predisposition, environmental factors affecting weight gain, psychologic stressors, and lower socioeconomic status. *(MK)*
2. The definition and classification of overweight and obese using BMI. *(MK)*
3. The health implications that being overweight or obese may have on the patient. *(MK)*
4. How daily caloric requirements are calculated and the caloric deficit required to achieve a five to 10 percent weight reduction in six to 12 months. *(MK)*
5. The principles of behavior modification. *(MK)*
6. How to develop an exercise program and assist the patient in setting goals for weight loss. *(MK)*
7. Treatment options, including nonpharmacologic and pharmacologic treatment, behavioral therapy and surgical intervention. *(MK)*

B. **SKILLS:** Students should be able to demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, including:
  - Reviewing the patient's weight history from childhood. *(PC, CS)*
  - Assessing the risk factors for obesity related conditions. *(PC, CS)*
  - Assessing the patient's motivation for losing weight. *(PC, CS)*
  - Reviewing the patient's past experience with losing weight and determining barriers encountered in prior attempts. *(PC, CS)*
  - Reviewing the patient's activity level and diet. *(PC, CS)*
  - Obtaining an assessment of tobacco and drug use especially noting if the patient is in the

- process of stopping either. (PC, CS)
- Obtaining a family history focusing on weight related issues and comorbid illnesses associated with obesity. (PC, CS)
  - Obtaining a focused review of systems including signs and symptoms of secondary causes of obesity such as Cushing's syndrome, hypothyroidism, and hypogonadism. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
- Calculation of degree of obesity from the patient's height and weight by calculating BMI. (PC)
  - Noting the presence of abdominal obesity based on waist-to-hip circumference. (PC)
  - Assessing the signs of vascular disease including hypertension, carotid bruits, abdominal aortic size, blood pressure and peripheral pulses. (PC)
  - Assessing for signs of endocrine abnormalities, including: striae, peripheral neuropathy, depressed tendon reflexes, bruising, and signs of dyslipidemia (e.g. xanthomas and xanthlasma). (PC)
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology of primary and secondary obesity. (MK, PC)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.
- Laboratory and diagnostic tests should include, when appropriate:
- Serum GLC. (PC, MK)
  - TSH. (PC, MK)
  - Lipid profile. (PC, MK)
  - HbA1c. (PC, MK)
  - BUN/Cr. (PC, MK)
  - Urine microalbumin. (PC, MK)
  - ECG. (PC, MK)
  - 24-hour urinary cortisol (PC, MK)
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. (PC, CS)
  - Elicit questions from the patient and his or her family about the management plan. (PC, CS)
  - Adapt to the patient's life-style and preferences, with emphasis on the patient's role in treatment and maximizing compliance. (PC, CS)
  - Assist the patient in understanding that attainment of ideal body weight may not necessarily be a realistic goal and that health benefits may be achieved with losses of five to 10 percent body weight. (PC, CS)
6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:
- Determining when to obtain consultation from an endocrinologist, dietician, or obesity management specialist. (PC, SBP)
  - Developing reasonable weight loss goals with the patient. (PC, MK)
  - Developing a dietary plan. (PC, MK)
  - Developing a prescription for physical activity. (PC, MK)
  - Identifying indications for pharmacotherapy. (PC, MK)
  - Identifying indications for bariatric surgery. (PC, MK)

- Accessing and utilizing appropriate information systems and resources to help delineate issues related to obesity. (PC, PLI)
- Incorporating patient preferences in the treatment plan. (PC)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for obesity. (PLI, P)
2. Respond appropriately to patients who are nonadherent to treatment for obesity. (CS, P)
3. Demonstrate ongoing commitment to self-directed learning regarding obesity. (PLI, P)
4. Appreciate the impact obesity has on a patient's quality of life, well-being, ability to work, and family. (P)
5. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professions in the treatment of obesity. (P, SBP)

**D. REFERENCES:**

- ⇒ Overweight and Obesity  
National Center for Chronic Disease Prevention and Health Promotion Center for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/nccdphp/dnpa/obesity](http://www.cdc.gov/nccdphp/dnpa/obesity)**
- ⇒ Aim for a Healthy Weight National Heart, Lung, and Blood Institute Obesity Education Initiative National Institutes of Health
- ⇒ U.S. Department of Health and Human Services  
**[www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/index.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm)**
- ⇒ Screening for Obesity in Adults  
Agency for Healthcare Research and Quality  
U.S. Department of Health and Human Services  
**[www.ahrq.gov/clinic/uspstf/uspsobes.htm](http://www.ahrq.gov/clinic/uspstf/uspsobes.htm)**
- ⇒ Tsai AG, Wadden TA. Systematic review: an evaluation of major commercial weight loss programs in the United States. *Ann Intern Med.* 2005;152-56-66.
- ⇒ Buchwald H, Avidor Y, Braunwald E, et al. Bariatric surgery: a systematic review and meta-analysis. *JAMA.* 2004;292:1724-37.
- ⇒ Li Z, Maglione M, Tu W, et al. Meta-analysis: pharmacologic treatment of obesity. *Ann Intern Med.* 2005;142:532-46. \



## TRAINING PROBLEM #29: PNEUMONIA

### **RATIONALE:**

Pneumonia continues to be a major public health issue, a leading reason for hospitalization, and a significant cause of mortality. Not only that, it is an important complication of admission for other causes. Many different specialties encounter pneumonia in the course of practice, the internist most particularly.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy and physiology of the pulmonary system.
- Pathogenesis and pathophysiology of pneumonia.
- Microbiology of the common pneumonia pathogens.
- Pharmacology of antimicrobial agents.

### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The epidemiology, pathophysiology, symptoms, signs, and typical clinical course of community-acquired, nosocomial, and aspiration pneumonia and pneumonia in the immunocompromised host. *(MK)*
2. The conceptualization of “typical” and “atypical” pneumonia and its limitations. *(MK)*
3. Common pneumonia pathogens (viral, bacterial, mycobacterial, and fungal) in immunocompetent and immunocompromised hosts). *(MK)*
4. Identify patients who are at risk for impaired immunity. *(MK)*
5. Indications for hospitalization and ICU admission of patient with pneumonia. *(MK)*
6. The radiographic findings of the various types of pneumonia. *(MK)*
7. The antimicrobial treatments (e.g. antiviral, antibacterial, antimycobacterial, and antifungal) for community-acquired, nosocomial, and aspiration pneumonia, and pneumonia in the immunocompromised host. *(MK)*
8. The implications of antimicrobial resistance. *(MK)*
9. The pathogenesis, symptoms, and signs of the complications of acute bacterial pneumonia including: bacteremia, sepsis, parapneumonic effusion, empyema, meningitis, and metastatic microabscesses. *(MK)*
10. The indications for and complications of chest tube placement. *(MK)*
11. The indications for and efficacy of influenza and pneumococcal vaccinations. *(MK)*
12. The indications and procedures for respiratory isolation. *(MK)*
13. The Centers for Medicare & Medicaid Services (CMS) and the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) quality measures for community-acquired pneumonia treatment. *(MK, PLI, SBP)*

B. **SKILLS:** Students should be able to demonstrate specific skills including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:

- The presence and quantification of fever, chills, sweats, cough, sputum, hemoptysis, dyspnea, and chest pain. *(PC, CS)*
  - Historical features consistent with potential immunocompromise. *(PC, CS)*
  - potential tuberculosis exposure *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
- Accurately determining respiratory rate and level of respiratory distress. *(PC)*
  - Identifying bronchial breath sounds, rales, rhonchi, and wheezes. *(PC)*
  - Identifying signs of pulmonary consolidation. *(PC)*
  - Identifying signs of pleural effusion. *(PC)*
  - Identifying signs of the complications of pneumonia. *(PC)*
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology of pneumonia and other possible diagnoses, including:
- Common cold. *(PC, MK)*
  - Acute bronchitis. *(PC, MK)*
  - Influenza. *(PC, MK)*
  - Acute exacerbation of COPD. *(PC, MK)*
  - Asthma exacerbation. *(PC, MK)*
  - CHF. *(PC, MK)*
  - Pulmonary embolism. *(PC, MK)*
  - Aspiration. *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
- CBC. *(PC, MK)*
  - Blood cultures. *(PC, MK)*
  - ABG. *(PC, MK)*
  - Pleural fluid chemistry, cell counts, staining, and culture. *(PC, MK)*
  - Chest radiograph. *(PC, MK)*
- Students should be able to define the indications for and interpret (**with consultation**) the results of:
- Chest CT. *(PC, MK)*
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, prognosis, and subsequent follow-up to the patient and his or her family. *(PC, CS)*
  - Elicit questions from the patient and his or her family about the management plan. *(PC, CS)*
  - Educate the patient about pneumococcal and influenza immunizations. *(PC, CS)*
  - Educate the patient about the importance of smoking cessation. *(PC, CS)*
6. **Basic and advanced procedural skills:** Students should be able to:
- Place and interpret a tuberculin skin test (PPD). *(PC)*
  - Obtain blood cultures. *(PC)*
  - Obtain an ABG. *(PC)*
7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Selecting an appropriate empiric antibiotic regimen for community-acquired, nosocomial, immunocompromised-host, and aspiration pneumonia, taking into account pertinent patient features. (PC, MK)
- Adjusting antimicrobial treatment according to the sputum staining and culture results. (PC, MK)
- Recognizing the complications of pneumonia. (PC, MK)
- Determining when to obtain consultation from a pulmonologist or infectious diseases specialist. (PC, SBP)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to pneumonia. (PC, PLI)
- Incorporating patient preferences. (PC)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for the various types of pneumonia. (PLI, P)
2. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for pneumonia. (P)
3. Demonstrate ongoing commitment to self-directed learning regarding pneumonia. (PLI, P)
4. Appreciate the impact pneumonia has on a patient's quality of life, well-being, ability to work, and the family. (P)
5. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professionals in the treatment of pneumonia. (P, SBP)
6. Appreciate the importance of antimicrobial resistance. (P)
7. Appreciate the public health role of the physician when treating certain types of pneumonia (e.g. tuberculosis). (P)
8. Appreciate the importance of and demonstrate a commitment to meeting national health care quality measures for the treatment of acute MI. (P, SBP, PLI)

**D. REFERENCES:**

- ⇒ Improving Treatment Decisions for Patients with Community-Acquired Pneumonia Agency for Healthcare Research and Quality  
U.S. Department of Health and Human Services  
[www.ahrq.gov/clinic/pneumonia/pneumonria.htm](http://www.ahrq.gov/clinic/pneumonia/pneumonria.htm)
- ⇒ Ramsdell J, Narsavage GL, Fink JB. Management of community-acquired pneumonia in the home: an American College of Chest Physicians clinical position statement. *Chest*. 2005;127:1752-63.  
[www.guideline.gov/summary/summary.aspx?ss=15&doc\\_id=7325&nbr=4](http://www.guideline.gov/summary/summary.aspx?ss=15&doc_id=7325&nbr=4) 348
- ⇒ Influenza  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
[www.cdc.gov/flu/](http://www.cdc.gov/flu/)
- ⇒ Prevention of Pneumococcal Disease: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 46(RR-08);1-24. Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services

**[www.cdc.gov/mmwr/PDF/RR/RR4608.pdf](http://www.cdc.gov/mmwr/PDF/RR/RR4608.pdf)**

⇒ Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 50(RR-04);1-46. Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/mmwr/PDF/RR/RR5004](http://www.cdc.gov/mmwr/PDF/RR/RR5004)**

## TRAINING PROBLEM #30: RHEUMATOLOGIC PROBLEMS

### **RATIONALE:**

Rheumatologic diseases are an important part of the practice of internal medicine. This includes problems referring to specific joints as well as patients with systemic symptoms that are sometimes difficult to unify into a single diagnosis.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Anatomy, physiology, and pathophysiology of the musculoskeletal system.
- Basic course work in immunology.
- Pharmacology of acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), glucocorticoids, disease-modifying antirheumatic drugs (DMARDs), drugs use in the treatment of gout.
- Basic bone radiograph interpretation.

### **SPECIFIC LEARNING OBJECTIVES:**

- A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:
1. A systematic approach to joint pain based on an understanding of pathophysiology to classify potential causes. *(MK)*
  2. The effect of the time course of symptoms on the potential causes of joint pain (acute vs. subacute vs. chronic). *(MK)*
  3. The difference between and pathophysiology of arthralgia vs. arthritis and mechanical vs. inflammatory joint pain. *(MK)*
  4. The distinguishing features of intra-articular and periarticular complaints (joint pain vs. bursitis and tendonitis). *(MK)*
  5. The effect of the features of joint involvement on the potential causes of joint pain (monoarticular vs. oligoarticular vs. polyarticular, symmetric vs. asymmetric, axial and/or appendicular, small vs. large joints, additive vs. migratory vs. intermittent). *(MK)*
  6. Indications for performing an arthrocentesis and the results of synovial fluid analysis. *(MK)*
  7. The pathophysiology and common signs and symptoms of:
    - Osteoarthritis. *(MK)*
    - Crystalline arthropathies. *(MK)*
    - Septic arthritis. *(MK)*
  8. Indications for and effectiveness of intra-articular steroid injections. *(MK)*
  9. Treatment options for gout (e.g. colchicine, NSAIDs, steroids, uricosurics, xanthine oxidase inhibitors). *(MK)*
  10. The pathophysiology and common signs and symptoms of common periarticular disorders:
    - Sprain/stain. *(MK)*
    - Tendonitis. *(MK)*
    - Bursitis. *(MK)*
  11. The basic pathophysiology of autoimmunity and autoimmune diseases. *(MK)*
  12. The basic role of genetics in autoimmune disorders. *(MK)*

13. Typical clinical scenarios when systemic rheumatologic disorders should be considered:
  - Diffuse aches and pains. *(MK)*
  - Generalized weakness/fatigue. *(MK)*
  - Myalgias with or without weakness. *(MK)*
  - Arthritis with systemic signs (e.g. fever, weight loss). *(MK)*
  - Arthritis with disorders of other systems (e.g. rash, cardiopulmonary symptoms, gastrointestinal symptoms, eye disease, renal disease, neurologic symptoms). *(MK)*
14. The common signs and symptoms of and diagnostic approach to:
  - Rheumatoid arthritis. *(MK)*
  - Spondyloarthropathies (reactive arthritis/Reiter's syndrome, ankylosing spondylitis, psoriatic arthritis). *(MK)*
  - Systemic lupus erythematosus. *(MK)*
  - Systemic sclerosis. *(MK)*
  - Raynaud's syndrome/phenomenon. *(MK)*
  - Sjögren's syndrome. *(MK)*
  - Temporal arteritis and polymyalgia rheumatica. *(MK)*
  - Other systemic vasculitides. *(MK)*
  - Polymyositis and dermatomyositis. *(MK)*
  - Fibromyalgia. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history that differentiates among etiologies of disease, including:
  - Eliciting features of joint complaints:
    - Pain. *(PC, CS)*
    - Stiffness. *(PC, CS)*
    - Location. *(PC, CS)*
    - Mode of onset. *(PC, CS)*
    - Duration. *(PC, CS)*
    - Severity. *(PC, CS)*
    - Exacerbating and alleviating factors. *(PC, CS)*
    - Warmth, redness, and tenderness. *(PC, CS)*
    - Associated nonarticular symptoms. *(PC, CS)*
  - Determining when in the course of acute arthritis it is necessary to obtain a sexual history. *(PC, CS)*
  - Determining the impact of rheumatologic complaints on a patient's activities of daily living. *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - A systematic examination of all joints identifying the following abnormal findings:
    - Erythema, warmth, tenderness, and swelling. *(PC)*
    - Effusion. *(PC)*
    - Crepitus. *(PC)*
    - Altered range of motion. *(PC)*
    - Ulnar deviation. *(PC)*
    - Synovial thickening. *(PC)*
    - Joint alignment deformities (e.g. varus and valgus). *(PC)*
    - Podagra. *(PC)*

- Muscular bulk, strength, and tenderness. *(PC)*
  - Examination of the skin identifying the following abnormal findings:
    - Rheumatoid and tophaceous nodules. *(PC)*
    - Alopecia. *(PC)*
    - Malar rash. *(PC)*
    - Sclerodactyly. *(PC)*
    - Telangiectasias. *(PC)*
    - Raynaud's phenomenon. *(PC)*
    - Psoriasis. *(PC)*
    - Cutaneous manifestations of vasculitis (e.g. palpable purpura). *(PC)*
3. **Differential diagnosis:** Students should be able to generate a prioritized differential diagnosis recognizing specific history and physical exam findings that suggest a specific etiology:
- Osteoarthritis. *(PC, MK)*
  - Crystalline arthropathies. *(PC, MK)*
  - Septic arthritis. *(PC, MK)*
  - Rheumatoid arthritis. *(PC, MK)*
  - Spondyloarthropathies (reactive arthritis/Reiter's syndrome, ankylosing spondylitis, psoriatic arthritis). *(PC, MK)*
  - Systemic lupus erythematosus. *(PC, MK)*
  - Systemic sclerosis. *(PC, MK)*
  - Raynaud's syndrome/phenomenon. *(PC, MK)*
  - Sjögren's syndrome. *(PC, MK)*
  - Temporal arteritis and polymyalgia rheumatica. *(PC, MK)*
  - Other systemic vasculitides. *(PC, MK)*
  - Polymyositis and dermatomyositis. *(PC, MK)*
  - Fibromyalgia. *(PC, MK)*
5. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
- CBC with differential. *(PC, MK)*
  - Synovial fluid analysis (Gram stain, culture, crystal exam, cell count with differential, and glucose). *(PC, MK)*
  - Uric acid. *(PC, MK)*
  - ESR. *(PC, MK)*
  - Rheumatoid factor (RF). *(PC, MK)*
  - Antinuclear antibody test (ANA) and anti-DNA test. *(PC, MK)*
- Students should be able to define the indications for and interpret (**with consultation**) the results of:
- Plain radiographs of the shoulder, elbow, wrist, hand, hip, knee, ankle, and foot. *(PC, MK)*
5. **Communication skills:** Students should be able to:
- Communicate the diagnosis, treatment plan, and subsequent follow-up to patients. *(PC, CS)*
  - Elicit questions from the patient about the management plan. *(PC, CS)*
6. **Basic and advanced procedure skills:** Students should be able to:
- Assist in the performance of an arthrocentesis and intra-articular corticosteroid injection. *(PC)*
7. **Management skills:** Students should be able to develop an appropriate evaluation and

treatment plan for patients that includes:

- Selecting appropriate medications for the relief of joint pain. (PC, MK)
- Prescribing acute and preventative treatment for crystalline arthropathies. (PC, MK)
- Prescribing basic treatment options for septic arthritis. (PC, MK)
- Prescribing basic treatment options for systemic rheumatologic conditions. (PC, MK)
- Determining when to obtain consultation from a rheumatologist and orthopedic surgeon. (PC, SBP)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to rheumatologic problems. (PC, PLI)
- Incorporating patient preferences. (PC)

C. **ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection diagnostic and therapeutic interventions for rheumatologic problems. (PLI, P)
2. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for rheumatologic problems. (P)
3. Respond appropriately to patients who are nonadherent to treatment for rheumatologic problems. (CS, P)
4. Demonstrate ongoing commitment to self-directed learning regarding rheumatologic problems. (PLI, P)
5. Appreciate the impact rheumatologic problems have on a patient's quality of life, well-being, ability to work, and the family. (P)
6. Recognize the importance of and demonstrate a commitment to the utilization of other healthcare professions in the treatment of rheumatologic problems. (P, SBP)

D. **REFERENCES:**

- ⇒ Evaluation of the patient – history and physical examination, laboratory assessment, arthrocentesis and synovial fluid analysis. In Schumacher HR, Klippel JH, Koopman WJ, eds. *Primer on the Rheumatic Diseases*. 12<sup>th</sup> Ed. Atlanta, GA: Arthritis Foundation; 2001.
- ⇒ Management Guidelines  
American College of Rheumatology
- ⇒ **[www.rheumatology.org/publications/guidelines/index.asp](http://www.rheumatology.org/publications/guidelines/index.asp)**  
Arthritis Foundation
- ⇒ **[www.arthritis.org](http://www.arthritis.org)**  
National Institute of Arthritis and Musculoskeletal and Skin Diseases  
National Institutes of Health  
U.S. Department of Health and Human Services  
**[www.niams.nih.gov](http://www.niams.nih.gov)**



## TRAINING PROBLEM #31: SMOKING CESSATION

### **RATIONALE:**

Smoking is a major public health issue because it causes or aggravates many serious illnesses. Effective intervention strategies for chronic smokers have been developed using principals of behavioral counseling. These principals are applicable to other risky health behaviors. Health behavior risk assessment and intervention is now expected of physicians as part of the comprehensive care of adults. Selecting and performing an appropriate smoking cessation intervention is an important training problem for the third year medical student.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of the anatomy, physiology, and pathophysiology of the cardiopulmonary system.
- Knowledge of the pharmacology of addictive drugs.
- Knowledge of the risks of smoking, passive smoke, and smokeless tobacco.
- Appreciation of the reasons for or against discontinuing smoking.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The pharmacologic effects of nicotine. *(MK)*
2. Nicotine withdrawal symptoms. *(MK)*
3. Intervention strategies physicians can use for those patients willing and not willing to quit. *(MK)*
4. The stages of change, including:
  - Precontemplation. *(MK)*
  - Contemplation. *(MK)*
  - Preparation. *(MK)*
  - Action. *(MK)*
  - Maintenance. *(MK)*
5. The “five A’s” of smoking cessation:
  - Ask. *(MK)*
  - Advise. *(MK)*
  - Assess. *(MK)*
  - Assist. *(MK)*
  - Arrange. *(MK)*
6. The “five R’s” of smoking cessation:
  - Relevance. *(MK)*
  - Risks. *(MK)*
  - Rewards. *(MK)*
  - Roadblocks. *(MK)*
  - Repetition. *(MK)*
7. The common barriers preventing patients from undertaking smoking cessation. *(MK)*
8. The principles of at least one theory of behavior modification. *(MK)*
9. Common medical diseases associated with chronic smoking and the effects of stopping on

- future risk. *(MK)*
10. The indications for nicotine replacement therapy, pharmacotherapy (i.e. bupropion) or both. *(MK)*
  11. The association between smoking cessation and weight gain. *(MK)*
  12. The fact that tobacco dependence is considered a chronic relapsing disorder. *(MK)*
  13. The Centers for Medicare & Medicaid Services (CMS) and the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) quality measures for smoking cessation advice (i.e. all smoking patients admitted with pneumonia, HF, or an acute MI are given smoking cessation advice or counseling during hospital stay). *(MK, PLI, SBP)*

**B. SKILLS:** Students should demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, including:
  - Ask the patient if he or she uses tobacco. *(PC, CS)*
  - Determine the length and magnitude of tobacco use. *(PC, CS)*
  - Ask if the patient is interested in stopping.
  - Ask about the patient's past experiences with smoking cessation. *(PC, CS)*
  - Ask relevant questions regarding the symptoms of diseases associated with long-term smoking (e.g. CAD, COPD, PVD, CVA, lung cancer). *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
  - Identification of nicotine stains. *(PC)*
  - Identification of lesions with malignant potential on the lips and in the oral cavity. *(PC)*
  - Identification of chest findings consistent with chronic obstructive lung disease and lung cancer. *(PC)*
  - Examination of the heart and vascular system. *(PC)*
3. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences. Laboratory and diagnostic tests should include, when appropriate:
  - Complete blood count to detect erythrocytosis. *(PC, MK)*
  - Lipid profile to aid in cardiovascular stratification. *(PC, MK)*
4. **Communication skills:** Students should be able to:
  1. Ask every patient if he or she uses tobacco. *(PC, CS)*
  2. Advise every patient who smokes to stop in a nonjudgmental manner. *(PC, CS)*
  3. Assess the patient's willingness to make attempt to quit. *(PC, CS)*
  4. Assist those who are willing to make a quit attempt through counseling. *(PC, CS)*
  5. Respond positively and non-judgmentally to the patient's excuses or concerns about cessation. *(PC, CS)*
  6. Get the patient to commit to a specific action plan that can lead to complete cessation. *(PC, CS)*
  7. For those unwilling to quit, use of "5 R's" to motivate the patient:
    - Relevance. *(PC, CS)*
    - Risks. *(PC, CS)*
    - Rewards. *(PC, CS)*

- Roadblocks. (PC, CS)
  - Repetition. (PC, CS)
5. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patient, including:
- Designing an intervention that matches the stage of behavior change demonstrated by the patient. (PC, CS)
  - Explaining how to use nicotine patch, nasal spray or inhaler, and/or bupropion therapy. (PC, CS)
  - Negotiating a follow-up plan with the patient. (PC, CS)
  - Encouraging the patient to increase physical activity to lessen weight gain, if medically appropriate. (PC, CS)
  - Accessing and utilizing appropriate information systems and resources to help delineate issues/resources related to aiding smoking cessation. (PC, PLI)
  - Incorporating patient preferences. (PC)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Student should be able to:

1. Demonstrate a commitment to meeting national quality standards for smoking cessation. (P, PLI, SBP)
2. Maintain a non-judgmental attitude at all times regarding smoking cessation. (P)
3. Demonstrate a commitment to deliver a non-judgmental "stop smoking" message to every patient who smokes. (P)
4. Promote problem-solving by the patient. (P)
5. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for smoking cessation. (PLI, P)
6. Respond appropriately to patients who are non-adherent to treatment for smoking cessation. (P)
7. Demonstrate ongoing commitment to self-directed learning regarding smoking cessation. (PLI, P)
8. Appreciate the impact smoking cessation has on a patient's quality of life, well-being, ability to work, and the family. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of smoking cessation. (P, SBP)

**D. RESOURCES:**

- ⇒ Public Health Service  
Department of Health and Human Services  
Tobacco Cessation Guideline  
**[www.surgeongeneral.gov/tobacco/default.htm](http://www.surgeongeneral.gov/tobacco/default.htm)**
- ⇒ Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database of Syst Rev.* 2004;(3):CD000146.
- ⇒ Schroeder SA. What to do with a patient who smokes. *JAMA.* 2005;294:482-7.
- ⇒ Talwar A, Jain M, Vijayan VK. Pharmacotherapy of tobacco dependence. *Med Clin North Am.* 2004;88:1517-34.

## TRAINING PROBLEM #32: SUBSTANCE ABUSE

### **RATIONALE:**

Substance abuse is a prevalent problem that intersects with patient care on a variety of different levels and in patients from every socio-economic status. Being able to recognize it, counsel patients appropriately, and devise an appropriate treatment plan is integral to the practice of internal medicine.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experiences should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of drug and alcohol metabolism and physiology.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Presenting signs and symptoms of abuse of the following substances:
  - Alcohol. (MK)
  - Opioids. (MK)
  - Cocaine. (MK)
  - Amphetamines. (MK)
  - Hallucinogens. (MK)
  - Barbiturates. (MK)
  - Marijuana. (MK)
  - Anabolic steroids. (MK)
  - Benzodiazepines. (MK)
2. Signs, symptoms, risk factors for, and major causes of morbidity and mortality secondary to alcohol and drug abuse, intoxication, overdose, and withdrawal. (MK)
3. Diagnostic criteria for substance abuse, dependency and addiction. (MK)
4. Questions in the CAGE questionnaire:
  - Cut down. (MK)
  - Annoyed/angry. (MK)
  - Guilty. (MK)
  - Eye opener. (MK)
5. Health benefits of substance abuse cessation. (MK)
6. The potential role of genetics in substance abuse vulnerability. (MK)

**B. SKILLS:** Students should demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document, and present an age-appropriate medical history, that differentiates among etiologies of disease, including:
  - Social history that is elicited in a nonjudgmental, supportive manner, using appropriate questioning (e.g. CAGE questions, etc.). (PC, CS)

- Use of injection drugs and shared needles. *(PC, CS)*
  - Relevant medication history. *(PC, CS)*
  - Immune status. *(PC, CS)*
  - Family history of substance abuse. *(PC, CS)*
  - Lifestyle factors that will influence patient's access to illicit substances and interfere with ability to enable effective treatment. *(PC, CS)*
  - Screening for depression and other psychiatric disease. *(PC, CS)*
2. **Physical exam skills:** Students should be able to perform a physical exam to establish the diagnosis and severity of disease, including:
- Accurate recognition of signs that may indicate intoxication or withdrawal (e.g. behavioral or speech changes, changes in pupil size, conjunctival or nasal injection, tachycardia, sweating, piloerection, yawning, unsteady gait, etc.). *(PC, MK)*
  - Examination of the nose for septal perforation as complication of cocaine use. *(PC, MK)*
  - Examination of the skin for track marks or signs of needle use. *(PC, MK)*
  - Identification of stigmata of secondary disease states (e.g. cirrhosis – splenomegaly, gynecomastia, telangiectasias, caput medusa, etc.) *(PC, MK)*
  - Assessing for signs of endocarditis (e.g., fever, murmur, rash, etc). *(PC, MK)*
  - Obtaining full mental status examination. *(PC, MK)*
3. **Differential diagnosis:** Students should be able to generate a differential diagnosis recognizing history, physical exam and/or laboratory findings to determine the diagnosis of abuse of drugs or alcohol and their sequelae. *(PC, MK)*
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.
- Laboratory and diagnostic tests should include, when appropriate:
- Blood alcohol level. *(PC, MK)*
  - Urine and serum toxicology screens. *(PC, MK)*
  - Hepatic function panel. *(PC, MK)*
  - Amylase and lipase levels. *(PC, MK)*
  - Tests for HIV, hepatitis B and hepatitis C. *(PC, MK)*
  - CBC. *(PC, MK)*
  - Blood cultures. *(PC, MK)*
5. **Communication skills:** Students should be able to:
- Communicate the evaluation, treatment plan, and subsequent follow up to the patient and his or her family in a non-judgmental manner. *(PC, CS)*
  - Elicit questions from the patient and his or her family about the disease process and management plan. *(PC, CS)*
  - Counsel patients regarding cessation and available community referral resources. *(PC, CS, SBP)*
6. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan that includes:
- Assessing the patient's motivation for achieving sobriety/abstinence. *(PC, MK)*
  - Understanding the principles of acute management of drug/alcohol intoxication and withdrawal versus long-term treatment planning. *(MK, PC)*
  - Using Clinical Institute Withdrawal Assessment for Alcohol. (CIWA-Ar) scale in acute alcohol withdrawal to prevent seizures or delirium tremens *(MK, PC)*
  - Recommending appropriate use of benzodiazepines for alcohol withdrawal. *(MK, PC)*

- Determining when to obtain consultation from a psychiatrist. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to substance abuse. (PC, PLI)
- Incorporating patient preferences and understanding limitations of treatment. (PC)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for substance abuse. (PLI, P)
2. Respond appropriately to patients who are non-adherent to treatment for substance abuse. (CS, P)
3. Demonstrate ongoing commitment to self-directed learning regarding substance abuse. (PLI, P)
4. Appreciate the impact substance abuse has on a patient's as well as a family's quality of life, well-being, and ability to work. (P)
5. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of substance abuse. (P, SBP)

**D. REFERENCES:**

- ⇒ U.S. Preventive Services Task Force. Screening and behavioral counseling interventions in primary care to reduce alcohol misuse recommendation statement. *Ann Intern Med.* 2004;140:554-6.
- ⇒ Kosten TR, O'Connor PG. Management of drug and alcohol withdrawal. *N Engl J Med.* 2003;348:1786-95.
- ⇒ Mersy DJ. Recognition of alcohol and substance abuse. *Am Fam Physician.* 2003;67:1529-32.

## TRAINING PROBLEM #33: VENOUS THROMBOEMBOLISM

### **RATIONALE:**

Venous thromboembolic disease (DVT and PE) is a very common problem in internal medicine and one that can have devastating consequences if not appropriately diagnosed and treated. Diagnosis of DVT and PE can be especially challenging. Prophylactic measures are very effective but do not eliminate the risk.

### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam (with particular attention to the cardiac, pulmonary, and venous systems).
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of the anatomy, physiology, and pathophysiology of the cardiac, pulmonary, and venous systems.
- Physiology and pathophysiology of the hemostatic system.
- Pharmacology of antithrombotic agents.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe and discuss:

1. Risk factors for developing DVT, including:
  - Prior history of DVT/PE. *(MK)*
  - Immobility/hospitalization. *(MK)*
  - Increasing age. *(MK)*
  - Obesity. *(MK)*
  - Trauma. *(MK)*
  - Smoking. *(MK)*
  - Surgery. *(MK)*
  - Cancer. *(MK)*
  - Acute MI. *(MK)*
  - Stroke and neurologic trauma. *(MK)*
  - Coagulopathy. *(MK)*
  - Pregnancy. *(MK)*
  - Oral estrogens. *(MK)*
2. Genetic considerations predisposing to venous thrombosis. *(MK)*
3. The symptoms and signs of DVT and PE. *(MK)*
4. The differential diagnosis of DVT including the many causes of unilateral leg pain and swelling:
  - Venous stasis and the postphlebotic syndrome. *(MK)*
  - Lymphedema. *(MK)*
  - Cellulitis. *(MK)*
  - Superficial thrombophlebitis. *(MK)*
  - Ruptured popliteal cyst. *(MK)*
  - Musculoskeletal injury. *(MK)*
  - Arterial occlusive disorders. *(MK)*
5. The differential diagnosis of PE including the many causes of chest pain and dyspnea:

- MI/unstable angina. (MK)
  - Congestive heart failure. (MK)
  - Pericarditis. (MK)
  - Pneumonia/bronchitis/COPD exacerbation. (MK)
  - Asthma. (MK)
  - Pulmonary hypertension. (MK)
  - Pneumothorax. (MK)
  - Musculoskeletal pain (e.g. rib fracture, costochondritis). (MK)
6. Treatment modalities for DVT/PE, including:
    - Unfractionated heparin. (MK)
    - Low-molecular-weight heparin. (MK)
    - Warfarin. (MK)
    - Thrombolytics. (MK)
  7. The risks, benefits, and indications for inferior vena cava filters. (MK)
  8. The long-term sequelae of DVT and PE. (MK)
  9. Methods of DVT/PE prophylaxis, their indications and efficacy, including:
    - Ambulation. (MK)
    - Graded compression stockings. (MK)
    - Pneumatic compression devices. (MK)
    - Unfractionated heparin. (MK)
    - Low-molecular-weight heparin. (MK)
    - Warfarin. (MK)

**B. SKILLS:** Students should demonstrate specific skills, including:

1. **History-taking skills:** Students should be able to obtain, document and present an age-appropriate medical history that suggests the diagnosis of DVT or PE, including:
  - The presence or absence of known risk factors. (PC, CS)
  - Presence or absence of leg pain, swelling, warmth, discoloration, and palpable cord. (PC, CS)
  - The presence or absence of dyspnea, chest pain, palpitations, cough, hemoptysis. (PC, CS)
2. **Physical exam skills:** Students should be able to perform a physical examination to establish the diagnosis and severity of disease, including:
  - Assessment of vital signs (i.e. hypotension, tachycardia, tachypnea, fever) and general appearance (i.e. degree of respiratory distress, anxiety). (PC)
  - Accurate identification of leg swelling, erythema, warmth, and tenderness. (PC)
  - Inspection for signs of lower extremity trauma, arthritis, or joint effusion. (PC)
  - Identification of pleural friction rubs, wheezes, rales, rhonchi, and signs of pneumothorax. (PC)
3. **Differential diagnosis:** Students should be able to generate a differential diagnosis for a patient suspected of having DVT/PE, recognizing specific history, physical examination and laboratory findings which suggest DVT/PE, including the disease states noted above. (PC, MK)
4. **Laboratory interpretation:** Students should be able to recommend when to order diagnostic and laboratory tests and be able to interpret them, both prior to and after initiating treatment based on



the differential diagnosis, including consideration of test cost and performance characteristics as well as patient preferences.

Laboratory and diagnostic tests should include, where appropriate:

- Pulse oximetry. (PC, MK)
- 12-lead ECG. (PC, MK)
- Chest radiograph. (PC, MK)
- ABG. (PC, MK)
- D-dimer. (PC, MK)

Students should be able to define the indications for and interpret (**with consultation**) the results of:

- Duplex venous ultrasonography. (PC, MK)
- Ventilation perfusion (V/Q) scan. (PC, MK)
- CT angiography. (PC, MK)
- Pulmonary angiography. (PC, MK)
- Echocardiography. (PC, MK)

5. **Communication skills:** Students should be able to:

- Communicate the diagnosis, treatment plan, and subsequent follow-up to the patient and his or her family. (PC, CS)
- Elicit questions from the patient and his or her family about the management plan. (PC, CS)

6. **Basic and advanced procedural skills:** Students should be able to:

- Perform a 12-lead ECG. (PC)
- Obtain an ABG. (PC)

7. **Management skills:** Students should be able to develop an appropriate evaluation and treatment plan for patients that includes:

- Outlining the acute and long-term treatment of isolated calf vein phlebitis, superficial thrombophlebitis, DVT, and thromboembolism, including appropriate use and monitoring of heparin and warfarin. (MK, PC)
- Understanding the indications for placement of inferior vena cava filter, indications and complications of thrombolytic therapy, as well as indications for performing a hypercoagulability work-up. (PC, MK)
- Determining when to obtain consultation from a pulmonologist or interventional radiologist. (PC, MK)
- Using a cost-effective approach based on the differential diagnosis. (PC, SBP)
- Accessing and utilizing appropriate information systems and resources to help delineate issues related to venous thromboembolism. (PC, PLI)
- Incorporating patient preferences. (PC)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for venous thromboembolic disease. (PLI, P)
2. Respond appropriately to patients who are non-adherent to treatment for venous thromboembolic disease. (CS, P)
3. Demonstrate ongoing commitment to self-directed learning regarding venous thromboembolic disease. (PLI, P)
4. Appreciate the impact venous thromboembolic disease has on a patient's quality of life, well-

- being, ability to work, and the family. (P)
5. Recognize the importance and demonstrate a commitment to the utilization of other healthcare professions in the treatment of venous thromboembolic disease. (P, SBP)

**D. REFERENCES:**

- ⇒ American College of Chest Physicians. The seventh ACCP conference on antithrombotic and thrombolytic therapy: evidence-based guidelines. *Chest*. 2004;126 (Number 3 Supplement)  
**[www.chestjournal.org/content/vol126/3\\_suppl](http://www.chestjournal.org/content/vol126/3_suppl)**
- ⇒ Spyropoulos AC. Emerging strategies in the prevention of venous thromboembolism in hospitalized medical patients. *Chest*. 2005;128:958-69.
- ⇒ Stein PD, Hull RD, Patel KC, Olson RE, Ghali WA, Brant R, Biel RK, Bharadia V, Kalra NK. D-dimer for the exclusion of acute venous thrombosis and pulmonary embolism: a systematic review. *Ann Intern Med*. 2004;140:589-602.
- ⇒ Bates SM, Ginsberg JS. Clinical practice. Treatment of deep-vein thrombosis. *N Engl J Med*. 2004;351:268-77.
- ⇒ Fedullo PF, Tapson VF. Clinical practice. The evaluation of suspected pulmonary embolism. *N Engl J Med*. 2003;349:1247-56.

# GENERAL CLINICAL CORE COMPETENCIES IN INTERNAL MEDICINE

## #1 DIAGNOSTIC DECISION MAKING

### RATIONALE:

Physicians are responsible for directing and conducting the diagnostic evaluation of a broad range of patients, including patients seeking advice on prevention of and screening for disease and patients with acute and chronic illnesses. In a time of rapidly proliferating tests, medical students must learn how to design safe, expeditious, and cost-effective diagnostic evaluations. This requires well-developed diagnostic decision-making skills that incorporate probability-based thinking.

### PREREQUISITES:

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Required course in pathophysiology.
- Required course in clinical epidemiology and biostatistics.
- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.

### SPECIFIC LEARNING OBJECTIVES:

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Key history and physical examination findings pertinent to the differential diagnosis. *(MK)*
2. Information resources for determining diagnostic options for patients with common and uncommon medical problems. *(MK, PLI)*
3. Key factors to consider when selecting from among diagnostic tests, including pretest probabilities, performance characteristics of tests (sensitivity, specificity, likelihood ratios), cost, risk, and patient preferences. *(MK, P)*
4. The basics of the potential role of genetic information in diagnostic decision making. *(MK)*
5. Relative cost of diagnostic tests. *(MK)*
6. How critical pathways or practice guidelines can be used to guide diagnostic test ordering. *(MK)*
7. The methods of deductive reasoning, forward thinking, and pattern recognition in clinical decision making. *(MK)*

B. **SKILLS:** Students should demonstrate specific skills, including:

1. Identifying problems with which a patient presents, appropriately synthesizing these into logical clinical syndromes. *(PC)*
2. Identifying which problems are of highest priority. *(PC)*
3. Formulating a differential diagnosis based on the findings from the history and physical examination. *(PC)*
4. Using probability-based thinking and pattern recognition to identify the most likely diagnoses. *(PC)*
5. Using the differential diagnosis to help guide diagnostic test ordering and sequencing. *(PC)*
6. Using pretest probabilities and scientific evidence about performance characteristics of tests (sensitivity, specificity, likelihood ratios) to determine post-test probabilities according to the predictive value paradigm. *(PC)*
7. Participating in selecting the diagnostic studies with the greatest likelihood of providing useful results at a reasonable cost. *(PC)*

8. Communicating the prioritized differential diagnosis to the patient and his or her family. (CS)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Incorporate the patient's perspective into diagnostic decision making. (P)
2. Recognize the importance of patient preferences when selecting among diagnostic tests. (P)
3. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic tests. (PLI, P)
4. Seek feedback regularly regarding diagnostic decision making and respond appropriately and productively. (P)
5. Limit the chances of false positive/false negative results by demonstrating thoughtful test selection. (P)
6. Appreciate the element of uncertainty in diagnostic testing, including the occurrence and causes of false positive and false negative results. (P)
7. Appreciate the impact uncertainty may have on the patient. (P)
8. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in diagnostic decision making. (P, SBP)

**D. REFERENCES:**

- ⇒ Mark, DB. Decision-making in clinical medicine. In Kasper DL, Braunwald EB, Fauci AS, Hauser SL, Longo DL, Jameson JL, eds. *Harrison's Principles of Internal Medicine*. 16th ed. New York, NY: McGraw-Hill; 2005:6-13.
- ⇒ Strauss SE, Richardson WS, Glasziou P, Haynes RB. *Evidence Based Medicine: How to Practice and Teach EBM*. 3rd ed. New York, NY: Churchill Livingstone; 2005.
- ⇒ Primer to the Internal Medicine Clerkship A Guide Produced by the Clerkship Directors in Internal Medicine Clerkship Directors in Internal Medicine  
[www.im.org/CDIM/primer.htm](http://www.im.org/CDIM/primer.htm)
- ⇒ Ferri FF. Differential diagnosis. In Ferri FF, ed. *Practical Guide to the Care of the Medical Patient*. 6th ed. St. Louis, MO: Mosby; 2004:39-113.

## GENERAL CLINICAL CORE COMPETENCIES

### #2 CASE PRESENTATION

#### **RATIONALE:**

Communicating patient care information to colleagues and other health care professionals is an essential skill regardless of specialty. Internists have traditionally given special attention to case presentation skills because of the comprehensive nature of patient evaluations and the various settings in which internal medicine is practiced. Students should develop facility with different types of case presentations: written and oral, new patient and follow-up, inpatient and outpatient.

#### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.

#### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Components of comprehensive and abbreviated case presentations (oral and written) and settings appropriate for each. (*MK*)

B. **SKILLS:** Students should be able to demonstrate specific skills, including:

1. Prepare legible, comprehensive, and focused new patient workups that include the following features as clinically appropriate:
  - Chief complaint. (*PC, CS*)
  - Identifying data. (*PC, CS*)
  - Concise history of the present illness organized chronologically, with minimal repetition, omission, or extraneous information, and including pertinent positives and negatives. (*PC, CS*)
  - Past medical history, including relevant details. (*PC, CS*)
  - Medications with dosages and frequencies, including herbals, supplements, and over-the-counter medications. (*PC, CS*)
  - Allergies with specific details of the reaction. (*PC, CS*)
  - Substance use, including tobacco, alcohol, and illicit drugs. (*PC, CS*)
  - Family history. (*PC, CS*)
  - Social history. (*PC, CS*)
  - Review of symptoms. (*PC, CS*)
  - A comprehensive physical examination with detail pertinent to the patient's problem. (*PC, CS*)
  - A succinct, prioritized, and where appropriate complete list of all problems identified by the history and physical examination. (*PC, CS*)
  - A differential diagnosis (appropriate for the student's level of training) for each problem that is neither over-inclusive or under-inclusive, addresses all reasonable possibilities, pays special attention to diagnoses that are potentially the most serious or life-threatening, and is supported by the use of pertinent positives and negatives. (*PC, CS*)

- A diagnostic and treatment plan for each problem (appropriate for the student's level of training). (*PC, CS*)
2. Orally present a new inpatient's or outpatient's case in a manner that includes the following characteristics:
    - Logically and chronologically develops the history of the present illness and tells the patient's "story." (*PC, CS*)
    - Summarizes the pertinent positives and negatives. (*PC, CS*)
    - Succinctly presents past medical history, family history, social history, and review of symptoms. (*PC, CS*)
    - Includes a logical, organized, and prioritized differential diagnosis. (*PC, CS*)
    - Includes diagnostic and therapeutic plans. (*PC, CS*)
    - Can be made briefer when necessary. (*PC, CS*)
    - Is presented as much from memory as possible with minimal reference to memory aids with the exception of highly important dates, diagnostic tests, laboratory values. (*PC, CS*)
  3. Orally present a follow-up inpatient's or outpatient's case in a manner that includes the following characteristics:
    - Focused and very concise. (*PC, CS*)
    - Problem-based. (*PC, CS*)
    - Emphasizes pertinent new findings. (*PC, CS*)
    - Includes diagnostic and therapeutic plans. (*PC, CS*)
    - Can be made briefer when necessary. (*PC, CS*)
    - Is presented as much from memory as possible with minimal reference to memory aids with the exception of highly important dates, diagnostic tests, laboratory values. (*PC, CS*)
  4. Produce inpatient or outpatient progress notes in a manner that includes the following characteristics:
    - Is appropriately titled. (*PC, CS*)
    - Includes a brief subjective that addresses new or changed patient symptoms. (*PC, CS*)
    - Provides an accurate and succinct accounting of the objective data (e.g. vital signs, in/outs, telemetry monitoring, focused physical examination, laboratory results, and diagnostic tests). (*PC, CS*)
    - Includes a prioritized problem list with a concise assessment and plan for each. (*PC, CS*)
  5. Select the mode of presentation that is most appropriate to the clinical situation (e.g. written vs. oral, long vs. short, etc.). (*PC, CS*)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate ongoing commitment to self-directed learning regarding case presentation skills by regularly seeking feedback on presentations. (*PLI, P*)
2. Respond appropriately and productively to feedback regarding performance. (*P*)
3. Accurately and objectively record and present all data. (*P*)

4. Demonstrate respect for the patient's privacy when dealing with protected health information and follow Health Information Portability and Accountability Act (HIPAA) standards. (P)

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## GENERAL CLINICAL CORE COMPETENCIES

### #3 HISTORY TAKING AND PHYSICAL EXAMINATION

#### **RATIONALE:**

The ability to obtain an accurate medical history and carefully perform a physical examination is fundamental to providing comprehensive care to adult patients. In particular, the internist must be thorough and efficient in obtaining a history and performing a physical examination with a wide variety of patients, including healthy adults (both young and old), adults with acute and chronic medical problems, adults with complex life-threatening diseases, and adults from diverse socioeconomic and cultural backgrounds. The optimal selection of diagnostic tests, choice of treatment, and use of subspecialists, as well as the physician's relationship and rapport with patients, all depend on well-developed history-taking and physical diagnosis skills. These skills, which are fundamental to effective patient care, should be a primary focus of the student's work during the core clerkship in internal medicine.

#### **PREREQUISITES:**

- Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:
- Required pre-clinical courses in physical examination and physician-patient communication (should include instruction in breast, pelvic, rectal, and male genital exams).
- Ability to perform a complete medical history and physical exam on a wide variety of patients including adolescents and older adults.
- Ability to effectively communicate with patients of diverse backgrounds.
- Basic skills for obtaining a history related to substance abuse, sexual, occupational, and mental health.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The significant attributes of a symptom, including: location and radiation, intensity, quality, temporal sequence (onset, duration, frequency), alleviating factors, aggravating factors, setting, associated symptoms, functional impairment, and patient's interpretation of symptom. *(MK)*
2. The four methods of physical examination (inspection, palpation, percussion, and auscultation), including where and when to use them, their purposes, and the findings they elicit. *(MK)*
3. The physiologic mechanisms that explain key findings in the history and physical exam. *(MK)*
4. The diagnostic value of the history and physical examination. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Using language appropriate for each patient. *(PC, CS)*
2. Using non-verbal techniques to facilitate communication and pursue relevant inquiry. *(PC, CS)*
3. Eliciting the patient's chief complaint as well as a complete list of the patient's concerns. *(PC, CS)*
4. Obtaining a patient's history in a logical, organized, and thorough manner, covering the following:



- History of present illness. (*PC, CS*)
  - past medical history (including usual source of and access to health care, childhood and adult illnesses, injuries, surgical procedures, obstetrical history, psychiatric problems, sexual history, and hospitalizations). (*PC, CS*)
  - Preventive health measures. (*PC, CS*)
  - Medications with dosages and frequencies, including herbals, supplements, and over-the-counter medications. (*PC, CS*)
  - Allergies with specific details of the reaction. (*PC, CS*)
  - Substance use including tobacco, alcohol, and illicit drugs. (*PC, CS*)
  - Family history. (*PC, CS*)
  - Social history. (*PC, CS*)
  - Occupational history. (*PC, CS*)
  - Review of symptoms. (*PC, CS*)
5. Obtaining, whenever necessary, supplemental historical information from collateral sources, such as significant others or previous physicians. (*PC, CS*)
  6. Demonstrating proper hygienic practices whenever examining a patient. (*PC*)
  7. Positioning the patient and self properly for each part of the physical examination. (*PC*)
  8. Performing a physical examination for a patient in a logical, organized, respectful, and thorough manner, including:
    - The patient's general appearance. (*PC*)
    - Vital signs. (*PC*)
    - Pertinent body regions/organ systems. (*PC*)
    - When appropriate breast, pelvic, rectal, male genital exams. (*PC*)
    - When appropriate fundoscopic exam. (*PC*)
    - When appropriate full neurologic exam. (*PC*)
  9. Adapting the scope and focus of the history and physical exam appropriately to the medical situation and the time available. (*PC*)
  10. Being observant of the patient's modesty as much as possible. (*PC, P*)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Appreciate the essential contribution of a pertinent and history and physical examination to patient care. (*P*)
2. Demonstrate ongoing commitment to self-directed learning regarding history taking and physical examination skills. (*PLI, P*)
3. Seek feedback regularly regarding history and physical examination skills and respond appropriately and productively. (*P*)
4. Recognize the importance of and demonstrate a commitment to the utilization of other health care professions in obtaining a history and physical examination (e.g. interpreter services, advanced practice nurses, etc.). (*P, SBP*)
5. Establish a habit of updating historical information and repeating important parts of the physical examination during follow-up visits. (*P*)
6. Demonstrate consideration for the patient's modesty, feelings, limitations, and sociocultural background whenever taking a history and performing a physical examination. (*P*)
7. Appreciate that some patients will be very anxious about the physical examination, particularly the breast, pelvic, rectal, and male genital exams. (*P*)

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**[www.blaufuss.org](http://www.blaufuss.org)**

## GENERAL CLINICAL CORE COMPETENCIES

### #4 COMMUNICATION AND RELATIONSHIPS WITH PATIENTS AND COLLEAGUES

#### **RATIONALE:**

The physician-patient relationship forms the core of the practice of internal medicine. Many physicians view it as the most satisfying aspect of their work. The medical interview and the relationship between physician and patient are important diagnostic and therapeutic tools. Effective communication skills are needed for a physician to serve as an effective patient advocate. Communication skills also are needed to address patient concerns and requests. Proficiency in communicating with patients results in increased patient and physician satisfaction, increased adherence to therapy, and reduced risk of malpractice claims. The student on the internal medicine clerkship interacts with a diverse array of patients, physicians, and other health team members, necessitating proficiency in communication and interpersonal skills. Students also witness how diversities of age, gender, race, culture, socioeconomic class, personality, and intellect require a sensitive and flexible approach. The result of proficiency in communication and interpersonal skills is increased satisfaction for both doctor and patient.

#### **PREREQUISITES:**

- Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:
- Required pre-clinical courses in physician-patient communication.
- Ability to perform a complete medical history on a wide variety of patients, including adolescents and older adults.
- Ability to communicate with patients of diverse backgrounds.
- Basic skills for obtaining a history related to substance abuse and sexual, occupational, and mental health.
- Basic skills for discussing issues relating to advance directives.
- Basic skills for breaking bad news.

#### **SPECIFIC LEARNING OBJECTIVES:**

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. How patients' and physicians' perceptions, preferences, and actions are affected by cultural and psychosocial factors and how these factors affect the doctor-patient relationship. *(MK, P)*
2. The role and contribution of each team member to the care of the patient. *(MK, SBP)*
3. The role of psychosocial factors in team interactions. *(MK)*
4. The role of the physician as patient advocate. *(MK)*
5. Strategies for establishing positive patient-doctor relationships. *(MK)*
  6. Patient, physician, and system barriers to successfully negotiated treatment plans and patient adherence; strategies that may be used to overcome these barriers. *(MK, SBP)*
6. Useful strategies when communicating with patients via an interpreter. *(MK)*
7. Basic techniques for breaking bad news. *(MK)*
8. Basic tenants of genetic counseling. *(MK)*

B. **SKILLS:** Students should be able to demonstrate specific skills, including:

1. Demonstrating appropriate listening skills, including verbal and non-verbal techniques (e.g., restating, probing, clarifying, silence, eye contact, posture, touch) to communicate empathy and help educate the patient. (CS)
2. Demonstrating effective verbal skills including appropriate use of open- and closed-ended questions, repetition, facilitation, explanation, and interpretation. (CS)
3. Determining the information a patient has independently obtained about his or her problems. (CS)
4. Identifying patients' emotional needs. (CS)
5. Respond to empathic opportunities by naming the emotions or feelings expressed. (CS)
6. Eliciting the patient's point of view and concerns about his or her illness and the medical care he or she is receiving. (CS)
7. Discussing how the health problem affects the patient's life. (CS)
8. Determining the extent to which a patient wants to be involved in making decisions about his or her care. (CS)
9. Providing basic information and an explanation of the diagnosis, prognosis, and treatment plan. (CS)
10. Responding to patients' concerns and expectations. (CS)
11. With guidance and direct supervision, participating in breaking bad news to patients. (CS)
12. With guidance and direct supervision, participating in discussing basic issues regarding advance directives with patients and their families. (CS)
13. With guidance and direct supervision, participating in discussing basic end-of life issues with patients and their families. (CS)
14. Assessing patient commitment and adherence to a treatment plan taking into account personal and economic circumstances. (CS)
15. Working with a variety of patients, including multi-problem patients, angry patients, somatizing patients, and substance abuse patients. (CS)
16. Working as an effective member of the patient care team, incorporating skills in inter-professional communication and collaboration. (CS, SBP)
17. Giving and receiving constructive feedback. (CS)
18. Orally presenting a new inpatient's or outpatient's case in a manner that includes the following characteristics:
  - Logically and chronologically develops the history of the present illness and tells the patient's "story." (PC, CS)
  - Summarizes the pertinent positives and negatives. (PC, CS)
  - Succinctly presents past medical history, family history, social history, and review of symptoms. (PC, CS)
  - includes a logical, organized, and prioritized differential diagnosis (PC, CS)
  - Includes diagnostic and therapeutic plans. (PC, CS)
  - Can be made briefer when necessary. (PC, CS)
  - Is presented as much from memory as possible with minimal reference to memory aids with the exception of highly important dates, diagnostic tests, laboratory values. (PC, CS)
19. Orally presenting a follow-up inpatient's or outpatient's case in a manner that includes the following characteristics:
  - Is focused, very concise, and problem-based. (PC, CS)
  - Emphasizes pertinent new findings. (PC, CS)
  - Includes diagnostic and therapeutic plans. (PC, CS)

- Can be made briefer when necessary. (PC, CS)
  - Is presented as much from memory as possible with minimal reference to memory aids with the exception of highly important dates, diagnostic tests, and laboratory values. (PC, CS)
20. Demonstrating the ability to make clear and concise presentations about topics assigned to research. (CS)
  21. Demonstrating basic strategies for conflict management and resolution. (CS)
  22. Demonstrating basic techniques of communication with non-English speaking patient via an interpreter. (PC, CS)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate ongoing commitment to self-directed learning regarding effective doctor-patient communication skills. (PLI, P)
2. Seek feedback regularly regarding communication skills and respond appropriately and productively. (P)
3. take into consideration in each case the patient's psychosocial status (P)
4. Demonstrate respect for patients. (P)
5. Involve the patient actively in his or her health care whenever possible. (P)
6. Demonstrate teamwork and respect toward all members of the health care team, as manifested by reliability, responsibility, honesty, helpfulness, selflessness, and initiative in working with the team. (SBP, P)
7. Attend to or advocate for the patient's interests and needs in a manner appropriate to the student's role. (P)
8. Maintain confidentiality when dealing with protected health information and follow Health Information Portability and Accountability Act (HIPAA) guidelines. (P, SBP)

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## GENERAL CLINICAL CORE COMPETENCIES

### #5 INTERPRETATION OF CLINICAL INFORMATION

#### **RATIONALE:**

In the routine course of clinical practice, most physicians are required to order and interpret a wide variety of diagnostic tests and procedures. Determining how these test results will influence clinical decision making and communicating this information to patients in a timely and effective manner are core clinical skills that third-year medical students should possess.

#### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:

- Introductory course in clinical pathology and laboratory medicine.
- Introductory course in epidemiology and biostatistics.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to:

1. Interpret specific diagnostic tests and procedures that are ordered to evaluate patients who present with common symptoms and diagnoses encountered in the practice of internal medicine. (PC, MK)
2. Take into account:
  - Important differential diagnostic considerations, including potential diagnostic emergencies. (PC, MK)
  - Pre-test and post-test likelihood of disease (probabilistic reasoning). (PC, MK)
  - Performance characteristics of individual tests. (sensitivity, specificity, positive and negative predictive value, likelihood ratios). (PC, MK)
3. Define and describe for the tests and procedures listed:
  - Indications for testing. (PC, MK)
  - Range of normal variation. (PC, MK)
  - Critical values that require immediate attention. (PC, MK)
  - Pathophysiologic implications of abnormal results. (PC, MK)
  - Relative cost. (MK, SBP)
4. Independently interpret the results of the following laboratory tests:
  - CBC with diff and blood smear. (PC, MK)
  - UA. (PC, MK)
  - Electrolytes. (PC, MK)
  - BUN/Cr. (PC, MK)
  - GLC. (PC, MK)
  - Hepatic function panel. (PC, MK)
  - Hepatitis serologies. (PC, MK)
  - Cardiac biomarkers (e.g. myoglobin, CK-MB, and Troponin I/T). (PC, MK)
  - Routine coagulation tests (e.g. PT/PTT and INR). (PC, MK)
  - Thyroid function tests (e.g. T3, T4, and TSH). (PC, MK)
  - ABG. (PC, MK)
  - Body fluid cell counts and chemistries. (PC, MK)
5. Independently interpret the results of the following diagnostic procedures:

- 12-lead ECG. (PC, MK)
  - Chest radiograph. (PC, MK)
  - Plain abdominal films (e.g. obstructive series, KUB). (PC, MK)
  - Pulmonary function tests. (PC, MK)
6. Describe the basic electrophysiologic events that produce the surface ECG. (MK)
  7. Describe how errors in test interpretation can affect clinical outcomes and costs. (PC, MK)
  8. Describe the concept of a threshold as it relates to testing and treatment decisions. (PC, MK)
  9. Describe the basic principles of using genetic information in clinical decision making. (PC, MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Interpreting a blood smear, Gram stain, and UA. (PC)
2. Approaching ECG interpretation in a systematic and logical fashion analyzing the following: rate, rhythm, P wave morphology, PR interval, QRS width, axis, voltage, QT interval, ST segment morphology, and T wave morphology. (PC)
3. Recognizing the following on ECG:
  - Sinus tachycardia, sinus bradycardia, sinus arrhythmia. (PC)
  - Premature atrial beats, ectopic atrial rhythm/tachycardia, narrow complex supraventricular tachycardia. (PC)
  - Multifocal atrial tachycardia, atrial flutter, atrial fibrillation (PC)
  - First degree, second degree (Mobitz type I and II), and third degree (complete) heart block. (PC)
  - Junctional rhythm. (PC)
  - Premature ventricular beats. (PC)
  - Typical ventricular tachycardia, ventricular fibrillation. (PC)
  - Left and right atrial enlargement. (PC)
  - Left ventricular hypertrophy. (PC)
  - Left and right bundle branch block, left anterior and posterior fascicular block. (PC)
  - The characteristic features of a properly functioning ventricular or dual chamber pacemaker. (PC)
  - The delta wave in Wolf-Parkinson-White Syndrome. (PC)
  - The classic features of myocardial ischemia and infarction and be able to localize the findings (i.e. inferior, anterior, lateral, posterior, right ventricular) and identify the probable culprit vessel. (PC)
  - The classic features of pulmonary embolism. (PC)
  - The characteristic effects of hypo- and hyperkalemia. (PC)
4. Approaching chest radiography interpretation in a systematic and logical fashion analyzing the following: technique (e.g. view, rotation, exposure), visible abdomen, soft tissues and bones of the thorax, mediastinum/hila, and lungs. (PC)
5. Recognizing the following on chest radiograph:
  - Rib fracture. (PC)
  - Cardiomegaly. (PC)
  - Lobar pneumonia. (PC)
  - Pleural effusion. (PC)
  - Pneumothorax. (PC)
  - Pulmonary nodule. (PC)

- Pulmonary edema/“congestive heart failure” (e.g. cardiomegaly, pulmonary vascular redistribution, Kerley’s B Lines, interstitial/alveolar edema). (PC)
  - Hilar lymphadenopathy. (PC)
  - Mediastinal widening. (PC)
6. Recording the results of laboratory tests in an organized manner, using flow sheets when appropriate. (PC)
  7. Estimating the pre-test likelihood of a disease or condition. (PC, MK)
  8. Estimating the post-test probability of disease and stating the clinical significance of the results of laboratory tests and diagnostic procedures. (PC, MK)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for acute MI. (PLI, P, SBP)
2. Regularly seek feedback regarding interpretation of clinical information and respond appropriately and productively. (P)
3. Recognize the importance of patient preferences when selecting among diagnostic testing options. (P)
4. Demonstrate ongoing commitment to self-directed learning regarding test interpretation. (PLI, P)
5. Appreciate the implications of test results before ordering tests. (P)
6. Appreciate the importance of follow-up on all diagnostic tests and procedures and timely communication of information to patients and appropriate team members. (P)
7. Demonstrate a commitment to excellence by personally reviewing radiographs, ECGs, Gram stains, blood smears, etc. to assess the accuracy and significance of the results. (P)

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**[www.med-ed.virginia.edu/courses/rad/cxr/index.html](http://www.med-ed.virginia.edu/courses/rad/cxr/index.html)**

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## GENERAL CLINICAL CORE COMPETENCIES

### #6 THERAPEUTIC DECISION MAKING

#### **RATIONALE:**

Internists are responsible for directing and coordinating the therapeutic management of patients with a wide variety of problems, including critically ill patients with complex medical problems and the chronically ill. To manage patients effectively, physicians need basic therapeutic decision-making skills that incorporate both pathophysiologic reasoning and evidence-based knowledge.

#### **PREREQUISITES:**

- Introductory coursework in clinical epidemiology and biostatistics.
- Introductory coursework in physiology and pathology.
- Introductory coursework in pharmacology.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Information resources for determining medical and surgical treatment options for patients with common and uncommon medical problems. (*MK*)
2. Key factors to consider in choosing among treatment options, including risk, cost, evidence about efficacy, and consistency with pathophysiologic reasoning (*MK*)
3. How to use critical pathways and clinical practice guidelines to help guide therapeutic decision making. (*MK*)
4. Factors that frequently alter the effects of medications, including drug interactions and compliance problems. (*MK*)
5. Factors to consider in selecting a medication from within a class of medications. (*MK*)
6. Factors to consider in monitoring a patient's response to treatment, including potential adverse effects. (*MK*)
7. Various ways that evidence about clinical effectiveness is presented to clinicians and the potential biases of using absolute or relative risk or number of patients needed to treat. (*MK*)
8. Methods of monitoring therapy and how to communicate them in both written and oral form. (*MK*)
9. The basics of the potential role of genetic information in therapeutic decision making. (*MK*)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Formulating an initial therapeutic plan. (*PC*)
2. Changing the therapeutic plan when goals of care change (e.g. a shift toward palliative care). (*PC*)
3. Accessing and utilizing, when appropriate, information resources to help develop an appropriate and timely therapeutic plan. (*PC, PLI*)
4. Explaining the extent to which the therapeutic plan is based on pathophysiologic reasoning and scientific evidence of effectiveness. (*PC*)
5. Beginning to estimate the probability that a therapeutic plan will produce the desired outcome. (*PC*)
6. Writing prescriptions and inpatient orders safely and accurately. (*PC*)
7. Counseling patients about how to take their medications and what to expect when doing so, including beneficial outcomes and potential adverse effects. (*PC, CS*)

8. Monitoring response to therapy. (PC)
9. Recognizing when to seek consultation for additional diagnostic and therapeutic recommendations. (PC, SBP)
10. Recognizing when to screen for certain conditions based on age and risk factors and what to do with the results of the screening tests. (PC)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based consideration in the selection of therapeutic interventions. (PLI, P)
2. Demonstrate ongoing commitment to self-directed learning regarding therapeutic interventions. (PLI, P)
3. Seek feedback regularly regarding therapeutic decision making and respond appropriately and productively. (P)
4. Appreciate the impact therapeutic decisions have on a patient's quality of life (P)
5. Incorporate the patient in therapeutic decision making, explaining the risks and benefits of treatment. (CS, P)
6. Respect patients' autonomy and informed choices, including the right to refuse treatment. (P)
7. Demonstrate an understanding of the importance of close follow-up of patients under active care. (P)
8. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in therapeutic decision making. (P, SBP)

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## **GENERAL CLINICAL CORE COMPETENCIES**

### **#7 BIOETHICS OF CARE**

**RATIONALE:**

A basic understanding of ethical principles and their application to patient care is essential for all physicians. During the internal medicine core clerkship, the student can put into practice some of the ethical principles learned in the preclinical years, especially by participating in discussions of informed

consent and advance directives. Additionally, the student learns to recognize ethical dilemmas and respect different perceptions of health, illness, and health care held by patients of various religious and cultural backgrounds.

**PREREQUISITES:**

Introductory course on medical ethics providing a basic understanding of ethical principles and fiduciary relationships and their application in clinical medicine:

- Autonomy.
- Beneficence.
- Nonmaleficence.
- Truth-telling.
- Confidentiality.
- Respect for autonomy (informed choice).

**SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Basic ethical principles (autonomy, beneficence, nonmaleficence, truth-telling, confidentiality, and autonomy). *(MK)*
2. The patient's right to refuse care. *(MK)*
3. The unique nature of a fiduciary relationship. *(MK)*
4. Basic elements of informed consent. *(MK)*
5. Circumstances under which informed consent is necessary and unnecessary *(MK)*
6. Basic concepts of treatment efficacy, quality of life, and societal demands. *(MK)*
7. Potential conflicts between individual patient preferences and societal demands *(MK)*
8. The role of the physician in making decisions about the use of expensive or controversial tests and treatments. *(MK)*
9. Bioethical concerns regarding genetic information, privacy issues in particular. *(MK)*
10. The unique bioethical concerns regarding end-of-life care. *(MK)*
11. Circumstances when withholding or withdrawing care is acceptable. *(MK)*
12. The role of federal and state legislation in governing health care. *(MK)*
13. Circumstances when it may be unavoidable or acceptable to breach the basic ethical principles. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Participating in a discussion about advance directives with a patient. *(PC, CS)*
2. Participating in obtaining informed consent for a procedure. *(PC, CS)*
3. Participating in explaining and obtaining informed consent for genetic testing *(PC, CS)*
4. Participating in a preceptor's discussion with a patient about a requested treatment that may not be considered appropriate (e.g., not cost-effective). *(PC, CS)*
5. Participating in family and interdisciplinary team conferences discussing end-of-life care and incorporating the patient's wishes in that discussion. *(PC, CS, SBP)*
6. Obtaining additional help from ethics experts in conflict resolution. *(PC, SBP)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate ongoing commitment to self-directed learning regarding bioethics. (*PLI*)
2. Recognize the importance of patient preferences, perspectives, and perceptions regarding health and illness. (*P*)
3. Demonstrate a commitment to caring for all patients, regardless of the medical diagnosis, gender, race, socioeconomic status, intellect/level of education, religion, political affiliation, sexual orientation, ability to pay, or cultural background. (*P*)
4. Recognize the importance of allowing terminally ill patients to die with comfort and dignity when that is consistent with the wishes of the patient and/or the patient's family. (*P*)
5. Recognize the potential conflicts between patient expectations and medically appropriate care. (*P*)
6. Respond appropriately to patients who are nonadherent to treatment. (*P*)
7. Demonstrate respect for the patient's privacy and confidentiality when dealing with protected health information and follow HIPAA standards. (*P*)
8. Appreciate the psychological impact genetic information may have on patients. (*P*)

**D. REFERENCES:**

- ⇒ Bioethics Resources on the Web  
Inter-Institute Bioethics Interest Group  
National Institutes of Health  
U.S. Department of Health and Human Services  
**[www.nih.gov/sigs/bioethics/](http://www.nih.gov/sigs/bioethics/)**
- ⇒ University of Pennsylvania Center for Bioethics  
**[www.bioethics.upenn.edu](http://www.bioethics.upenn.edu)**
- ⇒ Snyder L, Leffler C, Ethics and Human Rights Committee, American College of Physicians.  
Ethics manual: fifth edition. *Ann Intern Med.* 2005;142:560-82.
- ⇒ World Medical Association Ethics Unit  
**[www.wma.net/e/ethicsunit/resources.htm](http://www.wma.net/e/ethicsunit/resources.htm)**
- ⇒ Ethics in Medicine University of Washington School of Medicine  
**[eduserv.hscer.washington.edu/bioethics](http://eduserv.hscer.washington.edu/bioethics)**
- ⇒ Program in Ethics In Science and Medicine University of Texas Southwestern Medical Center  
**[www3.utsouthwestern.edu/ethics/](http://www3.utsouthwestern.edu/ethics/)**
- ⇒ Virtual Mentor American Medical Association  
**[www.ama-assn.org/ama/pub/category/3040.html](http://www.ama-assn.org/ama/pub/category/3040.html)**
- ⇒ Bioethics Interest Group American Medical Student Association  
**[www.amsa.org/bio/index.cfm](http://www.amsa.org/bio/index.cfm)**

## GENERAL CLINICAL CORE COMPETENCIES

### #8 SELF-DIRECTED LEARNING

#### RATIONALE:

Because of the breadth of the problems encountered in clinical practice, internists face an extraordinary challenge to keep up with the burgeoning amount of new information relevant to providing high quality care. Therefore, they must master and practice self-directed life-long learning, including the ability to access and utilize information systems and resources efficiently.

#### PREREQUISITES:

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Basic library skills, including the ability to perform an electronic literature search.
- Critical appraisal skills.
- Understanding of basic concepts of biostatistics and clinical epidemiology including: sensitivity, specificity, positive predictive value, negative predictive value, absolute risk reduction, relative risk reduction, number needed to treat, likelihood/odds ratios, and tests of significance.

#### SPECIFIC LEARNING OBJECTIVES:

A. **KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Key sources for obtaining updated information on issues relevant to the medical management of adult patients. (*MK, PLI*)
2. A system for managing information from a variety of sources. (*MK, PLI*)
3. The concept of the focused clinical question. (*MK, PLI*)
4. Key questions to ask when critically appraising articles on diagnostic tests:
  - Was there an independent, blind comparison with a reference (“gold”) standard? (*MK, PLI*)
  - Was the diagnostic test evaluated in an appropriate spectrum of patients (like those in whom it would be used in practice)? (*MK, PLI*)
  - Was the reference standard applied regardless of the diagnostic test result? (*MK, PLI*)
  - What were the results of the study (e.g. sensitivity, specificity, likelihood ratios, and/or pre- and post-test probabilities)? (*MK, PLI*)
5. Key questions to ask when critically appraising articles on medical therapeutics:
  - Was the assignment of patients to treatments randomized? (*MK, PLI*)
  - Were all patients who entered the trial properly accounted for at the conclusion of the study and analyzed in the group they were randomized to? (*MK, PLI*)
  - Were patients and study personnel blind to the treatment? (*MK, PLI*)
  - Were the groups similar at the start of the trial? (*MK, PLI*)
  - Aside from the experimental intervention, were the groups treated equally? (*MK, PLI*)
  - What were the results of the trial (e.g. relative risk reduction, absolute risk reduction, and “number needed to treat”)? (*MK, PLI*)

B. **SKILLS:** Students should be able to demonstrate specific skills, including:

1. Performing a computerized literature search to find articles pertinent to a focused clinical question. (PLI)
2. Demonstrating critical review skills. (PLI)
3. Reading critically about issues pertinent to their patients. (PLI)
4. Assessing the limits of medical knowledge in relation to patient problems (PLI)
5. Using information from consultants critically. (PLI)
6. Recognizing when additional information is needed to care for the patient (PLI)
7. Asking colleagues (students, residents, nurses, faculty) for help when needed (PLI, SBP)
8. Making use of available instruments to assess one's own knowledge base (PLI, P)
9. Summarizing and presenting to colleagues what was learned from consulting the medical literature. (PLI, CS)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate self-directed learning in every case. (PLI, P)
2. Acknowledge gaps in knowledge to both colleagues and patients and request help. (PLI, P)
3. Seek feedback regularly and respond appropriately and productively. (P)
4. Recognize the value and limitations of other health care professionals when confronted with a knowledge gap. (PLI, P, SBP)

**D. REFERENCES:**

- ⇒ Users' guides to the medical literature. I. How to get started. The Evidence-Based Medicine Working Group. *JAMA*. 1993;270:2093-5.
- ⇒ Users' guides to the medical literature. II. How to use an article about therapy or prevention. A. Are the results of the study valid? Evidence-Based Medicine Working Group. *JAMA*. 1993;270:2598-601.
- ⇒ Users' guides to the medical literature. II. How to use an article about therapy or prevention. B. What were the results and will they help me in caring for my patients? Evidence-Based Medicine Working Group. *JAMA*. 1994;271:59-63.
- ⇒ Users' guides to the medical literature. III. How to use an article about a diagnostic test. A. Are the results of the study valid? Evidence-Based Medicine Working Group. *JAMA*. 1994;271:389-91.
- ⇒ Users' guides to the medical literature. III. How to use an article about a diagnostic test. B. What are the results and will they help me in caring for my patients? The Evidence-Based Medicine Working Group. *JAMA*. 1994;271:703-7.
- ⇒ Strauss SE, Richardson WS, Glasziou P, Haynes RB. *Evidence Based Medicine: How to Practice and Teach EBM*. 3rd ed. New York, NY: Churchill Livingstone; 2005.
- ⇒ Advancing Education in Practice-Based Learning and Improvement An Educational Resource from the ACGME Outcome Project  
[www.acgme.org/outcome/implement/complete\\_PBLIBooklet.pdf](http://www.acgme.org/outcome/implement/complete_PBLIBooklet.pdf)

## GENERAL CLINICAL CORE COMPETENCIES

### #9 PREVENTION

**RATIONALE:**

One of the most important responsibilities of primary care physicians is to promote health and prevent disease in a cost-effective manner. Appropriate care by internists includes not only recognition and

treatment of disease but also the routine incorporation of the principles of preventive health care into clinical practice. All physicians should be familiar with the principles of preventive health care to ensure their patients receive appropriate preventive services.

### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:

- Introductory course in clinical epidemiology and biostatistics.
- Introductory course in health promotion and disease prevention.
- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.

### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Primary, secondary, and tertiary prevention. (*MK*)
2. Criteria for determining whether or not a screening test should be incorporated into the periodic health assessment of adults. (*MK*)
3. General types of preventive health care issues that should be addressed on a routine basis in adult patients (i.e., cancer screening; prevention of infectious diseases, coronary artery disease, osteoporosis, and injuries; and identification of substance abuse). (*MK*)
4. Vaccines that have been recommended for routine use in at least some adults (i.e., influenza, pneumococcal, measles, mumps, rubella, tetanus-diphtheria, hepatitis). (*MK*)
5. Indications for endocarditis prophylaxis. (*MK*)
6. Methods for counseling patients about risk-factor modification, including the “stages of change” approach to helping patients change behavior. (*MK*)
7. Influence of age and clinical status on approach to prevention. (*MK*)
8. General categories of high-risk patients in whom routine preventative health care must be modified or enhanced (e.g., family history, travel to an underdeveloped area, occupational exposures, etc.). (*MK*)
9. The major areas of controversy in screening. (*MK*)
10. The potential roles and limitations of genetic testing in disease prevention/early detection. (*MK*)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Obtaining a patient history, including a detailed family history, vaccination history, travel history, sexual history, and occupational exposures. (*PC*)
2. Identifying patients at high risk for developing diabetes, dyslipidemia, coronary artery disease, cancer, osteoporosis, influenza, pneumonia, hepatitis, HIV infection, and tuberculosis by screening for major risk factors. (*PC*)
3. Obtaining a Pap smear and interpreting its results. (*PC*)
4. Performing a breast examination. (*PC*)
5. Instructing patients to perform breast self-examination. (*PC, CS*)
6. Interpreting the results of a mammogram. (*PC*)
7. Performing a digital rectal examination. (*PC*)
8. Interpreting the results of a PSA test and understand its limitations. (*PC*)
9. Performing a testicular examination. (*PC*)
10. Interpreting the results of a bone densitometry test. (*PC*)
11. Interpreting the results of a fasting lipid profile. (*PC*)



12. Interpreting the results of a fasting glucose test. (PC)
13. Counseling patients about safe-sex practices, smoking cessation, alcohol abuse, weight loss, healthy diet, exercise, and seat belt use. (PC, CS)
14. place and interpret a PPD. (PC)
15. Locating recently published recommendations as well as original data regarding measures that should be incorporated into the periodic health assessment of adults. (PLI)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Address preventive health care issues as a routine part of their assessment of patients. (P)
2. Encourage patients to share responsibility for health promotion and disease prevention. (P)
3. Recognize the importance of patient preferences when recommending preventive health measures. (P)
4. Understand the patient's right to refuse preventive health measures. (P)
5. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection preventive health measures. (PLI, P)
6. Demonstrate ongoing commitment to self-directed learning regarding preventive health measures. (PLI, P)

**D. REFERENCES:**

- ⇒ Pomrehn PR, Davis MV, Chen DW, Barker W. Prevention for the 21st century: setting the context through undergraduate medical education. *Acad Med.* 2000;75(7 Suppl):S5-13.
- ⇒ Guide to Clinical Preventive Services  
U.S. Preventative Services Task Force (USPSTF)  
Agency for Healthcare Research and Quality  
U.S. Department of Health and Human Services  
USPSTF Recommendation: Screening for Cancer  
**[www.ahrq.gov/clinic/cps3dix.htm#cancer](http://www.ahrq.gov/clinic/cps3dix.htm#cancer)**  
USPSTF Recommendation: Screening for Lipid Disorders  
**[www.ahrq.gov/clinic/ajpmsuppl/lipidrr.htm](http://www.ahrq.gov/clinic/ajpmsuppl/lipidrr.htm)**  
USPSTF Recommendation: Screening for High Blood Pressure  
**[www.ahrq/clinic/3rduspstf/highbloodsc/hibloodrr.htm](http://www.ahrq/clinic/3rduspstf/highbloodsc/hibloodrr.htm)**  
USPSTF Recommendations Statement: Counseling to prevent tobacco use and tobacco-caused disease  
**[www.ahrq.gov/clinic/3rduspstf/tobaccoun/tobcounrs.htm](http://www.ahrq.gov/clinic/3rduspstf/tobaccoun/tobcounrs.htm)**
- ⇒ Screening for Prostate Cancer. American College of Physicians. *Ann Int Med* 1997; 126: 480-484.
- ⇒ Summary of Recommendations for Adult Immunization Immunization Action Coalition Bulletin Adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP), August 2005  
**[www.immunize.org/acip](http://www.immunize.org/acip)**
- ⇒ Martin GJ. Screening and prevention of disease. In Kasper DL, Braunwald EB, Fauci AS, Hauser SL, Longo DL, and Jameson JL eds. *Harrison's Principles of Internal Medicine*. 16th ed. New York, NY: McGraw-Hill; 2005:26-28.

## GENERAL CLINICAL CORE COMPETENCIES

### #10 COORDINATION OF CARE

#### **RATIONALE:**

The task of coordinating a patient's care is central to the role of the internist, and involves communication with the patient and his or her family, colleagues, consultants, nurses, social workers, and community-based agencies. It is essential for the student to learn that the physician's responsibility toward the patient does not stop at the end of the office visit or hospitalization but continues in collaboration with other professionals to ensure that the patient receives optimal care.

#### **PREREQUISITES:**

- Prior knowledge, skills, and attitudes acquired during the pre-clinical experience should include:
- Ability to perform patient-centered interviewing to determine the patients' needs and communicate about diagnostic and therapeutic plans, transitions of care, and end-of-life care.
- Ability to identify community resources for care and strategies for coordination of care.
- Health Information Portability and Accountability Act (HIPAA) training to promote patient privacy.
- Required introductory courses in interviewing/physical examination with emphasis on doctor-patient communication and health care delivery.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe and discuss:

1. The role of consultants and their limits in the care of a patient. (*MK, SBP*)
2. Key personnel and programs in and out of the hospital that may be able to contribute to the ongoing care of an individual patient for whom the student has responsibility (e.g. home health providers, social workers, case coordinators/managers, community health organizations, etc.). (*MK, SBP*)
3. The role of the primary care physician in coordinating the comprehensive and longitudinal patient care plan, including communicating with the patient and family (directly, telephone, or email) and evaluating patient well-being through home health and other care providers. (*MK, SBP*)
4. HIPAA guidelines to promote patient privacy. (*MK, SBP*)
5. The role of the primary care physician in the coordination of care during key transitions (e.g. outpatient to inpatient, inpatient to skilled nursing facility, inpatient to hospice, etc.). (*MK, SBP*)
6. The role of clinical nurse specialists, nurse practitioners, physicians assistants, and other allied health professionals in co-managing patients in the outpatient and inpatient setting. (*MK, SBP*)
7. The importance of reconciliation of medications at all transition points of patient care. (*MK, SBP*)
8. The rationale for a standardized approach to all "hand off" communications (*MK, SBP*)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Discussing with the patient and their family ongoing health care needs; using appropriate language, avoiding jargon, and medical terminology. (*PC, CS*)

2. Participating in requesting a consultation and identifying the specific question to be addressed. (PC, CS, .SBP)
3. Participating in the discussion of the consultant's recommendations. (PC, CS, SBP)
4. Participating in developing a coordinated, ongoing care plan in the community. (PC, SBP)
5. Obtaining a social history that identifies potential limitations in the home setting which may require an alteration in the medical care plan to protect the patient's welfare. (PC, CS)
6. Reconciling patient medications at key transition points in care. (PC, SBP)
7. Conveying accurately vital patient information at all care "hand-off" points (PC, CS, SBP)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate teamwork and respect toward all members of the health care team. (P, SBP)
2. Demonstrate responsibility for patients' overall welfare. (P)
3. Participate, whenever possible, in coordination of care and in the provision of continuity. (P, SBP)

**D. REFERENCES:**

- ⇒ Goldman L, Lee, T, Rudd P. Ten commandments of effective consultation. *Arch Intern Med.* 1983;143:1753-5.
- ⇒ Stille CJ, Jerant A, Bell D, Meltzer D, Elmore JG. Coordinating care across diseases, settings, and clinicians: a key role for the generalist in practice. *Ann Intern Med.* 2005;142:700-708.
- ⇒ Haggerty JL, Reid RJ, Freeman GK, Starfield BH, Adair CE, McKendry R. Continuity of care: a multidisciplinary review. *BMJ.* 2003;327:1219-21.
- ⇒ Wenger NS, Young R. Quality indicators of continuity and coordination of care for vulnerable elder persons. Rand Corporation, 2004.  
**[www.rand.org/pubs/working\\_papers/2004/RAND\\_WR176.pdf](http://www.rand.org/pubs/working_papers/2004/RAND_WR176.pdf)**
- ⇒ Building a Case for Medication Reconciliation Institute for Safe Medication Practices  
**[www.ismp.org/Newsletters/acutecare/articles/20050421.asp](http://www.ismp.org/Newsletters/acutecare/articles/20050421.asp)**
- ⇒ Reconcile Medications at All Transition Points Institute for Healthcare Improvement  
**[www.ihl.org/IHI/Topics/PatientSafety/MedicationSystems/Changes/Reconcile+Medications+at+All+Transition+Points.htm](http://www.ihl.org/IHI/Topics/PatientSafety/MedicationSystems/Changes/Reconcile+Medications+at+All+Transition+Points.htm)**
- ⇒ Healthcare Communications Toolkit to Improve Transitions of Care Department of Defense Patient Safety Program  
**[https://patientsafety.satx.disa.mil/ContentStore/2005\\_12-8%20Handoff%20Toolkit%20FINAL.htm](https://patientsafety.satx.disa.mil/ContentStore/2005_12-8%20Handoff%20Toolkit%20FINAL.htm)**

## GENERAL CLINICAL CORE COMPETENCIES

### #11 GERIATRIC CARE

#### **RATIONALE:**

Geriatric patients often have multiple, chronic illnesses which may present with atypical symptoms. Management strategies need to take into account the effects of aging on multiple organ systems and socioeconomic factors faced by our elderly society. As the number of geriatrics patients steadily rises, the internist will devote more time to the care of these patients.

#### **PREREQUISITES:**

- Required courses in anatomy, physiology, pathophysiology, physical examination, and nutrition with attention to specific considerations in the elderly.
- Ability to perform a complete medical history and physical.
- Ability to communicate with patients of diverse backgrounds.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Functional implications of aging on each major organ system. (MK)
2. Nutritional needs of the elderly and adaptations needed in the presence of chronic illness. (MK)
3. Key illnesses in the elderly, focusing on their often atypical presentation, including:
  - Cardiovascular and cerebrovascular disease. (MK)
  - Diabetes. (MK)
  - Urinary tract infection. (MK)
  - Pneumonia. (MK)
  - Substance abuse. (MK)
  - Depression. (MK)
  - Thyroid disease. (MK)
  - Fluid and electrolyte disturbances. (MK)
  - Arthritis. (MK)
  - Constipation. (MK)
  - Acute abdomen. (MK)
  - Depression. (MK)
4. The common “geriatric syndromes” (i.e. symptoms and conditions common in the elderly and often multifactorial in origin), including:
  - Immobility. (MK)
  - Falls/gait and balance problems. (MK)
  - Dizziness. (MK)
  - Incontinence. (MK)
  - Weight loss/failure to thrive/malnutrition. (MK)
  - Sleep disturbance. (MK)
  - Dementia/delirium. (MK)
  - Osteoporosis. (MK)
  - Hearing and visual impairment. (MK)
  - Pressure ulcers. (MK)

5. Basic treatment plans for illness in the elderly, with an awareness of the pharmacokinetic and pharmacodynamic changes seen as we age. *(MK)*
6. Principles of screening in the elderly, including immunizations, cardiovascular risk, cancer, substance abuse, mental illness, osteoporosis, and functional assessment. *(MK)*
7. Factors that contribute to polypharmacy in the elderly. *(MK)*
8. Principles of Medicare (including who and what services are covered) and prescription drug coverage (who and what drugs are covered). *(MK, SBP)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Taking a complete and focused history from a geriatric patient with attention to current symptoms, chronic illnesses, and physical and mental functioning *(PC, CS)*
2. Always obtaining historical information from collateral source, whenever possible. *(PC, CS)*
3. Performing a physical examination and functional assessment on an elderly patient, adapting it to a patient's symptoms, chronic illness, and possible conditions of frailty, immobility, hearing loss, memory loss, and other impairments. *(PC)*
4. Performing a mental status examination to evaluate confusion and/or memory loss in an elderly patient. *(PC)*
5. Identifying patients at high risk for falling. *(PC)*
6. Developing a diagnostic and management plan for patients with the with symptoms/conditions common in the geriatric population. *(PC, MK)*
7. Communicating the diagnosis, treatment plan, and subsequent follow-up to the patient and their family. *(PC, CS)*
8. Eliciting input and questions from the patient and their family about the diagnostic and management plan. *(PC, CS)*
9. With guidance and direct supervision, participating in discussing basic issues regarding advance directives with patients and their families. *(CS)*
10. With guidance and direct supervision participating in discussing basic end-of-life issues with patients and their families. *(CS)*
11. Actively attempting to limit polypharmacy whenever possible. *(PC)*
12. Participating in an interdisciplinary approach to management and rehabilitation of elderly patients. *(PC, SBP)*
13. Determine when to obtain consultation from a geriatric specialist. *(PC, SBP)*
14. Accessing and using appropriate information systems and resources to help delineate issues related to the common geriatric syndromes. *(PC, PLI)*
15. Incorporating patient needs and preferences. *(PC, P)*

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Respect the increased risk for iatrogenic complications among elderly patients by always taking into account risks and monitoring closely for complications *(P)*
2. Demonstrate respect to older patients, particularly those with disabilities, by making efforts to preserve their dignity and modesty. *(P)*
3. Always treat cognitively impaired patients and patients at the end of their lives with utmost respect and dignity. *(P)*
4. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for the common geriatric syndromes. *(PLI, P)*
5. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for the common geriatric syndromes. *(P)*

6. Demonstrate ongoing commitment to self-directed learning regarding care of the geriatric patient. (*P, PLI*)
7. Appreciate the impact the common geriatric syndromes have on a patient's quality of life, well-being, and the family. (*P*)
8. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in the diagnosis and treatment of geriatric patients. (*P, SBP*)

**D. REFERENCES:**

- ⇒ The American Geriatrics Society  
**[www.americangeriatrics.org/](http://www.americangeriatrics.org/)**  
Guidelines and Position Statements  
**[www.americangeriatrics.org/products/positionpapers/](http://www.americangeriatrics.org/products/positionpapers/)**
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## GENERAL CLINICAL CORE COMPETENCIES

### #12 BASIC PROCEDURES

#### **RATIONALE:**

For many students, the internal medicine clerkship is where the basic procedural skills required in other clerkships, subinternships, and residencies are learned.

#### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Pertinent anatomic considerations, including venous anatomy of the extremities (for venipuncture and IV placement), arterial anatomy of the wrist and groin (for blood gases), vaginal/vulvar anatomy (for urethral catheterization in women as well as pap smear) and prostate anatomy in men (for prostate exam), rectal anatomy (for digital rectal exam) and surface anatomy and electrical vector orientation of the heart (for EKG placement).
- The fundamental tenants of informed consent.
- Basic training in body substance isolation procedures and sterile technique.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Key indications, contraindications, risks to patients and health care providers, benefits, and techniques for each of the following basic procedures:
  - Venipuncture. (MK)
  - Blood culture. (MK)
  - ABG. (MK)
  - ECG. (MK)
  - Chest radiography. (MK)
  - Nasogastric tube placement. (MK)
  - Urethral catheterization. (MK)
  - Peripheral intravenous catheter insertion. (MK)
  - Throat culture. (MK)
  - PAP smear. (MK)
  - Digital rectal examination. (MK)
  - Urine dipstick. (MK)
  - Stool occult blood testing. (MK)
  - Subcutaneous injection. (MK)
  - Intramuscular injection. (MK)
  - Wound culture. (MK)
  - Dressing change. (MK)
  - PPD placement. (MK)
2. Alternatives to a given procedure. (MK)
3. The patient's experience of the procedure. (MK)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Obtaining informed consent, when necessary, for basic procedures, including the explanation of the purpose, possible complications, alternative approaches, and conditions necessary to make the procedure as comfortable, safe, and interpretable as possible. (PC, CS)
2. Explaining what the patient's experience is likely to be in understandable terms. (CS)
3. Demonstrating step-by-step performance of basic procedures with technical proficiency. (PC)
4. Demonstrating proper sterile technique and body substance isolation procedures. (PC)
5. Appropriately documenting, when required, how the procedure was done, any complications, and results. (CS)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Appreciate the fear and anxiety many patients have regarding even simple procedures. (P)
2. Make efforts to maximize patient comfort during a procedure. (P)
3. Appreciate the patient's right to refuse procedures. (P)
4. Regularly seek feedback regarding procedural skills and respond appropriately and productively. (P)

**D. REFERENCES:**

- ⇒ Guide to procedures. In Lin GA, Lin TL, Sakurai KA, De Fer TM, eds. *The Washington Manual Internship Survival Guide*. 2nd ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2005:178-210.
- ⇒ Chen H, Sonneday CJ, Lillemoe KD eds. *Manual of Common Bedside Surgical Procedures*. 2nd ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2000.
- ⇒ Ferri FF. Procedures and interpretation of results. In Ferri FF, ed. *Practical Guide to the Care of the Medical Patient*. 6th ed. St. Louis, MO: Mosby; 2004:903-934.



## GENERAL CLINICAL CORE COMPETENCIES

### #13 NUTRITION

#### **RATIONALE:**

Despite the importance of nutritional factors in health and illness, physicians frequently have been criticized for giving these factors inadequate attention. Internists, by virtue of their dedication to providing comprehensive care to their patients, must assess nutritional factors on a routine basis. Medical students should be prepared to provide patients with basic advice regarding ways to optimize their nutritional status. Students also need to have at least a basic working knowledge of the principles of nutritional assessment and intervention.

#### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Ability to perform a complete medical history.
- Ability to communicate with patients of diverse backgrounds.
- Knowledge of body metabolism, the respective roles of dietary fats, carbohydrates, and protein, and the need for vitamins and minerals for maintenance of health.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Each student should be able to define, describe, and discuss:

1. The relationship between diet and disease. *(MK)*
2. Common medical problems that can cause nutritional deficiencies. *(MK)*
3. Contributions of nutrition to medical problems such as obesity, hyperlipidemia, diabetes, and hypertension. *(MK)*
4. How to perform a nutritional assessment and assist the patient in setting goals for dietary improvement. *(MK)*
5. Daily caloric, fat, carbohydrate, protein, mineral, and vitamin requirements; adequacy of diets in providing such requirements; evidence of need for and potential risks of supplements (e.g. calcium, antioxidants). *(MK)*
6. Common dietary supplements and their known adverse and beneficial effects on health. *(MK)*
7. The consequences of poor nutrition on a critically ill patient, such as poor wound healing, increased risk of infection, and increased mortality. *(MK)*
8. Nutritional needs of the elderly and adaptations needed in the presence of chronic illness. *(MK)*
9. The indications for enteral and parenteral nutrition. *(MK)*

**B. SKILLS:** Student should be able to demonstrate specific skills, including:

1. Obtaining a nutritional history for all patients, with additional focus on those with chronic disease (obesity, hyperlipidemia, diabetes mellitus, hypertension, alcoholism, cancer, COPD, CHF, renal, and GI disease), giving attention to weight change, appetite, eating habits, digestive problems, dental problems, physical handicaps, psychiatric problems, socioeconomic factors, alcohol use, medications, and physical activity. *(PC, CS)*
2. Identifying physical exam abnormalities that may suggest malnutrition, such as muscle wasting, decreased adipose stores, as well as stigmata of vitamin/mineral or protein-calorie

malnutrition (e.g. alopecia, ecchymoses, angular chelosis, glossitis, peripheral neuropathy, edema, etc.). (PC)

3. Calculating a patient's body mass index (BMI) and measuring waist circumference. (PC)
4. Ordering appropriate tests for evaluating a patient's nutritional status, including albumin, prealbumin, serum chemistries and coagulation profile(PC)
5. Performing basic nutritional counseling with patients with obesity, diabetes mellitus, hyperlipidemia, hypertension, heart failure, and coronary artery disease. (PC, CS)
6. Identifying barriers that prevent a patient from successfully adhering to a recommended diet. (PC, CS)
7. Determining when to obtain consultation from a dietician. (PC, SBP)
8. Incorporating patient needs and preferences. (PC, P)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for malnutrition. (PLI, P)
2. Recognize the importance of patient preferences and cultural factors when selecting nutritional counseling. (PLI, P)
3. Respond to patients who are non-adherent to recommendations for appropriate nutritional intake. (CS, P)
4. Demonstrate ongoing commitment to self-directed learning regarding nutrition. (PLI, P)
5. Appreciate the impact malnutrition has on a patient's quality of life, wellbeing, ability to work, and the family. (P)
6. Recognize the importance of involving other healthcare professionals when appropriate. (P, SBP)

**D. REFERENCES:**

- ⇒ Division of Nutrition and Physical Activity National Center for Chronic Disease Prevention and Health Promotion  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/nccdphp/dnpa/](http://www.cdc.gov/nccdphp/dnpa/)**
- ⇒ Dietary Guidelines for Americans  
U.S. Department of Agriculture  
U.S. Department of Health and Human Services  
**[www.health.gov/dietaryguidelines/](http://www.health.gov/dietaryguidelines/)**
- ⇒ American Dietetic Association  
**[www.eatright.org](http://www.eatright.org)**
- ⇒ Food and Nutrition Information Center  
U.S. Department of Agriculture  
**[www.nal.usda.gov/fnic/](http://www.nal.usda.gov/fnic/)**
- ⇒ Dwyer J. Nutritional requirements and dietary assessment. In Kasper DL, Braunwald EB, Fauci AS, Hauser SL, Longo DL, Jameson JL eds. *Harrison's Principles of Internal Medicine*. 16th ed. New York, NY: McGraw-Hill; 2005:399-403.
- ⇒ Halsted CH. Malnutrition and nutritional assessment. In Kasper DL, Braunwald EB, Fauci AS, Hauser SL, Longo DL, Jameson JL eds. *Harrison's Principles of Internal Medicine*. 16th ed. New York, NY: McGraw-Hill; 2005:411-415.
- ⇒ Howard L. Enteral and parenteral nutrition therapy. In Kasper DL, Braunwald EB, Fauci AS,

Hauser SL, Longo DL, Jameson JL eds. *Harrison's Principles of Internal Medicine*. 16th ed. New York, NY: McGraw-Hill; 2005:415-422.

## GENERAL CLINICAL CORE COMPETENCIES

### #14 COMMUNITY HEALTH CARE

#### **RATIONALE:**

The increasing number of physicians practicing under managed care and in community-oriented primary care practices necessitates expanding medical education to prepare graduates for population-based clinical practice. In a managed care setting, population-based clinical practice includes the health of an enrolled population. In a community-based setting, population-based clinical practice includes the health of a population in addition to the health of the individual patient through concern with resource allocation, epidemiology, and the care of patients whose needs are not currently met by the health care system.

#### **PREREQUISITES:**

- Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:
- Required introductory coursework in health care delivery (with an emphasis on medical sociology and health care delivery to at risk populations).
- Required introductory course in clinical epidemiology and biostatistics.
- Required introductory coursework in population health (with an emphasis on differences between individuals and populations).

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The concepts of rate, incidence, and prevalence to characterize the health of a population. *(MK)*
2. How to gather health information about a population. *(MK)*
3. How disease epidemiology in a community differs from that experienced in an office or hospital practice. *(MK)*
4. How health care financing and health care delivery systems affect individual physicians, patients, and communities. *(MK, SBP)*
5. How community and individual responses to health problems may be affected by both individual and community socio-cultural characteristics. *(MK)*
6. Local government, social service, or community organizations that provide links between the underserved members of the community and the medical care systems. *(MK, SBP)*
7. barriers faced by his or her patients in the community setting. *(MK)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Defining and describing a population, its demography, culture, socioeconomic makeup, and health status. *(PC)*
2. Identifying the unique characteristics of a population that affect the health of the population and individuals within that population. *(PC)*
3. Considering how the socio-cultural characteristics of a particular community may affect that population's attitudes toward health care. *(PC)*
4. Using, in daily patient care, an understanding of the community and sociocultural context that may affect an individual patient's health care decisions and health-related behaviors. *(PC)*

5. Identifying patients whose illnesses may put the community at risk. (PC, MK)
6. Incorporating a population-based perspective in analyzing clinical problems (PC)
7. Reading critically clinical studies and applying findings to health care decisions involving real patients and populations of patients. (PC, MK, PLI)
8. Incorporating principles of disease prevention and behavioral change appropriate for specific populations of patients within a community. (PC, MK)
9. Attempting to develop solutions for barriers to health care delivery (e.g. sociocultural, financial, and system-based) that affect individual patients. (PC, SBP)
10. Functioning effectively as a member of a health care team. (PC, P, SBP)
11. Using, when appropriate, local government, social service, and community organizations to improve the health of individuals and populations. (PC, SBP)
12. Accessing and utilizing appropriate information systems and resources to help delineate issues related to population health. (PC, PLI)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate respect for cultural and socioeconomic diversity. (P)
2. Show willingness to accept at least partial responsibility for the health of populations. (P)
3. Respond non-judgmentally to an individual whose socio-cultural and community-based background result in seemingly counterproductive health care decisions and health-related behaviors. (P)
4. Value the unique contributions of all members of the health care team. (P)
5. Demonstrate ongoing commitment to self-directed learning regarding population/community health issues. (PLI, P)

**D. REFERENCES:**

- ⇒ Contemporary Issues in Medical Education: Quality of Care  
Medical Informatics and Population Health, June, 1998  
American Association of Medical Colleges  
[www.aamc.org/meded/msop/msop2.pdf](http://www.aamc.org/meded/msop/msop2.pdf)
- ⇒ Population Health Forum  
University of Washington  
School of Public Health and Community Medicine  
[depts.washington.edu/eqhlth/index.htm](http://depts.washington.edu/eqhlth/index.htm)
- ⇒ Behavioral Risk Factor Surveillance System Division of Adult and Community Health National  
Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and  
Prevention  
U.S. Department of Health and Human Services  
[www.cdc.gov/brfss/index.htm](http://www.cdc.gov/brfss/index.htm)
- ⇒ Healthy People 2010 National Center for Health Statistics  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
[www.cdc.gov/nchs/hphome.htm](http://www.cdc.gov/nchs/hphome.htm)
- ⇒ Rhyne RL, Bogue R, Kukulka G, Fulmer H, eds. *Community-Oriented Primary Care: Health  
Care for the 21st Century*. Washington, DC: American Public Health Association; 1998.
- ⇒ Strelnick AH. Community-oriented primary care: the state of an art. *Arch Fam Med*.  
1999;8:550-2.
- ⇒ Fox DM. The relevance of population health to academic medicine. *Acad Med*. 2001;76:6-7.
- ⇒ Kindig D, Stoddart G. What is population health?. *Am J Public Health*. 2003;93:380-3.

## GENERAL CLINICAL CORE COMPETENCIES

### #15 CONTINUOUS IMPROVEMENT IN SYSTEMS OF MEDICAL PRACTICE

#### **RATIONALE:**

In the past clinical education had emphasized the role of the physician as an individual decision maker. Problems with cost and quality of care had usually been attributed to errors in individual decision making. In recent years, it has become clear that the individual does not function in isolation but within the context of a health care system and a health care team whose structure ranges from simple to complex. The way the system functions is critical to achieving high quality patient care, ensuring patient safety, reducing sources of errors in medicine, and promoting an environment that respects disclosure without blame. Furthermore, we have begun to focus on the patient as the center of the health care delivery system and to assess quality from the perspectives of the patient and the physician. With the patient as the center of the health care delivery system, the physician becomes a collaborative partner with other health professionals who share a common goal of providing safe, accessible, high quality, evidence-based care.

#### **PREREQUISITES:**

Prior knowledge, skills and attitudes acquired during the pre-clerkship experience should include:

- Required introductory course in clinical epidemiology and biostatistics.
- Required introductory course in health care delivery.
- Required introductory course in bioethics and professionalism.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. The concept of systems-based practice. (*MK, SBP*)
2. How patient care is affected by other professionals, organizations, and society. (*MK, SBP*)
3. The principles of clinical quality improvement, including the notion of variation in practice as a quality issue and the concept of medical care as a process which can be studied and improved. (*MK, SBP*)
4. The analysis and improvement of systems to address common quality problems (e.g., treatment delays, medication errors, failure to use evidence-based diagnostics/treatments, failure to provide preventive care, etc.). (*MK, SBP*)
5. Principles of medical record organization in both inpatient and ambulatory settings. (*MK, SBP*)
6. The importance of complete medical documentation in the context of measuring quality of care, avoiding redundancy, preventing medical errors, and improving patient safety. (*MK, SBP*)
7. The need for a multidimensional approach to the assessment of quality, including the patient's perspective of quality. (*MK, SBP*)
8. The relationship of quality and cost in health care from the standpoint of the individual, health care systems, and society. (*MK, SBP*)
9. Major health care safety concerns (e.g., medication errors, wrong-site procedures, patient misidentification, miscommunication among health care givers, nosocomial infections, falls, use of restraints, etc.). (*MK, SBP*)
10. Potential benefits and pitfalls of critical pathways/practice guidelines intended to improve the quality of care. (*MK, SBP*)
11. Basic organizational structures and financing streams of the U.S. health care system. (*MK, SBP*)

12. The fundamentals of the various type of health insurance (e.g., fee-for-service, preferred provider organization, health maintenance organization, point-of-service). (*MK, SBP*)
13. The fundamentals of Medicare and Medicaid. (*MK, SBP*)

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Using hospital-based support systems to assist in making clinical decisions (e.g., antibiotic control program, critical pathways/practice guidelines, etc.). (*PC, PLI, SBP*)
2. Recognizing system flaws in the delivery of care (e.g., inability to arrange a post-discharge appointment within a needed time frame, delays in obtaining test results, inaccessibility of medical records, etc.). (*SBP*)
3. Using patient education materials to facilitate patients' participation in their own care. (*CS, SBP*)
4. Using the medical records system efficiently to produce medical notes that communicate information clearly. (*PC, CS, SBP*)
5. Maintaining accurate documentation of preventive health measures. (*PC, CS, SBP*)
6. Working collaboratively with other health professionals in the delivery of quality care. (*PC, P, SBP*)
7. Assessing the patients' needs from the standpoint of the individual, family, and community. (*PC, SBP*)
8. Identifying resource available to patients within the health care system. (*PC, SBP*)
9. Reporting patient safety concerns and medical errors to the appropriate individuals. (*CS, SBP*)
10. Using resources, appropriate information systems, and the tenants of evidence-based medicine to assess systems-based practice issues. (*PLI, SBP*)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Recognize the importance of systems, particularly inter-professional collaboration, in delivering high quality patient care. (*P, SBP*)
2. Strive to improve the timeliness diagnostic and therapeutic decision making in order to improve quality of care, increase patient satisfaction, and reduce health care costs. (*PLI, P, SBP*)
3. View the patient as the center of the health care delivery system. (*P, SBP*)
4. Advocate for patients in the health care system. (*P, SBP*)
5. Appreciate that medical error prevention and patient safety are the responsibility of all health care providers and systems and accept the appropriate degree of responsibility at the medical student level. (*P, SBP*)
6. Appreciate the importance teamwork in delivering high quality care. (*P, SBP*)
7. Respect other health care professionals as colleagues on a patient-centered health delivery team and as mutual contributors to high quality patient care. (*P, SBP*)

**D. REFERENCES:**

**GENERAL:**

- ⇒ Agency for Healthcare Research and Quality  
U.S. Department of Health and Human Services  
[ahrq.gov](http://ahrq.gov)

**QUALITY OF CARE:**

- ⇒ Institute for Healthcare Improvement

**[www.ihl.org/ihl](http://www.ihl.org/ihl)**

⇒ Crossing the Quality Chasm: A New Health System for the 21st Century  
Committee on Quality Health Care in America  
Institute of Medicine  
National Academies Press, 2001

⇒ National Committee for Quality Assurance

**[www.ncqa.org](http://www.ncqa.org)**

⇒ National Guideline Clearing House  
Agency for Healthcare Research and Quality  
U.S. Department of Health and Human Services  
**[www.guideline.gov](http://www.guideline.gov)**

**MEDIAL ERRORS AND PATIENT SAFETY:**

⇒ To Err Is Human: Building a Safer Health System  
Institute of Medicine

**[www.iom.edu/?id=4117&redirect=0](http://www.iom.edu/?id=4117&redirect=0)**

⇒ Patient Safety Network  
Agency for Healthcare Research and Quality  
U.S. Department of Health and Human Services

**[psnet.ahrq.gov](http://psnet.ahrq.gov)**

⇒ National Patient Safety Foundation

**[www.npsf.org](http://www.npsf.org)**

⇒ Facts About Patient Safety  
Joint Commission on Accreditation of Healthcare Organizations  
**[www.jcaho.org/accredited+organizations/patient+safety/facts+about+patient+safety.htm](http://www.jcaho.org/accredited+organizations/patient+safety/facts+about+patient+safety.htm)**

**HEALTH INSURANCE AND FINANCE:**

⇒ Understanding Managed Care  
Institute for Health Care Studies  
Michigan State University  
**[www.ihcs.msu.edu/modules/UMC2003/UMC2003.pdf](http://www.ihcs.msu.edu/modules/UMC2003/UMC2003.pdf)**

⇒ The Official U.S. Government Site for People with Medicare  
U.S. Department of Health and Human Services  
**[www.medicare.gov](http://www.medicare.gov)**

⇒ Checkup on Health Insurance Choices  
Agency for Healthcare Research and Quality  
**[www.ahrq.gov/consumer/insuranc.htm](http://www.ahrq.gov/consumer/insuranc.htm)**



## GENERAL CLINICAL CORE COMPETENCIES

### #16 OCCUPATIONAL HEALTH CARE

#### **RATIONALE:**

Despite increasing recognition of the health hazards found in living and working environments, physicians have traditionally received little formal training in the assessment and management of occupational and environmental health problems.

#### **PREREQUISITES:**

- Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:
- Required introductory course work in clinical epidemiology and biostatistics.
- Required introductory course work in the fundamental principles of public health.
- Ability to perform a complete medical history and physical exam.
- Ability to communicate with patients of diverse backgrounds.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Each student should be able to define, describe, and discuss :

1. Common environmental diseases that are likely to be encountered by an internist and the principal etiologic agents associated with them. *(MK)*
2. Pathogenesis of specific occupational diseases and the types of risks that may be encountered in the home or at the work site:
  - Musculoskeletal/ergonomic or “repetitive stress” disorders (e.g. low back pain, carpal tunnel syndrome, etc.). *(MK)*
  - Work related lung disorders (e.g. occupational asthma, particulate inhalation, etc.). *(MK)*
  - Noise related hearing loss. *(MK)*
  - Skin disorders (e.g. latex allergy and other forms of occupational dermatitis). *(MK)*
  - Infectious disease exposure (e.g. hepatitis, HIV, TB, etc.). *(MK)*
  - Psychological/stress related disorders *(MK)*
3. Information sources for determining the risk of specific environmental and occupational health hazards. *(MK)*
4. Purpose of Occupational Safety and Health Act (OSHA) regulations and the function of the National Institute for Occupational Safety and Health. (NIOSH). *(MK, SBP)*

**B. SKILLS:** Students should be able to demonstrate specific skills, including:

1. Obtaining an appropriate occupational history on all patients and identifying those patients whose health may have been adversely affected by their living conditions or work environment. *(PC, CS)*
2. Considering the possibility that the patient’s illness may be related to their home or work environment. *(PC)*
3. Providing patients with sound advice on the prevention of occupational and environmental-related diseases. *(PC, CS)*
4. Accurately diagnosing and developing a cost-effective basic management plan for common occupational health problems (e.g. carpal tunnel syndrome, asthma, asbestosis). *(PC, MK, SBP)*

5. Determining when to obtain consultation from an environmental and occupational medicine specialist. (*PC, SBP*)
6. Accessing and utilizing appropriate information systems and resources to help delineate issues related to occupational health problems. (*PC, PLI*)

**C. ATTITUDES AND PROFESSIONAL BEHAVIORS:** Students should be able to:

1. Demonstrate an understanding that physicians have a duty and professional responsibility to follow-up on conditions that are suspected of causing occupational or environmental-related illnesses. (*P, SBP*)
2. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of diagnostic and therapeutic interventions for occupational health problems. (*PLI, P*)
3. Recognize the importance of patient needs and preferences when selecting among diagnostic and therapeutic options for occupational health problems. (*P*)
4. Demonstrate ongoing commitment to self-directed learning regarding occupational health problems. (*PLI, P*)
5. Appreciate the impact occupational health problems have on a patient's quality of life, well-being, ability to work, and the family. (*P*)
6. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in the diagnosis and treatment of occupational health problems. (*P, SBP*)

**D. REFERENCES:**

- ⇒ Occupational Safety and Health Administration  
U.S. Department of Labor  
**[www.osha.gov](http://www.osha.gov)**
- ⇒ National Institute for Occupational Safety and Health  
Centers for Disease Control and Prevention  
U.S. Department of Health and Human Services  
**[www.cdc.gov/niosh/homepage.html](http://www.cdc.gov/niosh/homepage.html)**

## GENERAL CLINICAL CORE COMPETENCIES

### #17 ADVANCED PROCEDURES

#### **RATIONALE:**

A number of advanced procedures may be performed by general internists, and occasionally third-year medical students under their supervision. In either case, knowledge of the key indications, contraindications, risks, and benefits of these procedures is essential for high quality patient care. Physicians, regardless of specialty, must be able to explain to their patients, in understandable terms, what will be experienced during a procedure.

#### **PREREQUISITES:**

Prior knowledge, skills, and attitudes acquired during the pre-clerkship experience should include:

- Pertinent anatomic considerations, including vascular anatomy of the extremities, wrist/hand, neck, subclavian area and groin.
- Pertinent anatomic landmarks important for the safe performance of thoracentesis, paracentesis, lumbar puncture, and arthrocentesis.
- Required introductory course in interviewing and physical examination.
- The fundamental tenants of informed consent.
- Basic training in body substance isolation procedures and sterile technique.

#### **SPECIFIC LEARNING OBJECTIVES:**

**A. KNOWLEDGE:** Students should be able to define, describe, and discuss:

1. Key indications, contraindications, risks, benefits, techniques of each of the following advanced procedures:
  - Arthrocentesis. (MK)
    - o Elbow (olecranon bursa). (MK)
    - o Wrist. (MK)
    - o Knee. (MK)
    - o Ankle. (MK)
  - Central venous catheterization. (MK)
    - o Internal jugular vein. (MK)
    - o Subclavian vein. (MK)
    - o Femoral vein. (MK)
  - Arterial line placement. (MK)
    - o Radial artery. (MK)
    - o Femoral artery. (MK)
  - Lumbar puncture. (MK)
  - Thoracentesis. (MK)
  - Paracentesis. (MK)
2. Potential alternatives to the listed procedures. (MK)
3. The patient's probable experience during these procedures. (MK)
4. Indications for and efficacy of intra-articular corticosteroid injections. (MK)

**B. SKILLS:** Each student should be able to demonstrate specific skills, including:

1. Participating in obtaining informed consent for advanced procedures, including the explanation of the purpose, possible complications, alternative approaches, and conditions necessary to make the procedure as comfortable, safe, and interpretable as possible. (PC, CS)
2. Explaining the patient's probable experience during the procedure in understandable terms. (PC, CS)
3. Helping to position the patient and make them as comfortable as possible during the procedure. (PC)
4. Assisting (**under supervision, when appropriate**) in the performance of the procedure. (PC)
5. Demonstrating proper sterile technique and body substance isolation procedures. (PC)
6. Appropriately documenting, when required, how the procedure was done as well as any complications and results. (CS)
7. Ordering and interpreting appropriate diagnostic tests on fluids removed from the patient (e.g. synovial fluid, cerebrospinal fluid, pleural fluid, and ascitic fluid). (PC, MK)

**C. ATTITUDES AND PROFESSIONAL BEHAVIOR:** Students should be able to:

1. Demonstrate commitment to using risk-benefit, cost-benefit, and evidence-based considerations in the selection of procedures to be performed. (PLI, P)
2. Appreciate the fear and anxiety many patients have regarding these procedures. (P)
3. Make efforts to maximize patient comfort during a procedure. (P)
4. Appreciate the patient's right to refuse procedures. (P)
5. Seek feedback regularly regarding procedural skills and respond appropriately and productively. (P)

**D. REFERENCES:**

- ⇒ Guide to procedures. In Lin GA, Lin TL, Sakurai KA, De Fer TM, eds. *The Washington Manual Internship Survival Guide*. 2nd ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2005:178-210.
- ⇒ Chen H, Sonneday CJ, Lillemoe KD eds. *Manual of Common Bedside Surgical Procedures*. 2nd ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2000.
- ⇒ Ferri FF. Procedures and interpretation of results. In Ferri FF, ed. *Practical Guide to the Care of the Medical Patient*. 6th ed. St. Louis, MO: Mosby; 2004:903-934.