

CORE MEDICINE CLERKSHIP CURRICULUM GUIDE

A RESOURCE FOR EDUCATORS

Version 4.0
2020

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INTRODUCTION

CDIM CORE MEDICINE CLERKSHIP CURRICULUM GUIDE, 4TH EDITION

We are pleased to offer the new edition of the CDIM Core Medicine Clerkship Curriculum Guide for our membership

In 2018, we conducted a needs assessment of CDIM members regarding the preferred content and structure of the revised curriculum. The results showed that most clerkship directors intend to use the curriculum to identify core clerkship topics, to plan learning activities, and to inform Deans and other local decision makers. We are also aware that the NBME may use the curriculum to guide future changes in the Subject Exam.

Given these intended uses of the Curriculum, we decided to describe the core knowledge students should gain on their Medicine Clerkship, and we intentionally limited each topic to the basic and most important information. At your institution, you can decide how the Curriculum fits into the larger context of both your Medicine Clerkships as well as other clerkships. This should serve as a guide, not a mandate. The primary audience for the Curriculum is clerkship directors and not students.

The structure of the final curriculum follows prior editions and includes sections on Clinical Conditions and Presentations (Part I), such as heart failure and dyspnea, and Core Competencies (Part II), such as history taking and diagnostic decision making.

Part I and Part II topics were decided by consensus among CDIM members.

For Part I topics, we surveyed CDIM list serv members in 2018 and asked respondents to rank the importance of inpatient and outpatient topics. We selected topics where more than 50% of the 86 respondents agreed that the topic “should be taught in all cases”.

Part II topics were decided in a similar manner. We surveyed CDIM listserv members in 2019 and asked respondents (n = 100) to rank the importance of core competency topics. Based on the responses, we categorized competencies as:

- A. Category A: A majority responded that student competence and ability should be assessed.
- B. Category B: A majority/plurality responded that students should be provided opportunities to practice this competency, and the majority of the remaining responded that students should be assessed.
- C. Category C: A majority/plurality responded that students should be provided opportunities to practice this competency, and the majority of the remaining responded that students should be introduced to this competency.
- D. Category D: A majority responded that students should be introduced to this competency.

How can you help?

Review topics and use them in your clerkship to identify core topics, plan learning activities, and inform your institution’s decision-makers about what should be taught on Internal Medicine Clerkships.



DIAGNOSES

ACUTE CORONARY SYNDROME

END OF CLERKSHIP GOALS

Students should be able to explain the etiology, diagnosis, evaluation, treatment, and possible complications of acute coronary syndrome.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, chest pain, dyspnea, nausea/vomiting
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, coronary artery disease, hypertension, dyslipidemia
 - iii. Social history: determine risk factors and predisposing conditions, **e.g.**, tobacco use, cocaine use
 - iv. Family history: assess for risk factors, **e.g.**, premature coronary artery disease, cerebrovascular disease
- b. Perform and interpret key physical exam findings.
 - i. Determine presence and severity of disease, **e.g.**, jugular venous distention, rales/crackles, S4
- c. Identify and interpret key laboratory and imaging testing including indications, benefits, test characteristics, risks/costs of testing.
 - i. Differentiate unstable angina, non-ST-elevation myocardial infarction and ST-elevation myocardial infarction, **e.g.**, cardiac enzymes, ECG, cardiac catheterization
- d. Describe a rational and evidence-based approach to treating a patient with acute coronary syndrome.
 - i. Describe use of reperfusion therapy, **e.g.**, primary percutaneous coronary intervention, thrombolytic therapy
 - ii. Describe use of medical therapy, **e.g.**, anti-platelet therapy, beta- blockers, anticoagulation, lipid therapy, ACE inhibitors
- e. Describe possible complications, **e.g.**, ischemic, mechanical, and arrhythmic complications.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy of the coronary circulation.
- b. Describe the prevalence, etiology, and pathophysiology of ACS.
- c. Describe the pharmacology of antiplatelet agents, thrombolytics, and heparins.

REFERENCES

Bashore TM, Granger CB, Jackson KP, Patel MR. Acute Coronary Syndromes Without ST- Segment Elevation. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Eisen A, Giugliano RP, Braunwald E. Updates on Acute Coronary Syndrome: A Review. *JAMA Cardiol.* 2016; 1(6):718-730.

Timmis A. Acute coronary syndromes. *BMJ.* 2015; 351:h5153.

CHRONIC KIDNEY DISEASE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and prognosis of kidney disease (CKD).

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine status of CKD, **e.g.**, anorexia and fatigue
 - ii. PMH: assess for ongoing risk factors, **e.g.**, diabetes, hypertension, coronary artery disease, nephrotoxic medications
 - iii. SH: assess factors affecting fluid and electrolyte balance, **e.g.**, sodium, potassium, and water intake
- b. Perform and interpret key physical exam findings.
 - i. Assess for ongoing risk factors, **e.g.**, elevated blood pressure
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine stage of chronic kidney disease, **e.g.**, GFR, albuminuria
 - ii. Assess for associated complications, **e.g.**, metabolic acidosis, hyperkalemia, anemia
- d. Describe a rational and evidence-based approach to treatment.
 - i. List factors that slow progression, **e.g.**, smoking cessation, exercise, control of blood pressure
 - ii. Describe avoidance of nephrotoxic agents, **e.g.**, intravenous contrast, gadolinium, NSAIDs
 - iii. Describe when renal replacement therapy or transplantation is indicated, **e.g.**, presence of uremic symptoms
- e. Describe the expected course including possible complications.
 - i. Describe the metabolic consequences of CKD, **e.g.**, anemia, renal osteodystrophy, metabolic acidosis, hyperkalemia

2. Relevant medical knowledge from preclinical instruction

- a. Describe the pathophysiology of CKD and the underlying metabolic consequences.
- b. Describe the mechanisms by which proteinuria and hypertension lead to renal damage and how RAAS blockade mitigates progression.

REFERENCES

- Anders H-J, Davis JM, and Thurau K. Nephron Protection in Diabetic Kidney Disease. *N Engl J Med* 2016; 375: 2096-2098.
- Drawz P and Rahman M. In The Clinic: Chronic Kidney Disease. *Ann Intern Med* 2015; 162(11): ITC 1-16.
- Fishbane S and Spinowitz B. Update on Anemia in ESRD and Earlier Stages of CKD: Core Curriculum 2018. *Am J Kidney Dis* 2018; 71(3): 423-435.
- Kalantar-Zadeh K and Fouque D. Nutritional Management of Chronic Kidney Disease. *N Engl J Med* 2017; 377: 1765-76.
- Moorthi RN and Moe SM. CKD- Mineral and Bone Disorder: Core Curriculum 2011. *Am J Kidney Dis* 2011; 58(6): 1022-1036.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, possible complications, and how to prevent progression of chronic obstructive pulmonary disease (COPD).

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, progressive shortness of breath, chronic cough, sputum production
 - ii. SH: assess for risk factors, **e.g.**, smoke exposure, indoor air pollution, occupational exposure
 - iii. FH: assess for risk factors, **e.g.**, alpha-1 antitrypsin deficiency
- b. Perform and interpret key physical examination findings.
 - i. Assess severity, **e.g.**, air flow, pursed lip breathing, wheezing
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Establish diagnosis and severity, **e.g.**, spirometry, pulmonary function studies, arterial blood gas
 - ii. Assess for alternate and concomitant disorders, **e.g.**, chest radiography
- d. Describe a rational and evidence-based approach to treatment.
 - i. List treatment that improves mortality, **e.g.**, oxygen in hypoxemic patients
 - ii. List treatment that improves symptoms, functional status and reduce exacerbations, **e.g.**, bronchodilators, inhaled anti-inflammatory drugs, pulmonary rehabilitation
 - iii. List treatment of acute exacerbations, **e.g.**, bronchodilators, corticosteroids, antibiotics
 - iv. List treatment that improves lung function, **e.g.**, lung reduction surgery
- e. Describe possible respiratory and cardiac complications, **e.g.**, chronic respiratory failure, cor pulmonale.
- f. Identify factors that slow the decline of respiratory function, **e.g.**, oxygen therapy, smoking cessation.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the lungs.
- b. Describe the prevalence, etiology, and pathophysiology of COPD.

REFERENCES

<https://goldcopd.org/gold-teaching-slide-set/>

Brusselle GG, Joos GF, Bracke KR. New insights into the immunology of chronic obstructive pulmonary disease. *Lancet*. 2011; 378(9795):1015-26.

Chesnutt AN, Chesnutt MS, Prendergast NT, Prendergast TJ. Chronic Obstructive Pulmonary Disease. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill

Lange P, Celli B, Agustí A, et al. Lung-function trajectories leading to chronic obstructive pulmonary disease. *N Engl J Med*. 2015;373(2):111-22.

McDonough JE, Yuan R, Suzuki M, et al. Small-airway obstruction, and emphysema in chronic obstructive pulmonary disease. *N Engl J Med*. 2011; 365(17):1567-75.

CIRRHOSIS

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, prognosis, and possible complications of cirrhosis.

LEARNING OBJECTIVES

1. Patient Care:

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, abdominal distention, jaundice, confusion, gastrointestinal bleeding
 - ii. PMH: determine risk factors and predisposing conditions, **e.g.**, blood transfusions, obesity, autoimmune disease, causative medications
 - iii. Social history: assess for risk factors, **e.g.**, alcohol use disorder, intravenous drug use
 - iv. Family history: determine predisposing diseases, **e.g.**, hemochromatosis, alpha-1 antitrypsin deficiency, Wilsons Disease
- b. Perform and interpret key physical exam findings.
 - i. Determine extent of disease, **e.g.**, ascites, jaundice, spider angiomas, palmar erythema
 - ii. Determine presence of complications, **e.g.**, altered mental status, abdominal distension
- c. Identify and interpret key laboratory and imaging testing including indications, benefits, test characteristics, risks/costs of testing.
 - i. Assess etiology of disease, **e.g.**, viral hepatitis serologies, genetic assay for hemochromatosis, anti-smooth muscle antibody
 - ii. Assess severity of disease, **e.g.**, MELD Score, Fibro-Scan (transient elastography), liver biopsy
 - iii. Assess presence of complications, **e.g.**, peritoneal fluid analysis, esophagogastroduodenoscopy (EGD)
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe treatment of complications, **e.g.**, hepatic encephalopathy, ascites, spontaneous bacterial peritonitis, varices
 - ii. Describe how to prevent decompensation, **e.g.**, avoid NSAIDs, ACE inhibitors
- e. Identify appropriate scoring systems to estimate prognosis, **e.g.**, MELD score, Child-Pugh score.
- f. Describe possible complications, **e.g.**, esophageal varices, hepatocellular carcinoma.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the liver and the portal venous system.
- b. Describe the prevalence, etiology, and pathophysiology of cirrhosis and its complications.

REFERENCES

Ge PS, Runyon BA. Treatment of Patients with Cirrhosis. N Engl J Med. 2016; 375(8): 767-777.

Thomson MJ, Tapper EB, Lok ASF. Dos and Don'ts in the Management of Cirrhosis: A View from the 21st Century. Am J Gastroenterol. 2018; 113(7): 927-931.

CONGESTIVE HEART FAILURE

END OF CLERKSHIP GOALS

Students should be able to describe the evaluation, treatment, prognosis, and possible complications of congestive heart failure.

LEARNING OBJECTIVES:

1. Patient care

- a. Obtain and interpret key historical features.
 - i. HPI: determine presence of decompensation, precipitants, and relevant ROS, **e.g.**, dyspnea, orthopnea, paroxysmal nocturnal dyspnea
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, coronary artery disease, pulmonary hypertension, medication nonadherence
 - iii. SH: assess for ongoing risk factors and causes for decompensation, **e.g.**, tobacco use, dietary or fluid indiscretion
- b. Perform and interpret key physical exam findings.
 - i. Determine presence of decompensation
 - ii. Differentiate right from left sided heart failure, **e.g.**, rales/crackles, presence of S3, peripheral edema
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristic, risks/costs of testing.
 - i. Determine severity, **e.g.**, N-terminal pro-B-type natriuretic peptide
 - ii. Determine underlying etiology, **e.g.**, electrocardiogram, echocardiography
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe initial treatment modalities, **e.g.**, diuretics, ACE inhibitors/ACE receptor blockers, beta-blockers
 - ii. Describe indications for hospitalization based on history or exam
- e. Describe possible complications, **e.g.**, sudden cardiac death.
- f. Describe factors that affect prognosis, **e.g.**, demographics, hospitalization, heart failure etiology.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the cardiac system.
- b. Describe the pathophysiology of right-sided and left-sided heart failure.

REFERENCES

Bashore TM, Granger CB, Jackson KP, Patel MR. Heart Failure. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Wang CS, FitzGerald JM, Schulzer M, Mak E, Ayas NT. Does this dyspneic patient in the emergency department have congestive heart failure? *JAMA*. 2005; 294(15):1944-1956. doi:10.1001/jama.294.15.1944.

Yancy CW, Jessup M, Bozkurt B, et al. 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Failure Society of America. *J Am Coll Cardiol*. 2017; 70(6):776-803.

CORONARY ARTERY DISEASE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, prevention, and possible complications of coronary artery disease.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine status of coronary artery disease, **e.g.**, angina and anginal equivalents
 - ii. PMH: assess for ongoing risk factors, **e.g.**, hypertension, diabetes
 - iii. SH: assess for ongoing risk factors, **e.g.**, tobacco use
- b. Perform and interpret key physical exam findings.
 - i. Assess for ongoing risk factors, **e.g.**, elevated blood pressure
 - ii. Assess for signs of end organ damage, **e.g.**, presence of heart failure
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine presence of ongoing risk factors, **e.g.**, elevated cholesterol
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe long-term treatment, **e.g.**, anti-anginal, anti-platelet and atherosclerotic disease treatment
 - ii. Describe prevention/risk factor modification, **e.g.**, management of medical conditions and health habits
- e. Describe possible complications, **e.g.**, acute coronary syndrome, heart failure.

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the coronary arteries.
- b. Describe the pathophysiology of coronary artery disease.

REFERENCES

2018 ACC/AHA/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol.* 2018; 139: e1082-e1143.

Bashore TM, Granger CB, Jackson KP, Patel MR. Heart Disease: Diagnostic Testing. In: Papadakis MA, McPhee SJ, Rabow MW Eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Bashore TM, Granger CB, Jackson KP, Patel MR. Heart Disease: Symptoms & Signs. In: Papadakis MA, McPhee SJ, Rabow MW Eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

DEMENTIA

END OF CLERKSHIP GOALS:

Students should be able to explain the evaluation, treatment, and possible complications of dementia.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, behavioral changes and time course
 - ii. PMH: assess for risk factors, **e.g.**, prior vascular disease
 - iii. SH: determine risk factors, **e.g.**, substance use, sexual history
- b. Perform and interpret key physical exam findings.
 - i. Assess cognition, **e.g.**, MoCA, SLUMS
 - ii. Screen for neurologic abnormalities, **e.g.**, screening neurological exam
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine underlying cause, **e.g.**, CT, MRI, lumbar puncture
 - ii. Assess for other conditions with similar presentations, **e.g.**, TSH, B12
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe treatments that potentially slow progression, **e.g.**, cholinesterase inhibitors, NMDA receptor agonists
 - ii. Describe treatments to prevent injuries, **e.g.**, home safety assessment
 - iii. Describe treatments to control behavior, **e.g.**, antipsychotics
- e. Describe possible complications, **e.g.**, eating problems, incontinence.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy of the CNS affected by dementia.
- b. Describe the prevalence and pathophysiology of dementia.

REFERENCES

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders 5th edition (American Psychiatric Association, 2013). <https://doi.org/10.1176/appi.books.9780890425596.dsm17>

Dementia. In: Papadakis MA, McPhee SJ, Bernstein J. eds. *Quick Medical Diagnosis & Treatment 2019* New York, NY: McGraw-Hill.

Sanghani PK. Delirium and Dementia. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide 4e* New York, NY: McGraw-Hill.

DEPRESSION

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and expected course of depression.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine symptoms of major depression, **e.g.**, SIGECAPS questions; and relevant ROS, **e.g.**, suicidal ideation
 - ii. HPI: evaluate for other psychiatric diagnoses, **e.g.**, bipolar disorder, anxiety disorders
 - iii. PMH: assess for risk factors, **e.g.**, uncontrolled obstructive sleep apnea, hypothyroidism, associated medications
 - iv. SH: assess for risk factors, **e.g.**, alcohol and other substance use, domestic violence, social isolation
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology, **e.g.**, thyroid exam, findings of Cushing's Syndrome
 - ii. Assess for associated neurologic disorders, **e.g.**, examination for dementia or Parkinson's disease
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine underlying causes for depression, **e.g.**, hypothyroidism, anemia
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe treatment to control symptoms, **e.g.**, psychotherapy, SSRIs and SNRIs
 - ii. Describe when to refer to a psychiatrist, **e.g.**, for worsening symptoms, suicidal ideation, complex medication management
- e. Describe the expected course of depression, **e.g.**, onset to symptom control with medication, typical duration of therapy, frequency of medical visits.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the psychopharmacology of commonly used antidepressants.
- b. Describe the prevalence, etiology, and pathophysiology of depression.

REFERENCES

Park LT and Zarate CA Jr.
Depression in the primary care setting. NEJM. 2019; 380:559

DIABETES MELLITUS

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and complications of diabetes, as well as appropriate screening for diabetes.

LEARNING OBJECTIVES

1. Patient Care:

- a. Obtain, identify, and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, polyuria, visual changes, sensory loss
 - ii. Family history: assess for genetic predisposition
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting complications, **e.g.**, fundoscopic exam, blood pressure, diabetic foot exam
- c. Identify and interpret key laboratory testing and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Assess likelihood and presence of complications, **e.g.**, HgbA1c, BMP, urine microalbumin: creatinine ratio
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe factors that control symptoms and prevent complications, **e.g.**, lifestyle/dietary modifications, medications
 - ii. Describe how to monitor therapy and assess for complications, **e.g.**, HgbA1c monitoring, retinal screening, adherence assessment
 - iii. Describe how to manage common comorbidities, **e.g.**, hypertension, hyperlipidemia, obesity
- e. Describe acute and chronic complications, **e.g.**, hyperosmolar state, diabetic ketoacidosis, macrovascular and microvascular complications.
- f. Describe appropriate screening for diabetes, **e.g.**, who to screen, recommended tests, intervals for testing.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the prevalence, pathophysiology, epidemiology, and risk factors of Type 1 and Type 2 Diabetes Mellitus.
- b. Describe precipitating factors and pathophysiology of DKA and hyperosmolar hyperglycemia syndrome.

REFERENCES

American Diabetes Association. Standards of Medical Care in Diabetes—2019 Abridged for Primary Care Providers. *Clin Diabetes*. 2019; 37(1):11-34.

Fayfman M, Pasquel FJ, Umpierrez GE. Management of hyperglycemic crises: Diabetic ketoacidosis and hyperglycemic hyperosmolar state. *Med Clin North Am*. 2017; 101(3): 587- 606.

Vijan S. In the clinic. Type 2 diabetes. *Ann Intern Med*. 2015; 162(5): ITC1-16.

DYSLIPIDEMIA

END OF CLERKSHIP GOAL

Students should be able to explain the evaluation and treatment of dyslipidemia, as well as appropriate screening for dyslipidemia.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain, identify, and interpret key historical features.
 - i. HPI: assess for secondary causes, **e.g.**, symptoms of hypothyroidism
 - ii. PMH: determine associated risks of vascular disease, **e.g.**, diabetes, causative medications
 - iii. SH: assess for secondary causes, **e.g.**, tobacco use, diet, exercise
 - iv. FH: assess for inherited causes, **e.g.**, familial combined hyperlipidemia
- b. Perform and interpret key physical exam findings.
 - i. Determine associated systemic effects, **e.g.**, xanthomas, decreased peripheral pulses, arterial bruits
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine extent of hyperlipidemia, **e.g.**, fasting lipid panel
 - ii. Determine secondary causes of lipid abnormalities, **e.g.**, fasting glucose, TSH
- d. Describe a rational and evidence-based approach to treatment.
 - i. Use risk calculators to decide on medical treatment, **e.g.**, 10-year and lifetime ASCVD/mortality calculators
 - ii. Counsel patients on lifestyle modification, **e.g.**, diet, exercise, weight loss
 - iii. Describe treatment goals, **e.g.**, LDL levels
 - iv. Describe frequency and type of lab monitoring, **e.g.**, yearly LDL testing, liver enzyme monitoring
- e. Describe a rational and evidence-based approach to screening.
 - i. Use patient characteristics to determine when to begin screening and frequency of screening

2. Relevant medical knowledge from preclinical instruction

- a. Describe the pathophysiology and epidemiology of dyslipidemia.
- b. Describe the pathophysiology of genetic disorders that affect lipid levels.
- c. Describe the pathophysiology by which secondary conditions affect lipid metabolism, **e.g.**, diabetes, alcohol.
- d. Compare and contrast the mechanism of action of five common classes of medications considered in treating dyslipidemias: HMG-CoA Reductase Inhibitors (statins), niacin, bile acid binding resins, and fibric acid derivatives.

REFERENCES

Blaaha MJ, Baron RB. Part 28: Lipid Disorders. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Pignone M, Salazar R. Prevention of Cardiovascular Disease. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

2018 AHA/ACC/AACVPR/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA Guideline on the management of blood cholesterol: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol.* 2019; 73(24): e285- e350.

GASTROESOPHAGEAL REFLUX DISEASE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and possible complications of gastroesophageal reflux disease (GERD).

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine typical, atypical and alarm characteristics and relevant ROS, e.g., heartburn, chest pain, dysphagia
 - ii. PMH: assess for risk factors, e.g., obesity, pregnancy
 - iii. SH: assess for risk factors, e.g., alcohol use, tobacco use
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology or complication, e.g., pulmonary rales, enamel decay
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Use testing to determine presence of alternative diagnoses or complications, e.g., upper endoscopy, esophageal pH monitoring
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe role of non-pharmacological treatment, e.g., weight loss, meal timing, avoiding trigger foods
 - ii. Describe pharmacologic therapy options, e.g., proton pump inhibitors
 - iii. Describe indications and options for surgical management, e.g., laparoscopic fundoplication
- e. Describe possible complications, e.g., esophageal adenocarcinoma, stricture.

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the pulmonary, cardiac, gastrointestinal, neurologic, and musculoskeletal systems.
- b. Describe the prevalence, etiology, and pathophysiology of GERD

REFERENCES

- Badillo R, Francis D. Diagnosis, and treatment of gastroesophageal reflux disease. *World J of Gastrointest Pharmacol Ther.* 2014; 5(3):105-112.
- Harnik IG. In the clinic. Gastroesophageal reflux disease. *Ann Intern Med.* 2015; 163: ITC1.
- Katz PO, Gerson LB, Vela MF. Guidelines for the diagnosis and management of gastroesophageal reflux disease. *Am J Gastroenterol.* 2013; 108(3):308-28.
- Kellerman R, Kintanar T. Gastroesophageal Reflux Disease. *Prim Care.* 2017 Dec;44(4):561-573.
- McQuaid KR. Gastroesophageal Reflux Disease. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.
- Richter JE, Rubenstein JH. Presentation and Epidemiology of Gastroesophageal Reflux Disease. *Gastroenterology.* 2018; 154(2):267-276.

HYPERTENSION

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and possible complications of hypertension.

LEARNING OBJECTIVES

1. Patient care

- a. Obtain and interpret key historical features.
 - i. HPI: assess for symptoms resulting from uncontrolled hypertension, **e.g.**, headaches, visual changes
 - ii. PMH: assess for exacerbating factors or diseases associated with secondary hypertension, **e.g.**, sleep apnea or renal disease
 - iii. SH: assess for ongoing risk factors, **e.g.**, tobacco, drug, alcohol use
- b. Perform and interpret key physical exam findings.
 - i. Classify blood pressure measurement according to current definitions, **e.g.**, Stage 1 or 2 hypertension
 - ii. Compare home and in clinic blood pressure readings
 - iii. Evaluate for end organ effects, **e.g.**, extra heart sounds, reduced peripheral pulses
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Assess for end organ damage, **e.g.**, serum creatinine, urinalysis
 - ii. Assess for comorbidities, **e.g.**, lipid panel, fasting glucose
 - iii. Evaluate for secondary causes, **e.g.**, sleep study
- d. Describe a rational and evidence-based approach to treatment.
 - i. Determine a patient specific blood pressure goal
 - ii. Identify urgent treatment, **e.g.**, IV medications
 - iii. Identify effective lifestyle changes, **e.g.**, weight loss and dietary modifications
 - iv. Identify how to select initial medication(s) based on patient characteristics and comorbidities, **e.g.**, presence of diabetes
- e. Describe possible complications of untreated hypertension, **e.g.**, cerebrovascular, and cardiovascular disease.

2. Medical Knowledge

- a. Describe the prevalence, epidemiology, and risk factors of chronic hypertension.
- b. Describe the pathophysiology of essential hypertension and of secondary causes of hypertension.
- c. Describe mechanisms of action, benefits, risks, and potential side effects of common antihypertensive medications.

REFERENCES

James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: Report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. 2014; 311(5):507–520.

Sutters M. Chapter 11: Hypertension. In: Papadakis MA, McPhee SJ, Rabow MW, eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Weir MR. In the clinic: hypertension. *Ann Intern Med*. 2014; 161(11): ITC1-15.

Whelton PK, Carey RM, Aronow WS, et al. ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: executive summary a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. 2017. *J Am Coll Cardiol* 2018; 71(19):2199-2269.

HYPERTHYROIDISM

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and possible complications of hyperthyroidism.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine status of hyperthyroidism and relevant ROS, **e.g.**, weight loss, palpitations, heat intolerance
 - ii. PMH: assess for risk factors and associated conditions, **e.g.**, atrial fibrillation, osteoporosis
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology, **e.g.**, exophthalmos, thyroid nodule
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine degree of hyperthyroidism, **e.g.**, TSH, free T4, T3
 - ii. Determine underlying etiology, **e.g.**, radioactive iodine uptake
- d. Describe a rational and evidence-based approach to treatment.
 - i. List appropriate initial treatments based on underlying etiology, **e.g.**, radioiodine ablation, thiourea drugs, surgery
 - ii. State how to control symptoms with medications, **e.g.**, beta- blockers, thiourea drugs
- e. Describe possible complications, **e.g.**, ocular, and cardiac complications.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy of the thyroid gland and thyroid hormone physiology and pathophysiology.
- b. Describe of the prevalence, etiology, and pathophysiology of hyperthyroidism.

REFERENCES

Fitzgerald PA. Hyperthyroidism (Thyrotoxicosis). In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill

HYPOTHYROIDISM

END OF CLERKSHIP GOALS

Students should be able to explain evaluation, treatment, and appropriate screening for hypothyroidism.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine status of hypothyroidism and relevant ROS, **e.g.**, constipation, cold intolerance, menstrual irregularities
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, autoimmune disease, infiltrative diseases, neck irradiation
 - iii. FH: assess for family predisposition for thyroid disease
- b. Perform and interpret key physical exam findings.
 - i. Determine presence of findings suggesting an underlying etiology, **e.g.**, thyroid enlargement
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine degree of hyperthyroidism, **e.g.**, TSH, free T4
 - ii. Determine an underlying etiology, **e.g.**, thyroid peroxidase (TPO) antibodies
 - iii. Distinguish a patient with true hypothyroidism from an euthyroid patient with acute illness and abnormal thyroid tests
- d. Describe a rational and evidence-based approach to treatment.
 - i. Treat all hypothyroid patients with levothyroxine (T4)
 - ii. State patient characteristics and comorbidities that factor into levothyroxine dose, **e.g.**, age, coronary artery disease
 - iii. Identify TSH monitoring frequency, **e.g.**, at thyroxine initiation and during maintenance
- e. Describe appropriate screening for hypothyroidism.
 - i. Describe patients at risk for hypothyroidism, **e.g.**, patients with enlarged thyroid glands, autoimmune diseases, head, and neck irradiation
 - ii. Describe screening frequency for patients at risk

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy of the thyroid gland and thyroid hormone physiology and pathophysiology.
- b. Describe the prevalence, etiology, and pathophysiology of hypothyroidism.

REFERENCES

Fitzgerald PA. Hypothyroidism & Myxedema. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill

OSTEOPOROSIS

END OF CLERKSHIP GOALS

Students should be able to explain evaluation, treatment, possible complications, and appropriate screening for osteoporosis.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics of symptoms and relevant ROS, **e.g.**, impaired mobility, falls
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, menopause, hyperthyroidism, malabsorption
 - iii. SH: assess for risk factors, **e.g.**, excessive alcohol use, physical activity, dietary calcium, and vitamin D intake
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology, **e.g.**, exophthalmos, cushingoid appearance, thin hair
- c. Identify and interpret key laboratory and imaging testing and list benefits, test characteristics, risks/costs of testing.
 - i. Test for secondary causes, recommended in selected patients, **e.g.**, calcium, thyroid-stimulating hormone, serum 25-hydroxyvitamin D level
 - ii. Assess for progression, **e.g.**, dual-energy x-ray absorptiometry (DEXA) scan
- d. Describe a rational and evidence-based approach to treatment.
 - i. List non-pharmacologic treatment modalities for a patient with osteoporosis, **e.g.**, calcium/vitamin D intake, weight-bearing exercise
 - ii. List pharmacologic treatment modalities for a patient with osteoporosis, **e.g.**, bisphosphonates, raloxifene, teriparatide
- e. Describe a rational and evidence-based approach to screening.
 - i. Identify patients at risk for osteopenia and osteoporosis requiring screening and further evaluation, **e.g.**, age, risk factors, fracture risk profile
 - ii. Use appropriate formal clinical risk assessment tools, **e.g.**, Fracture Risk Assessment Tool (FRAX)
- f. Describe possible complications, **e.g.**, kyphosis, loss of height.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the physiology of extrinsic and intrinsic factors impacting bone remodeling.
- b. Describe the prevalence, etiology, and pathophysiology of osteoporosis.

REFERENCES

Osteoporosis. In: Papadakis MA, McPhee SJ, Bernstein J. eds. *Quick Medical Diagnosis & Treatment 2020* New York, NY: McGraw-Hill.

Gaseem A, Forciea MA, McLean RD, Denberg TD, for the Clinical Guidelines Committee of the American College of Physicians. Treatment of low bone density or osteoporosis to prevent fractures in men and women: a clinical practice guideline update from the American College of Physicians. *Ann Intern Med.* 2017; 166:818-39.

US Preventive Services Task Force, Curry SJ, Krist AH, Owens DK, et al. Screening for Osteoporosis to Prevent Fractures: US Preventive Services Task Force Recommendation Statement. *JAMA.* 2018; 319(24):2521-2531.

ACUTE PANCREATITIS

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and possible complications of acute pancreatitis.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, preceding episodes of biliary colic
 - ii. PMH: assess for risk factors, **e.g.**, prior pancreatitis, cholelithiasis, hypertriglyceridemia, causative medications
 - iii. SH: assess for risk factors, **e.g.**, alcohol use
- b. Perform and interpret key physical exam findings.
 - i. Determine presence of findings suggesting an underlying etiology, **e.g.**, liver disease, hypertriglyceridemia
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine severity, **e.g.**, calcium
 - ii. Determine cause, **e.g.**, ALT, triglycerides
 - iii. Determine extent and presence of associated complications, **e.g.**, ultrasound, CT
 - iv. Estimate prognosis, **e.g.**, BISAP, SIRS, CRP
- d. Describe a rational and evidence-based approach to treatment.
 - i. List treatments that control symptoms, **e.g.**, pain control
 - ii. List treatments that reduce risk of complications, **e.g.**, IV fluids, monitoring electrolytes
- e. Describe possible complications, **e.g.**, pseudocyst development, chronic pancreatitis.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the pancreas.
- b. Describe the prevalence, etiology, and pathophysiology of acute pancreatitis.

REFERENCES

Forsmark CE, Vege S, Wilcox C. Acute pancreatitis. *N Engl J Med*. 2016 Nov 17;375(20):1972-81.

Pancreatitis, Acute. In: Papadakis MA, McPhee SJ, Bernstein J. eds. *Quick Medical Diagnosis & Treatment 2019* New York, NY: McGraw-Hill.

PNEUMONIA

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, complications, and prevention of pneumonia.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics of symptoms and relevant ROS, **e.g.**, whether cough is productive, constitutional symptoms
 - ii. PMH: assess for comorbidities that increase risk of complicated infection, **e.g.**, immunocompromised state, exposure history, or vaccination status
 - iii. SH: assess for factors that increase risk of pneumonia, **e.g.**, smoking, vaping, alcohol, opioid use
- b. Perform and interpret key physical exam findings.
 - i. Determine severity of illness, **e.g.**, vital signs, mental status
 - ii. Assess for comorbidities, **e.g.**, dental exam
 - iii. Locate consolidation, **e.g.**, crackles, dullness to percussion
- c. Identify and interpret key laboratory and imaging and list benefits, test characteristics, risks/costs of testing.
 - i. Determine type of organism, **e.g.**, urinary antigens, blood cultures, influenza testing
 - ii. Determine severity of illness, **e.g.**, CBC, procalcitonin
 - iii. Determine location of pneumonia, **e.g.**, CXR
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe initial triaging decisions, **e.g.**, Pneumonia Severity Index or CURB-65
 - ii. List appropriate antimicrobial therapy
 - iii. Describe the need to isolate patient for infection control, **e.g.**, likelihood of *Mycobacteria* or influenza
- e. Describe possible complications.
 - i. Describe infection related complications, **e.g.**, complicated pleural effusion
 - ii. Describe noninfectious complications, **e.g.**, acute coronary conditions, respiratory failure
- f. Describe prevention strategies, **e.g.**, vaccination.

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the pulmonary system.
- b. Describe the prevalence, etiology, and pathophysiology of pneumonia.

REFERENCES

Mandell LA, Winderink R. Pneumonia. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J. eds. *Harrison's Principles of Internal Medicine, 20e* New York, NY: McGraw-Hill.

Pneumonia, Community-Acquired. In: Papadakis MA, McPhee SJ, Bernstein J. eds. *Quick Medical Diagnosis & Treatment 2020* New York, NY: McGraw-Hill.

Stern SC. Cough, Fever and Respiratory Infections. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide 4e* New York, NY: McGraw-Hill.

SUBSTANCE USE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, possible complications, and prognosis of substance intoxication, withdrawal, and substance use disorder (SUD).

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. Use a framework to screen for substance use disorder, e.g., AUDIT or AUDIT-C, CAGE
 - ii. HPI:
 - a. determine characteristics and relevant ROS, e.g., substances used, frequency/amount, method of use
 - b. differentiate substance use from overlapping disorders, e.g., psychiatric disorders
 - iii. PMH: assess for risk factors and predisposing conditions, e.g., trauma exposure, psychiatric disorders
 - iv. Social history: assess for risk factors, e.g., poor/absent social support
 - v. Family history: assess for risk factors, e.g., substance use disorder
- b. Perform and interpret key physical exam findings.
 - i. Evaluate for type or method of a specific substance use, e.g., track marks, frostbite or burns, nystagmus
 - ii. Evaluate for complications, e.g., stigmata of endocarditis, ascites, encephalopathy
 - iii. Evaluate for intoxication, e.g., decreased respiratory rate and pinpoint pupils in opioid intoxication; slurred speech and nystagmus in alcohol intoxication; CNS depression and normal vital signs in benzodiazepine intoxication
 - iv. Evaluate for withdrawal syndromes, e.g., CNS arousal in opioid withdrawal; agitation, hallucinations, and seizures in alcohol withdrawal; agitation, psychosis, and seizures in benzodiazepine withdrawal
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine type or method of substance use, e.g., urine/blood testing anion/osmolal gaps, hyponatremia
 - ii. Determine presence of complications, e.g., blood cultures, HIV testing, hepatitis serologies
 - iii. Differentiate substance use from overlapping disorders, e.g., metabolic encephalopathy, electrolyte abnormalities
- d. Describe a rational and evidence-based approach to treatment of substance intoxication or SUD.
 - i. Describe treatments for acute intoxication, e.g., gastric lavage, specific antidotes (naloxone, flumazenil), dialysis

REFERENCES

- Alcohol and Public Health. Centers for Disease Control and Prevention. <https://www.cdc.gov/alcohol/index.htm>
- American Society of Addiction Medicine. www.asam.org
- Johnson MD. Alcohol Use Disorder (Alcoholism). In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.
- Opioids Portal. Centers for Disease Control and Prevention. <https://www.cdc.gov/opioids/index.html>
- Raj KS, Williams N, DeBattista C. Other Drug & Substance Use Disorders. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.
- Raj KS, Williams N, DeBattista C. Substance Use Disorders. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.
- SAMHSA.gov. Substance Abuse and Mental Health Services Administration. <https://www.samhsa.gov/>

SUBSTANCE USE CONTINUED

- ii. Describe treatments for acute withdrawal syndromes, **e.g.**, benzodiazepines for sedative and alcohol withdrawal, symptom targeted treatment, buprenorphine for opioid withdrawal
- iii. Describe treatments to decrease the risk for relapse in alcohol and opioid use disorder, **e.g.**, naloxone, buprenorphine, acamprosate
- e. Describe possible complications of alcohol use disorder.
 - i. Describe immediate complications, **e.g.**, pancreatitis and Wernicke encephalopathy
 - ii. Describe long-term complications, **e.g.**, Korsakoff syndrome, cirrhosis

2. Relevant medical knowledge from preclinical instruction

- a. Describe the physiology of the addiction including the dysfunctional reward circuit, tolerance, dependence, and withdrawal.
- b. Describe the prevalence of substance use disorder.
- c. Describe the manifestations of the common toxidromes including sympathomimetic, opioid, sedative-hypnotic, cholinergic, and serotonin.
- d. Describe the clinical presentation of common drugs of abuse, including alcohol, cocaine, opiates, benzodiazepines and barbiturates, marijuana, amphetamine, NMDA, PCP, inhalants.

TOBACCO USE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation and treatment of patients who use tobacco.

LEARNING OBJECTIVES

1. Patient Care

- a. Use a framework to assess tobacco use (e.g., Fagerstrom Test for Nicotine Dependence) and address smoking cessation, e.g., the “5As” (Ask, Advise, Assess, Assist, Arrange).
- b. Obtain and interpret key historical features.
 - i. Assess for degree of nicotine dependence, e.g., age of onset of smoking, number of cigarettes per day
 - ii. Assess for triggers to tobacco use, e.g., meals, alcohol
 - iii. Assess for readiness to quit, e.g., willingness to quit smoking in the next 30 days
- c. Obtain and interpret key historical features in patients using vaping products.
 - i. Assess for inhalation of potentially toxic substances, e.g., THC, flavorings
- d. Describe a rational and evidence-based approach to treatment for patients ready to quit smoking.
 - i. Describe how to encourage cessation, e.g., offer brief advice to quit smoking
 - ii. Describe how to assist patients ready to quit, e.g., help develop a quit plan and social support for plan
 - iii. Describe effective medical therapies to treat nicotine withdrawal, e.g., nicotine replacement, varenicline, bupropion
 - iv. Describe how behavioral counseling is an important adjunct to medical therapy, e.g., telephone quit line support, specialty clinic
 - v. Describe when to schedule follow up to monitor response and development problems associated with quitting, e.g., weight gain, depression
 - vi. For tobacco smokers interested in using e-cigarettes for smoking cessation, describe that evidence-based therapies are recommended instead.
- e. Describe a rational and evidence-based approach to treatment for patients NOT ready to quit smoking.
 - i. Describe how to use motivational interviewing techniques to encourage cessation.
 - ii. Describe how to recommend protecting household members from exposure to secondhand smoke.

2. Medical Knowledge

- a. Describe the pharmacology and major side effects of medical therapies used to treat nicotine dependence.

REFERENCES

Jha P, Ramasundararajasingh C, et al. 21st-century hazards of smoking and benefits of cessation in the United States. *N Engl J Med*. 2013; 368(4):341-50.

National Institute on Drug Abuse (NIDA) Clinical Trials Network (CTN)-recommended Common Data Elements (CDEs) of Substance Use Disorders for use in clinical trials and electronic health records (EHRs). Fagerstrom Test for Nicotine Dependence. <https://cde.drugabuse.gov/instrument/d7c0b0f5-b865-e4de-e040-bb89ad43202b>

Siu AL, U.S. Preventive Services Task Force. Behavioral and pharmacotherapy interventions for tobacco smoking cessation in adults, including pregnant women: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2015; 163:622-34.

UPPER RESPIRATORY INFECTIONS

END OF CLERKSHIP GOALS

Students should be able to describe the evaluation, treatment, possible complications, and prevention of upper respiratory infections.

LEARNING OBJECTIVES

1. Patient care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, fever, rhinorrhea, nasal congestion, cough, odynophagia
 - ii. PMH: assess for exacerbating factors or diseases, **e.g.**, seasonal allergies, COPD, immunosuppression
 - iii. SH: assess for risk factors and predisposing conditions, **e.g.**, tobacco use, sick contacts, travel
- b. Perform and interpret key physical exam findings.
 - i. Determine upper respiratory characteristics, **e.g.**, conjunctival, nasal, oral, lymph node and sinus exam
 - ii. Determine lower respiratory findings, **e.g.**, pulmonary exam
 - iii. Determine presence of commonly confused diagnoses, **e.g.**, bacterial sinusitis, *Streptococcal* pharyngitis
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine underlying etiology, **e.g.**, influenza PCR, viral panel
 - ii. Determine underlying severity, **e.g.**, CXR, CBC
 - iii. Determine presence of commonly confused diagnoses, **e.g.**, rapid antigen detection test for *Streptococcus*
- d. Describe a rational and evidence-based approach to treatment.
 - i. List specific factors that dictate when to treat, **e.g.**, presence of associated bacterial infection or acute influenza
- e. Describe possible complications, **e.g.**, acute otitis media, sinusitis, lower respiratory tract infection.
- f. Describe the prevention of upper respiratory infections, **e.g.**, hand washing and annual influenza vaccination.

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the prevalence, etiology, pathophysiology, and transmission of upper respiratory infections.
- b. List the most common viral subtypes along with their prevalence, presentation, and seasonal variation.

REFERENCES

- Harris A, Hicks L. et al. Appropriate Antibiotic Use for Acute Respiratory Tract Infection in Adults: Advice for High-Value Care from the American College of Physicians and the Centers for Disease Control and Prevention. *Ann Intern Med.* 2016; 164(6):425-434.
- Heikkinen T and Järvinen A. The Common Cold. *Lancet.* 2003; 361(9351):51-9.
- Uyeki T, Bernstein H. et al. Clinical Practice Guidelines by the Infectious Diseases Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenza. Oxford University Press for the Infectious Diseases Society of America 2018.
- Yoon Y., Park C. et al. Guidelines for the Antibiotic Use in Adults with Acute Upper Respiratory Tract Infections. *Infect Chemother.* 2017; 49(4): 326-352.

URINARY TRACT INFECTION

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, possible complications, and prevention of urinary tract infection (UTI).

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, dysuria, hematuria, fever/chills
 - ii. PMH: assess for risk factors, **e.g.**, pregnancy, urinary tract abnormalities, neurogenic bladder, urinary catheter/urologic instrumentation
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology or complication, **e.g.**, costovertebral angle tenderness, vaginal or penile discharge, prostatic hypertrophy
- c. Identify and interpret key laboratory and imaging testing including indications, benefits, test characteristics, risks/costs of testing.
 - i. Use tests to establish a diagnosis in selected patients, **e.g.**, urinalysis, urine culture
 - ii. Assess for complications in selected patients, **e.g.**, CBC, blood cultures, imaging
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe when antimicrobial therapy is needed and incorporate factors influencing antimicrobial choice, **e.g.**, risk factors for multidrug-resistant organisms, prior therapy
 - ii. Describe whether UTI complications exist, **e.g.**, sepsis, obstruction, relapsing infection, and describe appropriate treatment, **e.g.**, with IV antibiotics or further imaging
 - iii. Describe behavioral changes and pharmacological treatments to reduce recurrent cystitis based on risk factors, **e.g.**, fluid intake, postcoital voiding, contraception modification
- e. Describe possible complications, **e.g.**, sepsis, abscess.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the genitourinary system.
- b. Describe the prevalence, etiology, and pathophysiology of UTI.

REFERENCES

- American Urological Association Medical Student Curriculum: Adult UTI. <https://www.auanet.org/education/auauniversity/for-medical-students/medical-student-curriculum/adult-uti>
- Gupta K, Grigoryan L, Trautner B. Urinary Tract Infection. *Ann Intern Med* 2017; 167(7): ITC49-ITC64.
- Gupta K, Hooton TM, Naber KG, et al. International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. *Clin Infect Dis* 2011; 52(5): e103-e120.
- Hooton TM, Bradley SF, Cardenas DD, et al. Diagnosis, Prevention, and Treatment of Catheter-Related Urinary Tract Infection in Adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clin Infect Dis* 2010; 50(5): 652-663.
- Nicolle LE, Gupta K, Bradley SF, et al. Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America. *Clin Infect Dis* 2019; 68(10): e83-e110.
- Pallin DJ, Ronan C, Montazeri K, et al. Urinalysis in Acute Care of Adults: Pitfalls in Testing and Interpreting Results. *Open Forum Infect Dis* 2014; 1(1): ofu019.

VENOUS THROMBOEMBOLIC DISEASE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, treatment, and possible complications of venous thromboembolic disease (VTE), including deep venous thrombosis and pulmonary embolism.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, e.g., leg pain/swelling, chest pain, shortness of breath
 - ii. PMH: determine risk factors and predisposing conditions, e.g., prior VTE, bleeding or clotting disorders, causative medications
 - iii. FH: assess for family history of bleeding or clotting disorders
- b. Perform and interpret key physical exam findings.
 - i. Determine severity, e.g., tachycardia, hypotension
 - ii. Assess for findings suggesting an underlying etiology, e.g., leg pain or swelling, findings of venous insufficiency
 - iii. Determine presence of right heart failure, e.g., elevated jugular venous pressure
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Assess extent of thrombosis, e.g., compression ultrasonography, CT angiogram
 - ii. Assess severity of illness, e.g., ABG, echocardiogram
- d. Describe a rational and evidence-based approach to treatment.
 - i. Use a validated clinical risk score to establish pre-test probability for DVT or PE, e.g., Wells score, Revised Geneva Score
 - ii. Describe treatment for thrombosis, e.g., direct-acting oral anticoagulant medications, low molecular weight heparin, thrombolysis
 - iii. Describe treatment for hemodynamic instability, e.g., oxygenation, fluid resuscitation
- e. Describe possible complications.
 - i. Describe acute complications, e.g., hemodynamic instability
 - ii. Describe chronic complications, e.g., post-thrombotic syndrome, venous ulcerations, pulmonary hypertension

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy of the pulmonary and lower extremity venous circulation.
- b. Describe the prevalence, etiology, and pathophysiology of VTE.
- c. Describe the general mechanism of action for heparins, Vitamin K antagonists, and DOAC medications.

REFERENCES

- Di Nisio M, van Es N, Büller HR. Deep vein thrombosis and pulmonary embolism. *Lancet* 2016; 388: 3060–73.
- Kearon C, Akl EA, Ornelas J, et al. Antithrombotic therapy for VTE disease: CHEST guideline and expert panel report. *Chest* 2016; 149(2):315–52.
- Raja AS, Greenberg JO, Gaseem A, et al. Evaluation of patients with suspected acute pulmonary embolism: Best practice advice from the Clinical Guidelines Committee of the American College of Physicians. *Ann Intern Med*. 2015; 163:701-11.
- Stubbs MJ, Mouyis M, Thomas M. Deep vein thrombosis. *BMJ* 2018; 360: k351.

The background is a complex, abstract composition of overlapping, curved, organic shapes in various shades of teal, green, and brown. The shapes create a sense of depth and movement, resembling stylized leaves or flowing water. The colors transition from a deep teal at the top to a lighter green at the bottom, with some darker brownish-green accents.

CLINICAL CONDITIONS

ABDOMINAL PAIN

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of abdominal pain.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, acuity, location, vomiting, fever
 - ii. PMH: determine risk factors, **e.g.**, prior surgery, hernias, malignancy, causative medications
 - iii. SH: determine risk factors, **e.g.**, tobacco, opioid use
- b. Perform and interpret key physical exam findings.
 - i. Differentiate causes, **e.g.**, localized tenderness, peritoneal signs, presence of distension
 - ii. Evaluate for extra intestinal manifestations, **e.g.**, skin exam, joint exam, cardiac exam
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Rule out not-to-miss diagnoses, **e.g.**, complete blood count, plain films, abdominal CT
 - ii. Perform further testing in selected patients, **e.g.**, liver function tests, ultrasound, MRI, angiography
 - iii. Follow recommended guidelines for abdominal CT imaging, **e.g.**, American College of Radiology Appropriateness Criteria
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider the not-to-miss diagnoses, **e.g.**, the “Serious Six”: mesenteric ischemia, infection with peritonitis, viscus rupture with peritonitis, leaking AAA, aortic dissection, inferior myocardial infarction
 - ii. Use an anatomic approach, **e.g.**, localization of pain by quadrants
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify indications for parental antibiotics and hospitalization
 - ii. List indications for immediate surgical consultation, **e.g.**, leaking AAA, peritonitis

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the hepatic, biliary, gastrointestinal, vascular, and musculoskeletal systems.

REFERENCES

Clair DG, Beach JM. Mesenteric Ischemia. *N Engl J Med* 2016; 374:959-968.

Natesan S, Lee J, Volkamer H, Thoureen T. Evidence-Based Medicine Approach to Abdominal Pain. *Emerg Med Clin North Am.* 2016; 34(2): 165-90.

Stack SW. Abdominal Pain. In: Stern SC, Cifu AS, Altkorn D, eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e* New York, NY: McGraw-Hill.

ACID BASE DISORDERS

END OF CLERKSHIP GOALS

Students should be able to explain the etiology, evaluation, differential diagnosis, and treatment of acid base disorders.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: differentiate respiratory from metabolic disorders and relevant ROS, e.g., hyperventilation, CNS depression, vomiting, diarrhea
 - ii. PMH: determine risk factors and predisposing conditions, e.g., pulmonary disease, neuromuscular disease
 - iii. SH: assess for associated risk factors, e.g., alcohol use
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology, e.g., BP and respiratory rate, stigmata of cirrhosis
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine primary, compensatory, and mixed respiratory and metabolic acid base disorders, e.g., blood gas, chemistry panel
- d. Develop and prioritize a differential diagnosis including common and not- to-miss diagnoses.
 - i. Differentiate each of the major categories of acid base disorders, e.g., respiratory alkalosis, respiratory acidosis, metabolic alkalosis, metabolic acidosis
 - ii. Use the presence or absence of an anion gap to determine the etiology of acidosis
- e. Describe a rational and evidence-based approach to treatment.
 - i. List urgent treatments if needed, e.g., hemodynamic stabilization, IV fluid administration, poison control notification
 - ii. Describe treatments based on etiology, e.g., correction of electrolyte abnormalities

2. Relevant medical knowledge from preclinical instruction

- a. Describe the physiology of pulmonary and renal contributions to normal acid base balance.
- b. Describe the pathophysiology of each of the four cardinal acid base disorders and the expected compensatory mechanisms.

REFERENCES

- Koeppen, B. and Stanton, B. (2018) *Renal Physiology Sixth Edition*. Philadelphia, Pennsylvania: Elsevier.
- Rose, B. and Post, T. (2001) *Clinical Physiology of Acid-Base and Electrolyte Disorders Fifth Edition*. New York, New York: McGraw-Hill.
- Stern SC. Acid-Base Abnormalities. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e* New York, NY: McGraw-Hill.

ACUTE KIDNEY INJURY

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, treatment, prognosis, and prevention of acute kidney injury (AKI).

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine symptoms that may indicate a specific etiology, **e.g.**, fevers, arthralgias
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, causative medications, toxin exposures
- b. Perform and interpret key physical exam findings.
 - i. Assess volume status, **e.g.**, orthostatic blood pressure measurement, jugular venous pressure, presence of edema
 - ii. Assess presence of uremic symptoms, **e.g.**, pericardial rub, asterixis
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Identify presence of AKI, **e.g.**, patients with rising serum creatinine or decrease urine output
 - ii. Determine underlying etiology, **e.g.**, urinalysis with microscopic evaluation, urine chemistries, chemistry panel, renal ultrasound
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Distinguish pre-renal, renal, and post-renal causes
 1. Describe pre-renal causes, **e.g.**, ineffective circulating volume
 2. Describe intra-renal causes, **e.g.**, glomerular, tubular, interstitial and vascular
 3. Describe post-renal causes, **e.g.**, ureteral obstruction or bladder outlet obstruction
- e. Describe a rational and evidence-based approach to treatment.
 - i. Describe treatment of acute conditions, **e.g.**, hyperkalemia, fluid deficit
 - ii. Describe treatment based on etiology, **e.g.**, relieving obstruction in bladder outlet obstruction, withdrawal of causative medications in acute interstitial nephritis
- f. Describe the long-term renal prognosis for patients with AKI.
- g. List clinical interventions that may prevent AKI in patients at increased risk, **e.g.**, discontinuation of causative medications, prevention of hypotension, judicious use of iodinated contrast.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the kidney glomerular and tubular function.
- b. Describe the prevalence and pathophysiology of acute kidney injury.

REFERENCES

- Barbar SD, Clere-Jehl R, Bourredjem A et al. Timing of renal replacement therapy in patients with acute kidney injury and sepsis. *N Engl J Med* 2018; 379(15): 1431-1442.
- Esquivel EL. Kidney Injury, Acute. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e* New York, NY: McGraw-Hill.
- Levey AS and James MT. Acute Kidney Injury. *Ann Intern Med* 2017; 167(9): ITC66-ITC80.
- Moore PK, Hsu RK, and Liu KD. Management of Acute Kidney Injury: Core Curriculum 2018. *Am J Kidney Dis* 2018; 72(1): 136 - 148.
- Perazella MA, Coca SG. Traditional urinary biomarkers in the assessment of hospital-acquired AKI. *Clin J Am Soc Nephrol*. 2012; 7: 167-74.

ALTERED MENTAL STATUS

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, treatment, and possible complications of altered mental status.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, neurologic symptoms
 - ii. PMH: assess for risk factors, **e.g.**, previous history of altered mental status or seizures, causative medications
 - iii. SH: assess for risk factors, **e.g.**, alcohol or recreational drug use
- b. Perform and interpret key physical exam findings.
 - i. Determine characteristics, **e.g.**, a mental status exam
 - ii. Assess for an underlying etiology, **e.g.**, focal neurologic findings
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Assess metabolic functioning and presence of infection, **e.g.**, BMP, CBC
 - ii. Determine need for further testing if diagnosis remains unclear, **e.g.**, Vitamin B12, RPR, urine toxicology screen
 - iii. Determine need for further testing to target signs and symptoms, **e.g.**, EKG, CXR, LP, EEG
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider neurologic diagnoses, **e.g.**, CVA
 - ii. Consider psychiatric diagnoses, **e.g.**, mania, schizophrenia
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify treatments for underlying illness, **e.g.**, infection, drug toxicity, fluid/electrolyte disturbances
 - ii. List delirium precautions, **e.g.**, reduce overstimulation, minimize restraint use, improve sleep-wake cycle
- f. Describe possible complications, **e.g.**, falls, aspiration, decubitus ulcers.

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the brain.
- b. Describe the pharmacologic mechanisms of neuroactive medications.

REFERENCES

Girard T et al. Haloperidol and Ziprasidone for Treatment of Delirium in Critical Illness. *NEJM* 2018; 279: 26: 2506-2516.

Neufeld KJ, Max LK, Koyi MB, Needham DM. Delirium. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB. eds. *Principles and Practices of Hospital Medicine, 2e* New York, NY: McGraw-Hill.

Sanghani PK. Delirium and Dementia. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide 4e* New York, NY: McGraw-Hill.

ANEMIA

END OF CLERKSHIP GOALS

Students should be able to explain the etiology, evaluation, differential diagnosis, and treatment of anemia.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, acute blood loss, fatigue, dyspnea, chest pain
 - ii. PMH: assess for ongoing risk factors, **e.g.**, chronic renal or liver disease, malignancies, autoimmune disorders
 - iii. SH: assess for risk factors, **e.g.**, travel history, alcohol use
 - iv. FH: assess for heritable conditions, **e.g.**, sickle cell disease
- b. Perform and interpret key physical exam findings.
 - i. Assess for underlying disease, **e.g.**, lymphadenopathy, splenomegaly
 - ii. Evaluate for associated cytopenias or coagulopathies, **e.g.**, petechiae, gum bleeding, ecchymoses
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Identify anemia chronicity, **e.g.**, review of previous labs
 - ii. Determine underlying etiology, **e.g.**, CBC with differential, smear, reticulocyte production index
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Use a pathophysiologic framework of acute blood loss, **e.g.**, underproduction of RBCs, increased destruction of RBCs, sequestration of RBCs
- e. Describe a rational and evidence-based approach to treatment.
 - i. Describe urgent treatment if needed, **e.g.**, blood transfusion, embolization
 - ii. Describe treatment based on underlying etiology, **e.g.**, replacement for deficiencies

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the hematopoietic system.
- b. Describe the prevalence, etiology, and pathophysiology of common causes of anemia.

REFERENCES

McGee S. Anemia. In: McGee S ed. *Evidence-Based Physical Diagnosis*. Fourth Edition. Elsevier, Inc.

Smith J. Anemia. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e*. New York, NY: McGraw-Hill.

BACK PAIN

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of back pain.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, e.g., acuity, injury, fever, neurologic dysfunction
 - ii. PMH: determine risk factors, e.g., malignancy, immune compromise, osteoporosis
 - iii. SH: determine risk factors, e.g., intravenous drug use
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggestive of not-to-miss diagnoses, e.g., saddle anesthesia, weakness
 - ii. Differentiate causes, e.g., screening neurologic exam, straight leg raise
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Perform tests in selected patients, e.g., complete blood count, inflammatory markers, MRI
 - ii. Follow recommended guidelines for spinal imaging, e.g., American College of Radiology Appropriateness Criteria
- d. Develop and prioritize a differential diagnosis including more common, less common, and not-to-miss diagnoses.
 - i. Consider common diagnoses, e.g., nonspecific low back pain, lumbar strain
 - ii. Consider less common diagnoses, e.g., ankylosing spondylitis, vertebral compression fracture, intervertebral disc herniation
 - iii. Consider the not-to-miss diagnoses, e.g., infections, abdominal aortic aneurysm, malignancy
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify treatment for non-specific low back pain, e.g., progressive mobilization, physical therapy, nonsteroidal anti-inflammatory agents
 - ii. Identify indications for immediate surgical consultation, e.g., cauda equina syndrome, presence of epidural abscess, progressive neurologic deficit

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the musculoskeletal and neurologic system.

REFERENCES

Altkorn D. Back Pain. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e*. New York, NY: McGraw-Hill.

Qaseem A, Wilt TJ, McLean RM, Forciea MA; Clinical Guidelines Committee of the American College of Physicians. Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline from the American College of Physicians. *Ann Intern Med.* 2017;166(7):514-530.

CANCER SCREENING

END OF CLERKSHIP GOALS

Students should be able to explain the value and limitations of screening programs, in addition to screening recommendations for breast, cervical, colon, lung and prostate cancer.

LEARNING OBJECTIVES

1. Patient care

- a. Obtain and interpret key historical features.
 - i. PMH: determine risk factors, **e.g.**, HPV immunization
 - ii. FH: determine risk factors, **e.g.**, family history of colon, breast, or prostate cancer
 - iii. SH: determine risk factors, **e.g.**, history of smoking
- b. Describe a rational and evidence-based approach to screening.
 - i. Compare the guidelines from different organizations, **e.g.**, United States Preventative Services Task Force, American College of Physicians
 - ii. Explain basic principles of screening to patients, **e.g.**, risks and benefits, recommended frequency, and duration
 - iii. Use risk factors for breast, cervical, colon, lung, and prostate cancer to determine screening recommendations
- c. Identify and interpret key laboratory and imaging tests and list indications, benefits, test characteristics, risks/costs of screening for breast, cervical, colon, lung, and prostate cancer.

2. Relevant medical knowledge from preclinical instruction

- a. Describe characteristics of a good screening test.
- b. Describe potential harms of screening.
- c. Define, calculate, and interpret the sensitivity, specificity, positive predictive value and negative predictive value.
- d. Explain how prevalence affects the predictive value of screening tests.

REFERENCES

Hoffman RM, Sanchez R. Lung Cancer Screening. *Med Clin North Am.* 2017; 101(4):769-785.

Jordan V, Khan M, Prill D. Breast cancer screening. Why can't everyone agree? *Prim Care.* 2019; 46(1): 97-115.

Pinsky PF. Principles of cancer screening. *Surg Clin North Am.* 2015; 95(5): 953-66.

Shieh Y, Eklund M, et al. Population based screening for cancer: hope and hype. *Nat Rev Clin Oncol.* 2016; 13(9):550-65.

US Preventive Services Task Force, Bibbins-Domingo K, Grossman DR, et al. Screening for colorectal cancer: US Preventive Services Task Force recommendation statement. *JAMA* 2016; 315(23): 2564-75.

US Preventive Services Task Force, Grossman DC, Curry SJ, et al. Screening for prostate cancer: US Preventive Services Task Force recommendation statement. *JAMA* 2018; 319(18):1901-13.

U.S. Preventive Services Task Force. Recommendations for Primary Care Practice. www.uspreventiveservicestaskforce.org

Wilt TJ, Harris RP, Qaseem A; High Value Care Task Force of the American College of Physicians. Screening for cancer: Advice for high-value care from the American College of Physicians. *Ann Intern Med.* 2015; 162(10):718-25.

CHEST PAIN

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of chest pain.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics of chest pain and relevant ROS, **e.g.**, dyspnea, GERD, constitutional symptoms
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, prior history of CAD, diabetes, venous thrombotic events
 - iii. SH: assess for risk factors, **e.g.**, tobacco, cannabis, alcohol use
- b. Perform and interpret key physical exam findings.
 - i. Differentiate causes of chest pain, **e.g.**, posterior pharynx and chest wall exam, peripheral pulses
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Determine presence of not-to-miss diagnoses in appropriate cases, **e.g.**, ECG, troponin
 - ii. Evaluate presence of other diagnoses in appropriate cases, **e.g.**, CXR, d- dimer
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Use decision tools to determine likelihood of a diagnosis, **e.g.**, Modified Wells score, HEART score
 - ii. Use an anatomic approach to the diagnosis, **e.g.**, skin to organ
 - iii. Consider not-to-miss diagnoses, **e.g.**, Who's my **PAPPA**: **P**ericarditis, **A**cute coronary syndrome, **P**neumothorax, **P**ulmonary Embolism, **A**ortic aneurysm
- e. Describe a rational and evidence-based approach to treatment.
 - i. List treatments based on etiology, **e.g.**, aspirin and statin for ACS

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the cardiac, pulmonary, gastrointestinal tract, neurologic, and musculoskeletal systems.

REFERENCES

Bahia A and Albert RK. The modified wells score accurately excludes pulmonary embolus in hospitalized patients receiving heparin prophylaxis. *J Hosp Med.* 2011; 6: 190-194.

Byrne C, Toarta C, Backus B, and Holt T. (2018), The HEART score in predicting major adverse cardiac events in patients presenting to the emergency department with possible acute coronary syndrome: protocol for a systematic review and meta-analysis. *Systemic Reviews* 2018; 7: 148-58.

Morrow DA. Chest Discomfort. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo

J. eds. *Harrison's Principles of Internal Medicine*, 20e New York, NY: McGraw-Hill.

CONSTIPATION

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of constipation.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, Rome IV criteria, dietary history, alarm symptoms
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, prior abdominal surgery, diseases associated with secondary constipation, causative medications
 - iii. SH: assess for risk factors, **e.g.**, physical, or sexual abuse
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology, **e.g.**, rectal exam
 - ii. Determine presence of complications, **e.g.**, abdominal exam
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine cause, **e.g.**, basic metabolic panel, thyroid studies
 - ii. Evaluate for alarm symptoms, **e.g.**, colonoscopy, abdominal computed tomography
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, irritable bowel syndrome, medication-associated constipation
 - ii. Consider not-to-miss diagnoses, **e.g.**, bowel obstruction
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify clinical features that indicate need for additional testing, **e.g.**, constitutional symptoms
 - ii. Describe non-pharmacological therapies, **e.g.**, dietary modification, biofeedback
 - iii. Describe pharmacological therapies, **e.g.**, bulking agents, osmotic and stimulant laxatives, prokinetics

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the alimentary tract.
- b. Describe the epidemiology, etiologies, and pathophysiology of constipation.
- c. Describe the pharmacology of the medications used to treat constipation.

REFERENCES

- Bharucha AE, Pemberton JH, Locke GR 3rd. American Gastroenterological Association technical review on constipation. *Gastroenterology*. 2013; 144(1):218-238.
- Forootan M, Bagheri N, Darvishi M. Chronic constipation: A review of literature. *Medicine (Baltimore)*. 2018; 97(20): e10631.
- McQuaid KR. Constipation. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.
- Sizar O, Gupta M. Opioid Induced Constipation. [Updated 2019 Apr 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019 Jan.
- Sobrado CW, Neto IJFC, Pinto RA, Nahas SC, Ceconello I. Diagnosis and treatment of constipation: a clinical update based on the Rome IV criteria. *Journal of Coloproctology*. 2018;38(2):137-144.

COUGH

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of cough.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, upper respiratory symptoms, lower respiratory symptoms, GERD symptoms, constitutional symptoms
 - ii. PMH: determine risk factors and predisposing conditions, **e.g.**, causative medications, asthma, COPD, GERD, allergies
 - iii. SH: assess for exposures, **e.g.**, tobacco, occupation, or environment
- b. Perform and interpret key physical exam findings.
 - i. Determine level of respiratory distress, **e.g.**, respiratory rate
 - ii. Assess for signs of pulmonary consolidation and obstruction, **e.g.**, wheezes, rhonchi, and rales
 - iii. Determine presence of upper respiratory findings, **e.g.**, post-nasal drip and bacterial sinusitis
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine need for chest x-ray in certain cases, **e.g.**, prolonged cough
 - ii. Determine need for lung function tests when considering certain diagnoses, **e.g.**, asthma
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Use timing of cough to develop differential diagnosis, **e.g.**, acute, subacute, chronic
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify the necessity for urgent treatments, **e.g.**, bronchodilators, antibiotics, diuretics
 - ii. Identify empiric treatments, **e.g.**, upper airway cough syndrome treatment, proton pump inhibitors
- f. Describe cessation counseling for users of tobacco and other nicotine delivery systems.

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the upper and lower respiratory system.

REFERENCES

Benich JJ, Carek PJ. Evaluation of the patient with chronic cough. *American Family Physician*. 2011; 84(8):887-92.

Irwin RS, Baumann MH, et al. Diagnosis and Management of Cough Executive Summary: ACCP Evidence-Based Clinical Practice Guidelines. *Chest*. 2006; 182: 72S-74S.

Cough. In: Papadakis MA, McPhee SJ, Bernstein J. eds. *Quick Medical Diagnosis & Treatment 2020* New York, NY: McGraw-Hill.

DIARRHEA

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of diarrhea.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics of diarrhea and relevant ROS, **e.g.**, acuity, prior episodes, presence of blood
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, immune compromised state, bowel surgery, causative medications
 - ii. FH: assess for inherited conditions, **e.g.**, inflammatory bowel disease, colon cancer
 - iv. SH: assess for potential causes, **e.g.**, dietary lactose or gluten
- b. Perform and interpret key physical exam findings.
 - i. Evaluate for an underlying etiology, **e.g.**, abdominal tenderness, rectal exam
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine severity in select cases, **e.g.**, CBC, creatinine, electrolytes
 - ii. Determine cause in select cases, **e.g.**, C diff toxin NAAT, occult blood, fecal calprotectin
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider causes of acute diarrhea, **e.g.**, viral infection, bacterial infection
 - ii. Consider causes of chronic diarrhea, **e.g.**, irritable bowel syndrome, inflammatory bowel disease
- e. Describe a rational and evidence-based approach to treatment.
 - i. Describe methods to treat/prevent complications, **e.g.**, aggressive intravenous fluids, replacement of serum electrolytes
 - ii. Describe treatment of specific etiologies, **e.g.**, C diff colitis, infectious colitis, irritable bowel syndrome

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy and physiology of the small and large intestine.
- b. Describe the prevalence, etiology, and pathophysiology of acute and chronic diarrhea.

REFERENCES

Diarrhea, Acute. In: Papadakis MA, McPhee SJ, Bernstein J. eds. Quick Medical Diagnosis & Treatment 2020 New York, NY: McGraw-Hill.

Diarrhea, Chronic. In: Papadakis MA, McPhee SJ, Bernstein J. eds. Quick Medical Diagnosis & Treatment 2020 New York, NY: McGraw-Hill.

DYSPNEA

END OF CLERKSHIP GOAL

Students should be able to explain the evaluation, differential diagnosis, and treatment of dyspnea.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics of symptoms and relevant ROS, e.g., acuity, cough, chest pain
 - ii. PMH: determine risk factors and predisposing conditions, e.g., coronary artery disease, immunosuppression
 - iii. SH: assess for risk factors, e.g., tobacco use, occupational exposures
- b. Perform and interpret key physical exam findings.
 - i. Determine severity of illness, e.g., vital signs, work of breathing
 - ii. Determine etiology, e.g., abnormal lung sounds, S3 gallop, JVD
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Assess for not-to-miss diagnoses, e.g., CXR, ECG, d-dimer
 - ii. Determine etiology in selected patients, e.g., chest computerized tomography, pulmonary function tests, echocardiography
- d. Develop and prioritize a differential diagnosis for dyspnea that includes common and not-to-miss diagnoses.
 - i. Consider the most common causes of dyspnea, e.g., obstructive lung disease pneumonia, heart failure, venous thromboembolic disease
 - ii. Consider not-to-miss diagnoses, if appropriate, e.g., (ACTASAP):
Arrhythmia, **C**oronary syndrome, **T**amponade, **A**irway obstruction, **S**tenosis (aortic, mitral), **A**naphylaxis, **P**neumothorax
- e. Describe a rational and evidence-based approach to treatment.
 - i. List treatments based on etiology, e.g., diuretics for heart failure, bronchodilators for obstructive lung disease

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the pulmonary, cardiac, neurologic, and musculoskeletal systems.
- b. Describe the physiology of acid-base homeostasis.

REFERENCES

Nadler PL, Gonzales R. Dyspnea. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Trowbridge RL. Dyspnea. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e* New York, NY: McGraw-Hill.

EDEMA

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of edema.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics of edema and relevant ROS, **e.g.**, acuity, shortness of breath, abdominal swelling
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, heart disease, liver disease, kidney disease, causative medications
 - iii. SH: assess for dietary contributors, **e.g.**, high salt intake
- b. Perform and interpret key physical exam findings.
 - i. Determine characteristics, **e.g.**, unilateral, or bilateral, presence of pitting vs nonpitting
 - ii. Assess for findings suggesting an underlying etiology, **e.g.**, erythema, skin changes, heart disease
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine underlying etiology, **e.g.**, serum creatinine, serum albumin, echocardiography
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, chronic venous disease, medication related
 - ii. Consider not-to-miss diagnoses, **e.g.**, heart failure, renal disease, cirrhosis
- e. Describe a rational and evidence-based approach to treatment.
 - i. Describe treatment based on etiology, **e.g.**, diuretics for heart failure

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the cardiac, hepatic, renal, lymphatic, and vascular systems.

REFERENCES

Alexander J. Edema. In: Stern SC, Cifu AS, Altkorn D. eds. Symptom to Diagnosis: An Evidence- Based Guide, 4e New York, NY: McGraw-Hill.

FATIGUE

END OF CLERKSHIP GOAL

Students should be able to explain the evaluation, differential diagnosis, and treatment of fatigue.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, acuity, constitutional symptoms, psychiatric symptoms
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, causative medications, chronic medical problems, psychiatric disorders
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology, **e.g.**, conjunctival pallor, thyroid enlargement or nodules, lymphadenopathy
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Assess for cause, recommended in most patients, **e.g.**, CBC with differential, basic metabolic panel, TSH
 - ii. Assess for cause, recommended in selected patients, **e.g.**, HIV test, sleep study, CRP
- d. Develop and prioritize a differential diagnosis for fatigue that includes common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, psychiatric disorders, sleep disorders, medication side effects
 - ii. Consider not-to-miss diagnoses, **e.g.**, anemia, malignancy, undiagnosed chronic illness
 - iii. Determine the likelihood of depression and anxiety using structured questionnaires, **e.g.**, PHQ-2/PHQ-9, GAD-2/GAD-9 scales
 - iv. Determine the likelihood of sleep apnea using a structured tool, **e.g.**, Epworth Sleepiness Scale, STOP-BANG score (Snoring, Tiredness, Observed apnea, blood Pressure, Body mass index, Age, Neck circumference, Gender)
- e. Describe a rational and evidence-based approach to evaluate a patient with fatigue.
 - i. Describe treatment based on etiology, **e.g.**, medications for depression, CPAP for sleep apnea

2. Relevant medical knowledge from preclinical instruction

- a. Describe the pharmacology of medications that can cause fatigue.
- b. Describe the prevalence of fatigue in common diagnoses, **e.g.**, depression, anxiety, obstructive sleep apnea and insomnia.

REFERENCES

Hamilton W, Watson, J, Round A. Investigating fatigue in primary care. *BMJ* 2010; 341: c4259.

Weinstein AR. Fatigue. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence- Based Guide, 4e* New York, NY: McGraw-Hill.

Wilson J, Morgan M, Magin P, Van Driel M. Fatigue – a rational approach to investigation. *Australian Family Physician*. 2014; 43(7):457-461.

FEVER

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of fever.

LEARNING OBJECTIVES

1. Patient care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, duration, associated constitutional symptoms
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, recent invasive procedures, immunocompromised state, causative medications
 - iii. SH: assess for risk factors and predisposing conditions, **e.g.**, travel, intravenous drug use
- b. Perform and interpret key physical exam findings.
 - i. Determine findings suggesting an underlying etiology, **e.g.**, abdominal tenderness, murmurs, oropharyngeal erythema
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Use tests to determine cause, recommended in most patients, **e.g.**, CBC, urinalysis, blood cultures
 - ii. Use tests to determine cause, recommended in selected patients, **e.g.**, HIV test, ANA, CT scans, echocardiogram
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common causes, **e.g.**, influenza, pneumonia, pharyngitis
 - ii. Consider fever-related emergencies, **e.g.**, neutropenic fever, sepsis/septic shock
- e. Describe a rational and evidence-based approach to treatment.
 - i. Utilize risk scores when appropriate, **e.g.**, SOFA/qSOFA
 - ii. Identify treatments based on etiology, **e.g.**, broad-spectrum antibiotics for sepsis/septic shock or neutropenic fever

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the physiology and pathophysiology of fever.
- b. Describe the physiology and pathophysiology of common etiologies of fever, including infection, malignancy, and connective tissue disorders.
- c. Describe the physiology and pathophysiology of thermoregulatory disorders including hyperthermia and hyperpyrexia.

REFERENCES

Cunha BA, Lortholary O, Cunha CB. Fever of unknown origin: A clinical approach. *Am J Med.* 2015; 128: 1138.e1-1138.e15.

Freifeld AG, Bow EJ, Sepkowitz KA, et al. Clinical Practice Guideline for the use of antimicrobial agents in neutropenic patients with cancer: 2010 Update by the Infectious Diseases Society of America. *Clin Infect Dis.* 2011; (52): e56-e93.

Nadler PL, Gonzales R. Fever & Hyperthermia. In: Papadakis MA, McPhee SJ, Rabow MW, eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Ogoina D. Fever, fever patterns and diseases called 'fever' - A review. *J Infect Pub Health.* 2011; 4:108-124.

O'Grady N, Barie P, Bartlett J, et al. Guidelines for evaluation of new fever in critically ill adult patients: 2008 update from the American College of Critical Care Medicine and the Infectious Diseases Society of America. *Crit Care Med.* 2008; 36:1330-1349.

Rhodes A, Evans L, Alhazzani W, et al. Surviving Sepsis Campaign: International guidelines for management of sepsis and septic shock: 2016. *Crit Care Med.* 2017; 45: 486-552.

GASTROINTESTINAL BLEED

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of gastrointestinal bleed.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain, identify, and interpret key historical features.
 - i. HPI: differentiate between suspected upper and lower sources of bleeding; determine relevant ROS, **e.g.**, hematemesis, coffee-ground emesis, melena, hematochezia, previous vomiting, or retching
 - ii. PMH: assess for risk factors, **e.g.**, peptic, or duodenal ulcer disease, cirrhosis, coagulopathy, causative medications
- b. Perform and interpret key physical exam findings.
 - i. Differentiate between overt, occult, and obscure gastrointestinal bleeding, **e.g.**, examine stool, analyze nasogastric aspirate
 - ii. Determine hemodynamic stability, **e.g.**, orthostatic vitals to assess intravascular volume
 - iii. Assess for additional signs and symptoms associated with gastrointestinal bleeding, **e.g.**, pallor, abdominal pain, signs of chronic liver disease including jaundice, ascites, telangiectasias
- c. Identify and interpret key laboratory testing and imaging and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Evaluate degree of blood loss and bleeding susceptibility, **e.g.**, complete blood count (CBC), INR, PTT, comprehensive metabolic panel (CMP)
 - ii. Describe how to prepare for potential transfusion, **e.g.**, type and cross-matching,
 - iii. Evaluate underlying etiology, **e.g.**, Helicobacter pylori testing
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider not-to-miss diagnoses, **e.g.**, esophageal variceal hemorrhage
 - ii. Use a categorical approach to diagnosis, **e.g.**, vascular, inflammatory, neoplastic, traumatic, and iatrogenic causes
 - iii. Use an anatomic approach to further refine the diagnosis, **e.g.**, upper: peptic ulcer disease, variceal hemorrhage, Mallory-Weiss tear, lower: diverticular disease, angiodysplasia or angiectasia, neoplasms
- e. Describe a rational and evidence-based approach to treatment.
 - i. Describe when urgent treatment modalities are needed, **e.g.**, immediate intravenous (IV) access, IV fluids, proton pump inhibitors, octreotide, antibiotics, transfusions, gastroenterology consultation
 - ii. List indications for imaging and/or potential procedural interventions, **e.g.**, Esophagogastroduodenoscopy (EGD), colonoscopy, CT angiography
 - iii. Describe appropriate transfusion threshold for patients with blood loss

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of upper and lower gastrointestinal bleed.

REFERENCES

Gralnek IM, Dumonceau JM, Kuipers EJ, et al. Diagnosis and management of nonvariceal upper gastrointestinal hemorrhage: European Society of Gastrointestinal Endoscopy (ESGE) guideline. *Endoscopy* 2015; 47: a1-a46.

Laine L, Jensen DM. Management of patients with ulcer bleeding. *Am J Gastroenterol.* 2012; 107:345-360.

Manning-Dimmitt LL, Dimmitt SG, Wilson GR. Diagnosis of Gastrointestinal Bleeding in Adults. *Am Fam Physician* 2005; 71(7):1339-46.

McQuaid KR. Gastrointestinal Bleeding. In: Papadakis MA, McPhee SJ, Rabow MW. Eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Villanueva C, Colomo A, Bosch A. Transfusion for acute upper gastrointestinal bleeding. *N Engl J Med* 2013; 368:1362-1363.

HEADACHE

END OF CLERKSHIP GOAL

Students should be able to explain the evaluation, differential diagnosis, and treatment of headache.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, acuity, neurologic symptoms, constitutional symptoms
 - ii. PMHx: assess for risk factors and predisposing conditions, **e.g.**, causative medications, history of malignancy
- b. Perform and interpret key physical exam findings.
 - i. Assess for findings suggesting an underlying etiology, **e.g.**, papilledema, fever, neurologic deficits
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics and risks/costs of testing.
 - i. Use tests to determine underlying etiology, **e.g.**, CT without contrast, MRI, ESR
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, migraine, tension
 - ii. Consider not-to-miss diagnoses, **e.g.**, subarachnoid hemorrhage, hypertensive emergency, meningitis
 - iii. Consider causes of new-onset headache, **e.g.**, intracranial hemorrhage, giant cell arteritis
 - iv. Consider causes of chronic headache, **e.g.**, tension, analgesic overuse
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify treatments based on etiology, **e.g.**, abortive/prophylactic therapy for migraine or cluster headache, restrict non-prescription medications for withdrawal headaches

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the neurologic, vascular, musculoskeletal systems in the head and neck.

REFERENCES

- Douglas VC, Aminoff MJ. Headache. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.
- Rusiecki J. Headache. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e* New York, NY: McGraw-Hill.

HYPONATREMIA

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, treatment, and possible complications of hyponatremia.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine symptoms and relevant ROS, **e.g.**, altered mental status, seizures, diarrhea
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, lung cancer, CNS disease, heart failure, causative medications
- b. Perform and interpret key physical exam findings.
 - i. Determine severity, **e.g.**, mental status, seizure activity
 - ii. Assess for findings suggesting an underlying etiology, **e.g.**, hypotension, jugular venous distension, ascites
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Assess for cause, **e.g.**, corrected serum sodium, serum osmolality, urine osmolality
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, diarrhea, cirrhosis, syndrome of inappropriate antidiuretic hormone secretion
 - ii. Consider not-to-miss diagnoses, **e.g.**, lung cancer
- e. Develop a rational and evidence-based approach to treatment.
 - i. Describe treatments that control hyponatremia, **e.g.**, intravenous fluids (normal saline, hypertonic saline), water restriction, solute supplementation
 - ii. Describe treatments that prevent complications, **e.g.**, rate of sodium correction
- f. Describe possible complications, **e.g.**, osmotic demyelination syndrome due to rapid correction.

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the cardiac, renal, anti-diuretic hormone, and renin/angiotensin/aldosterone systems.

REFERENCES

Anker NB, Cho KC. Hyponatremia. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Spasovski G, Vanholder R, Allolio B et al. Clinical practice guideline on diagnosis and treatment of hyponatremia. *Intensive Care Med.* 2014; 40: 320-31.

Verbalis J, Goldsmith S, Greenberg A et al. Diagnosis, evaluation, and treatment of hyponatremia: expert panel recommendations. *Am J Med.* 2013; 126[Suppl 1]: S1-42.

JOINT PAIN

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of joint pain.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, acuity, joints involved, fever
 - ii. PMH: assess for risk factors, **e.g.**, antecedent trauma, concomitant rheumatologic disease, psoriasis
 - iii. SH: assess for risk factors, **e.g.**, unprotected sex, occupational history
- b. Perform and interpret key physical exam findings.
 - i. Determine type and extent of joint involvement, **e.g.**, affected joints, erythema, effusion, range of motion
 - ii. Assess for findings suggesting an underlying etiology, **e.g.**, fever, rash
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Perform tests in selected patients, **e.g.**, inflammatory markers, synovial fluid analysis, plain or advanced imaging
 - ii. Identify the need for urgent arthrocentesis, **e.g.**, presence of effusion
 - iii. Use lab tests judiciously, **e.g.**, rely on history and physical exam over imaging
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider the not-to-miss diagnoses, **e.g.**, septic arthritis
 - ii. Use an acuity and pattern-based approach, **e.g.**, acute monoarticular arthritis, chronic symmetrical polyarthritis
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify need for urgent treatment, **e.g.**, joint aspiration, parental antibiotics, hospitalization
 - ii. Identify indications for surgical consultation
 - iii. Describe treatment based on etiology, **e.g.**, acetaminophen for osteoarthritis, disease modifying antirheumatic drugs for rheumatoid arthritis

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the musculoskeletal system.

REFERENCES

Cifu A. Joint Pain. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence- Based Guide 4e* New York, NY: McGraw-Hill.

KNEE PAIN

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of knee pain.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, acuity, fever, other joint involvement
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, gout, osteoarthritis, causative medications
 - iii. FH: assess for heritable conditions, **e.g.**, hemochromatosis
- b. Perform and interpret key physical exam findings.
 - i. Determine presence of an underlying etiology, **e.g.**, presence of effusion, Lachman test
- c. Identify and interpret key laboratory and imaging testing including indications, benefits, test characteristics, and risks/costs of testing in a patient with knee pain.
 - i. Use testing to determine a cause in selected cases, **e.g.**, synovial fluid analysis, plain films
- d. Develop and prioritize a differential diagnosis for knee pain that includes common not-to-miss diagnoses.
 - i. Consider common causes, **e.g.**, osteoarthritis, crystalline disorders
 - ii. Consider common causes of peri-articular pain, **e.g.**, bursitis, iliotibial band syndrome
 - iii. Consider not-to-miss diagnoses, **e.g.**, fracture, septic arthritis
- e. Describe a rational and evidence-based treatment approach for patients with knee pain.
 - i. Treat based on etiology, **e.g.**, rest/ice/compression/elevation for acute knee injury, intravenous antibiotics for septic arthritis.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy of the knee.
- b. Describe the physiology and pathophysiology of articular and peri-articular pain.

REFERENCES

Cifu AS. Joint Pain. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence- Based Guide, 4e* New York, NY: McGraw-Hill.

Hochberg MC, Altman RD, April KT, et al. American College of Rheumatology 2012 recommendations for the use of nonpharmacologic and pharmacologic therapies in osteoarthritis of the hand, hip, and knee. *Arthritis Care & Research.* 2012; 64:465-474.

Knee Pain. In: Papadakis MA, McPhee SJ, Bernstein J. eds. *Quick Medical Diagnosis & Treatment 2020* New York, NY: McGraw-Hill.

https://www.aaos.org/cc_files/aaosorg/research/guidelines/treatmentofosteoarthritisofthekneeguideline.pdf

NOSOCOMIAL INFECTIONS

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, treatment, possible complications, and prevention of nosocomial infections.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, fever, diarrhea, cough
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, catheters, recent invasive procedures, causative medications
- b. Perform and interpret key physical exam findings.
 - i. Determine source of infection, **e.g.**, fever, altered mental status, rash
 - ii. Assess for risk factors and predisposing conditions, **e.g.**, indwelling bladder catheters, intravascular catheters
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine location of infection, **e.g.**, blood cultures, chest radiography, *Clostridium difficile* toxin assay
 - ii. Test for non-infectious diagnoses that mimic infection in select cases, **e.g.**, myocardial infarction, pulmonary embolus
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common infectious diagnoses, **e.g.**, urinary tract infection, pneumonia, *Clostridium difficile* colitis
 - ii. Consider non-infectious causes that mimic infection, **e.g.**, myocardial infarction, pulmonary embolism, medication-induced
- e. Describe a rational and evidence-based approach to treatment.
 - i. Identify when urgent treatments are needed, **e.g.**, systemic infection requiring antibiotics
 - ii. Describe how to use cultures and sensitivity to focus treatment
- f. Describe possible complications, **e.g.**, endocarditis, septic thrombophlebitis.
- g. Describe the prevention of nosocomial infections, **e.g.**, handwashing, intravascular catheter management, antibiotic stewardship.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the etiology and epidemiology of nosocomial infections.
- b. Describe the mechanisms of antibiotic resistance for common bacterial causes of nosocomial infections.

REFERENCES

Chin-Hong PV, Guglielmo B. Health Care-Associated Infections. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

Guh AY, Kuty PK. Clostridioides difficile Infection. *Ann Intern Med.* 2018; 169(7): ITC49-ITC64. Monegro AF, Regunath H. Hospital Acquired Infections. *StatPearls.* Dec 16, 2019.

OBESITY

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of overweight and obesity.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI:
 1. Determine characteristics and relevant ROS, **e.g.**, prior efforts to achieve weight loss, physical activity patterns, eating patterns
 2. Assess for complications, **e.g.**, sleep patterns, leg swelling, joint pain
 - ii. PMH:
 1. Determine risk factors and predisposing conditions, **e.g.**, eating disorders/disordered eating patterns, body image disturbance, causative medications
 2. Assess for weight-related comorbidities, **e.g.**, obstructive sleep apnea, hypertension, non-alcoholic fatty liver disease
 - iii. FH: assess for a family history of overweight or obesity
 - iv. SH: determine risk factors, **e.g.**, sedentary job, lower socioeconomic status
- b. Perform and interpret key physical exam findings.
 - i. Evaluate for findings suggesting an underlying etiology, **e.g.**, central obesity, striae, hirsutism
 - ii. Evaluate for findings suggesting complications, **e.g.**, hypertension, venous stasis
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine etiology in select patients, **e.g.**, thyroid studies, complete blood count, cortisol level
 - ii. Assess for complications, recommended in most patients, **e.g.**, fasting glucose, fasting lipid panel
 - iii. Assess for complications, recommended in selected patients, **e.g.**, polysomnography, pulmonary function studies, liver biopsy
- d. Describe a rational and evidence-based approach to treatment.
 - i. Describe methods that help patients identify eating and activity habits, **e.g.**, behavioral counseling, self-monitoring, goal-oriented approach to weight loss
 - ii. Describe modified eating habits, **e.g.**, restricted diet, meal replacements, intermittent fasting
 - iii. Describe methods to modify physical activity, **e.g.**, prescription for dedicated exercise
 - iv. Describe how to utilize anti-obesity pharmacotherapy or surgical intervention
 - v. Describe how to manage weight-related comorbidities, **e.g.**, avoid medications associated with weight gain

2. Relevant medical knowledge from preclinical instruction

- a. Describe the epidemiology and determinants of overweight and obesity.
- b. Describe the physiology of normal weight and pathophysiology of obesity.
- c. Describe general concepts of nutrition and physical activity.

REFERENCES

- George, B. and Bouchard, C. ed. *Handbook of Obesity: Clinical Applications, Volume 1*. 4th ed. Boca Raton, FL: Taylor & Francis Group, LLC; 2014.
- George, B. and Bouchard, C. ed. *Handbook of Obesity: Clinical Applications, Volume 2*. 4th ed. Boca Raton, FL: Taylor & Francis Group, LLC; 2014.
- Pignone M, Salazar R. Prevention of Overweight & Obesity. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.
- Saunders KH, Igel LI, Baron RB. Obesity. In: Papadakis MA, McPhee SJ, Rabow MW. eds. *Current Medical Diagnosis and Treatment 2020* New York, NY: McGraw-Hill.

SKIN AND SOFT TISSUE INFECTIONS

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, treatment, and possible complications of skin and soft tissue infections.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine symptom characteristics and relevant ROS, **e.g.**, timing, associated pain and fevers, recent skin barrier disruption
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, diabetes, intravenous drug use, peripheral arterial disease
- b. Perform and interpret key physical exam findings.
 - i. Determine severity, **e.g.**, erythema, fluctuance/purulence, crepitus
 - ii. Assess for findings suggesting an alternate etiology, **e.g.**, calf pain, edema, hemosiderin deposition
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, risks/costs of testing.
 - i. Determine cause in select patients, **e.g.**, blood cultures
 - ii. Determine severity in select cases, **e.g.**, complete blood count, lactate, CT scan
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, cellulitis, abscess
 - ii. Consider not-to-miss diagnoses, **e.g.**, necrotizing fasciitis, streptococcal toxic shock syndrome
 - iii. Consider commonly confused diagnoses, **e.g.**, arterial insufficiency, venous stasis, deep venous thrombosis
- e. Develop a rational and evidence-based approach to treatment.
 - i. Identify empiric antibiotic therapy based on risk factors, **e.g.**, diabetes, MRSA risk factors, water exposure
 - ii. Identify the need for parental antibiotics and hospitalization
 - iii. Describe indications for surgical consultation, **e.g.**, suspected necrotizing fasciitis, abscess
- f. Describe possible complications, **e.g.**, failure to respond to first-line antibiotics.

2. Relevant medical knowledge from preclinical instruction

- a. Describe the epidemiology, pathophysiology, predisposing factors, and microbiology of skin and soft tissue infections.

REFERENCES

- Bystritsky R, Chambers H. Cellulitis and Soft Tissue Infections. *Ann Intern Med.* 2018; 168: ITC17- ITC32.
- Raff AB, Kroshinsky D. Cellulitis: A Review. *JAMA.* 2016; 316: 325-37.
- Stevens DL, Bisno AL, Chambers HF, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. *Clin Infect Dis.* 2014; 59: e10-52.

SKIN LESIONS

END OF CLERKSHIP GOAL

Students should be able to explain the evaluation and differential diagnosis of skin lesions and be able to determine whether a patient has a primary cutaneous disorder or a cutaneous manifestation of a systemic disease.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, location, duration, progression, exposures, systemic symptoms
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, rheumatologic disease, infection, recent medications
 - iii. SH: assess for risk factors and predisposing conditions, **e.g.**, occupational exposures
- b. Perform and interpret key physical examination findings.
 - i. Describe skin lesions by standard nomenclature (**e.g.**, macule, papule, vesicle) and additional characteristics (**e.g.**, location, color)
 - ii. Distinguish primary from secondary lesions, **e.g.**, lichenification, scar
 - iii. Describe potentially malignant lesions using the **ABCDE** mnemonic (**A**symmetry, **B**order, **C**olor, **D**iameter, **E**volution).
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Use testing to determine cause in most patients, **e.g.**, skin biopsy
 - ii. Use testing to determine cause in selected patients, **e.g.**, bacterial culture, potassium hydroxide preparation, Tzanck smear
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, contact dermatitis, eczema, herpes zoster
 - ii. Consider presence of underlying systemic disease, **e.g.**, inflammatory bowel disease, lupus
 - iii. Consider not-to-miss diagnoses, **e.g.**, Stevens-Johnson syndrome (SJS), toxic epidermal necrolysis (TEN), melanoma

2. Relevant Medical Knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the skin.

REFERENCES

- Goldsmith LA, et al, eds. *Fitzpatrick's Dermatology in General Medicine, 8th ed.* New York, McGraw-Hill, 2012.
- Stein S. Rash. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e.* New York, NY: McGraw-Hill.
- Yancey KB, Lawley TJ. Approach to the Patient with a Skin Disorder. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J. eds. *Harrison's Principles of Internal Medicine, 20e.* New York, NY: McGraw-Hill.

SYNCOPE

END OF CLERKSHIP GOALS

Students should be able to explain the evaluation, differential diagnosis, and treatment of syncope.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics of the event and relevant ROS, **e.g.**, position at onset, prodromal symptoms, situational triggers
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, coronary artery disease, structural heart disease
 - iii. FH: assess for familial disorders, **e.g.**, sudden cardiac death, high-risk arrhythmia
- b. Perform and interpret key physical exam findings.
 - i. Evaluate for findings suggesting an underlying etiology, **e.g.**, orthostatic vital signs, S3, jugular venous distension
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics and risks/costs of testing.
 - i. Use testing to determine an underlying cause in most patients, **e.g.**, blood glucose, electrocardiogram
 - ii. Use testing to identify an underlying cause in selected patients, **e.g.**, echocardiogram
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Discriminate syncope from other causes of transient loss of consciousness, **e.g.**, hypoglycemia, seizure
 - ii. Determine probability of cardiac syncope using a validated risk prediction model, **e.g.**, EGSYS score
 - iii. Consider causes according to underlying mechanism, **e.g.**, orthostatic hypotension, reflex syncope, cardiac syncope
 - iv. Consider common diagnoses, **e.g.**, orthostatic hypotension, reflex syncope
 - v. Consider not-to-miss diagnoses, **e.g.**, ventricular tachycardia, pulmonary embolism, shock
- e. Describe a rational and evidence-based approach to treatment.
 - i. Treat based on etiology, **e.g.**, anticoagulation or thrombolysis in pulmonary embolism

2. Relevant medical knowledge from preclinical instruction

- a. Describe the anatomy, physiology, and pathophysiology of the pulmonary, cardiac, and vascular systems.
- b. Describe the physiology and pathophysiology of the vagal reflex.

REFERENCES

Madeira CL, Craig MJ, Donohoe A, Stephens JR. Things we do for no reason: Echocardiogram in unselected patients with syncope. *J Hosp Med* 2017; 12: 984-988.

Puppala VK, Dickinson O, Benditt DG. Syncope: classification and risk stratification. *J Cardiol*. 2019; 63:171-177.

Stern SC. Syncope. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e* New York, NY: McGraw-Hill.

UNINTENTIONAL WEIGHT LOSS

END OF CLERKSHIP GOAL

Students should be able to explain the evaluation, differential diagnosis, and treatment of unintentional weight loss.

LEARNING OBJECTIVES

1. Patient Care

- a. Obtain and interpret key historical features.
 - i. HPI: determine characteristics and relevant ROS, **e.g.**, anorexia, time course, degree of weight loss, fever
 - ii. PMH: assess for risk factors and predisposing conditions, **e.g.**, history of malignancy, tuberculosis
 - iii. SH: assess for risk factors and predisposing conditions, **e.g.**, tobacco use, social isolation, socioeconomic status
- b. Perform and interpret key physical exam findings.
 - i. Evaluate for findings characteristic of weight loss, **e.g.**, Body Mass Index, cachexia, sarcopenia
 - ii. Evaluate for findings suggesting an underlying etiology, **e.g.**, fever, masses
- c. Identify and interpret key laboratory and imaging testing and list indications, benefits, test characteristics, and risks/costs of testing.
 - i. Use testing to determine cause in most patients, **e.g.**, complete blood count, chemistry panel, TSH, age-appropriate cancer screening
 - ii. Use testing to determine cause in select patients, **e.g.**, inflammatory markers, advanced imaging, HIV, hepatitis C
- d. Develop and prioritize a differential diagnosis including common and not-to-miss diagnoses.
 - i. Consider common diagnoses, **e.g.**, loss of taste/smell, social isolation, thyroid disease
 - ii. Consider not-to-miss diagnoses, **e.g.**, malignancy, HIV
- e. Describe a rational and evidence-based approach to treatment.
 - i. Describe treatment based on etiology, **e.g.**, antivirals for HIV, medication for depression
 - ii. Identify appropriate indications for, and risks of, enteral or parenteral feeding, caloric supplements, and pharmacologic adjuncts for appetite stimulation/weight gain

2. Relevant medical knowledge from preclinical instruction

- a. Know the anatomy, physiology, and pathophysiology of weight and appetite regulation, energy absorption, cachexia, and catabolism, as well as normal age-related changes.
- b. Define unintentional weight loss, describe its prevalence, and list the common associated comorbidities and complications.

REFERENCES

Bosch X, Monclus E, Escoda O, et al. Unintentional weight loss: Clinical characteristics and outcomes in a prospective cohort of 2677 patients. *PLoS ONE*. 2017; 12(4): e0175125.

Gaddey HL and Holder K. Unintentional weight loss in older adults. *Am Fam Physician* 2014; 89 (9): 718-722.

Olson A. Unintentional Weight Loss. In: Stern SC, Cifu AS, Altkorn D. eds. *Symptom to Diagnosis: An Evidence-Based Guide, 4e* New York, NY: McGraw-Hill.

Wong, CJ. Involuntary weight loss. *Med Clin N Am* 2014; 98: 625-643.

US Preventive Services Task Force Cancer Screening recommendations: <https://www.uspreventiveservicestaskforce.org/>

CORE COMPETENCIES

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ADVANCED IMAGING

RATIONALE

Selected advanced imaging, including ultrasonography, computer tomography (CT), and magnetic resonance imaging (MRI), play a crucial role in the diagnosis and management of patients. It includes knowing the indications, contraindications, risks, benefits, test characteristics, and interpretation in order to provide evidence-based, patient-centered, and cost-effective patient care.

Internal Medicine rotations should introduce concepts to medical students and may provide opportunities for students to practice these skills.

LEARNING OBJECTIVES

Knowledge

1. Identify the risks, benefits, and test characteristics of ultrasound, CT, and MRI.
2. List the indications and contraindications for ultrasound, CT, and MRI for commonly encountered clinical presentations, e.g., right upper quadrant pain, suspected pulmonary embolism, acute hip pain with negative radiographs.
3. List the indications and contraindications for use of contrast CT and MRI.
4. Identify clinical scenarios where advanced imaging results should be discussed with a radiologist.

Skills

1. Recognize different sequences on MRI.
2. Identify different windows on CT images.
3. Identify structures of various tissue characteristics on ultrasound.
4. Review ultrasound, CT, and MRI images using a systematic approach with search patterns.
5. Review and discuss ultrasound, CT, and MRI images with a radiologist.

Attitudes

1. Express appreciation for the role of the radiologist in the healthcare team.
2. Acknowledge that review of advanced imaging with a radiologist is beneficial to patient care.

REFERENCES

American College of Radiology Appropriateness Criteria. <https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria>

Learning Radiology. www.learningradiology.com

BASIC LABS

RATIONALE

Understanding laboratory tests is fundamental to physician practice, requiring integration of basic science with knowledge of core clinical content. Students need to learn when to order laboratory tests and how to interpret results based on the clinical presentation. Students should also understand laboratory test characteristics, indications, benefits, risks, and costs of testing. Determining how test results influence clinical decision making and communicating this information to patients are essential clinical skills.

Internal Medicine rotations should:

1. Reinforce concepts previously introduced to medical students.
2. Provide opportunities to practice skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. List the test characteristics, indications, benefits, risks, and costs for common laboratory tests including:
 - a. Serum chemistries, **e.g.**, serum electrolytes, hepatic function tests, cardiac enzymes
 - b. Hematology tests, **e.g.**, complete blood cell counts, coagulation studies
 - c. Endocrine studies, **e.g.**, lipid panel, thyroid function tests, hemoglobin A1c
 - d. Microbiology tests, **e.g.**, blood cultures, streptococcal rapid antigen detection test
 - e. Urine tests, **e.g.**, urinalysis, urine electrolytes
 - f. Body fluid studies, **e.g.**, pleural fluid, peritoneal fluid
2. Describe rationale behind ordering tests, **e.g.**, diagnosis, screening, monitoring disease, therapy.
3. Identify the different urgencies of testing, **e.g.**, routine, stat.
4. List potential sources of error in testing, **e.g.**, preanalytical, analytical, postanalytical.
5. Identify commonly used metrics to determine validity of test results, **e.g.**, sensitivity, specificity, positive predictive value, negative predictive value.

Skills

1. Interpret the results of common laboratory tests in the context of the patient's clinical presentation.
2. Incorporate pre-test probability of disease, test characteristics, and post-test probability of disease into clinical decision making.
3. Recognize critical laboratory values that identify life- and function-threatening diagnoses.
4. Analyze trends in specific values and minimize reliance on a single, abnormal value.
5. Consider the implications of test results prior to ordering.

Attitudes

1. Commit to using risk-benefit, cost-benefit, and evidence-based approaches in the selection of diagnostic laboratory testing.
2. Commit to personal and professional development by engaging in opportunities to directly review test results when indicated, **e.g.**, gram stains, blood smears, urine microscopy

REFERENCES

Entrustable Professional Activities for Entering Residency #3: Recommend and Interpret Common Diagnostic and Screening Tests. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency*. Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations

Jaeschke R, Guyatt G, Sackett DL. Users' guides to the medical literature. III. How to use an article about a diagnostic test. A. Are the results of the study valid? *JAMA*. 1994; 271:389-91.

Jaeschke R, Guyatt G, Sackett DL. 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? *JAMA*. 1994; 271: 703-7.

Killeen AA. Chapter S12: The Clinical Laboratory in Modern Health Care. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J. eds. *Harrison's Principles of Internal Medicine*. 20th ed. New York: McGraw-Hill; 2018.

Lab Test Online
www.labtestsonline.org/

Laposata M. Chapter 1: Concepts in Laboratory Medicine. In: Laposata M. eds. *Laposata's Laboratory Medicine: Diagnosis of Disease in the Clinical Laboratory*, 3rd ed. New York: McGraw-Hill; 2019.

Pincus MR, Abraham NZ. Chapter 8: Interpreting Laboratory Results. In: *Henry's Clinical Diagnosis and Management by Laboratory Methods*, 23rd ed. St. Louis: Elsevier; 2017.

CASE PRESENTATION

RATIONALE

The oral case presentation is a fundamental component of physician-physician communication, important for both patient care and clinical education. It relies heavily on collecting, organizing, and synthesizing clinical information. The case presentation requires knowledge of disease, clinical reasoning skills (clinically centered), and rhetorical skills (context-centered) to facilitate evidence-based, patient-centered, efficient, and effective patient care.

Internal Medicine rotations should:

1. Reinforce concepts previously introduced to medical students.
2. Provide opportunities for students to practice skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. Identify the types of presentations commonly used for clinical encounters, e.g., admission presentation, problem focused outpatient presentation.
2. Identify components of common types of presentations, e.g., comprehensive presentation, problem-focused presentation.
3. Describe how the clinical reasoning process can assist in determining the relevance of clinical information in a presentation.
4. Describe how context impacts the content of a presentation, e.g., in the presence of the patient, including members of the interprofessional team.

Skills

1. Adapt the presentation to fit the needs of the receiver and clinical setting, e.g., in the presence of the patient, for purposes of consultation.
2. Include components of the patient presentation that are pertinent to the assessment and plan, e.g., history of present illness, past history, physical exam, laboratory values, imaging studies.
3. Involve the patient, family, and other healthcare professionals in the presentation process, eliciting preferences, and communicating plans and results.
4. Include the following when a complete assessment and plan is necessary:
 - a. A complete prioritized problem list.
 - b. A summary statement/problem representation that includes key details from the patient's presentation.
 - c. A prioritized and supported differential diagnosis for each of the problems.
 - d. A comprehensive and detailed plan.
5. Communicate findings in an organized, fluid, and confident fashion.
6. Engage the patient by actively soliciting their feedback on accuracy and completeness of presented information.

Attitudes

1. Show respect for patients, family members, and members of the healthcare team in presentations.
2. Accept that excellent presentations require preparation, practice, and adjustments based on feedback.
3. Acknowledge the lack of a 'perfect presentation structure' to fit every clinical context.
4. Acknowledge that a successful presentation is dependent on the ability to collect, interpret, and organize patient data.

REFERENCES

Entrustable Professional Activities for Entering Residency #6: Provide an Oral Presentation of a Clinical Encounter. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency*. Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations

Green EH, Durning SJ, DeCherrie L, Fagan MJ, Sharpe B, Hershman W. Expectations for oral case presentations for clinical clerks: opinions of internal medicine clerkship directors. *J Gen Intern Med*. 2009 Mar;24(3):370-3.

Green EH, DeCherrie L, Fagan MJ, Sharpe BA, Hershman W. The oral case presentation: what internal medicine clinician-teachers expect from clinical clerks. *Teach Learn Med*. 2011 Jan;23(1):58-61.

Haber RJ, Lingard LA. Learning oral presentation skills: a rhetorical analysis with pedagogical and professional implications. *J Gen Intern Med*. 2001;16:308-14.

CHEST RADIOGRAPH INTERPRETATION

RATIONALE

Chest radiographs are a common imaging study for the evaluation of a diverse array of conditions encountered in both the inpatient and outpatient setting. Understanding the indications for testing, anatomic positioning on the radiograph, and interpretation of both normal and abnormal findings is crucial to the care of adult patients.

Internal Medicine rotations should:

1. Introduce concepts to medical students.
2. Provide opportunities for students to practice skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. List the indications and contraindications for obtaining a chest radiograph.
2. Describe a systematic approach to chest radiograph interpretation.
3. List the differential diagnoses for common abnormalities on a chest radiograph, e.g., pleural effusion, lobar opacity.
4. List the test characteristics of common abnormalities found on the chest radiograph, e.g., pulmonary vascular congestion for volume overload.

Skills

1. Identify markers of chest radiograph quality, e.g., inspiratory effort, penetration.
2. Identify the radiographic view obtained, e.g., anterior-posterior, posterior-anterior, lateral.
3. Use a standardized approach to chest radiograph interpretation.
4. Identify anatomic landmarks on a chest radiograph, e.g., cardiac silhouette, lung fissures.
5. Identify common abnormalities on a chest radiograph, e.g., cardiomegaly, pleural effusion, interstitial changes.
6. Incorporate chest radiograph findings into Bayesian reasoning to determine post-test probability for a given diagnosis.

Attitudes

1. Appreciate the importance of personal chest radiograph interpretation in conjunction with formal interpretations by trained radiologists.
2. Acknowledge the uncertainties inherent to chest radiograph interpretation.

REFERENCES

Expert Panel on Thoracic Imaging. McComb BL, et al. Routine Chest Radiography. American College of Radiology Appropriateness Criteria. <https://acsearch.acr.org/docs/69451/Narrative/>

King C, Sweigart J, Restauri N, Zehnder, N. Chest Radiograph Interpretation: A Flipped Classroom Approach. https://www.mededportal.org/doi/full/10.15766/mep_2374-8265.10339

Smithuis R, van Delden O. Chest: Chest X-Ray Index Basic Interpretation. The Radiology Assistant. <https://radiologyassistant.nl/chest/chest-x-ray/basic-interpretation>

COLLABORATION

RATIONALE

Solving complicated care problems and providing necessary services requires effective, efficient teamwork. Interprofessional collaboration and education occurs when “students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes” according to the World Health Organization. Interprofessional colleagues may include nurses, pharmacists, physical therapists, and social workers to name a few. Intraprofessional collaboration describes the interaction between individuals within the same profession such as peer students, consultants, or residents. There is broad consensus regarding the importance of teamwork across medical student, training physician and practicing physician organizations.

Internal Medicine rotations should introduce concepts to medical students and provide opportunities for students to practice these skills. Internal Medicine rotations may also assess concepts during the rotation.

Many of the objectives below are derived from the Entrustable Professional Activities for Entering Residency #9: Collaborate as a Member of an Interprofessional Team. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency. Washington, DC: Association of American Medical Colleges; 2017.

www.aamc.org/initiatives/coreepas/publicationsandpresentations

LEARNING OBJECTIVES

Knowledge

1. Define intraprofessional collaboration.
2. Define interprofessional collaboration.
3. Identify team member roles and responsibilities, e.g., social worker, registered dietician, nurse case manager.

Skills

1. Communicate and work effectively with colleagues, other healthcare professionals, and health related agencies in a responsive and responsible manner that supports health and the treatment of disease in individual patients and populations.
 - a. Use attentive listening skills when communicating with team members.
 - b. Adjust communication content and style to align with team-member communication needs.
 - c. Include team members in all relevant information exchange.
2. Demonstrate effective communication skills when relaying appropriate patient information to consultants.

Attitudes

1. Cooperate with other healthcare professionals to establish and maintain a climate of mutual respect, dignity, diversity, ethical integrity, and trust.
2. Show respect for and appreciate the contributions of all members of the team, e.g., patient, family, healthcare professionals.

REFERENCES

- Berger-Estilita J, Fuchs A, Hahn M, Chiang H, Greif R. Attitudes Towards Interprofessional Education in the Medical Curriculum: A Systematic Review of the Literature. *BMC Med Educ.* 2020; 20(1):254.
- Bridges DR, Davidson RA, Odegard PS, Maki IV, Tomkowiak J. Interprofessional Collaboration: Three Best Practice Models of Interprofessional Education. *Med Educ Online.* 2011; 16: 10.3402/meo.v16i0.6035.
- Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a Common Taxonomy of Competency Domains for the Health Professions and Competencies for Physicians. *Acad Med.* 2013; 88(8):1088-94.
- EPA 9: Collaborate as a Member of an Interprofessional Team. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency.* Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations
- Framework for Action on Interprofessional Education and Collaborative Practice https://www.who.int/hrh/resources/framework_action/en/
- Havyer R, Nelson DR, Wingo MT, Comfere NI, Halvorsen AJ, McDonald F, Reed DA. Addressing the Interprofessional Collaboration Competencies of the Association of American Medical Colleges: A Systematic Review of Assessment Instruments in Undergraduate Medical Education. *Acad Med* 2016; 91:865-88.
- Leedham-Green KE, Knight A, Iedema R. Intra- And Interprofessional Practices Through Fresh Eyes: A Qualitative Analysis of Medical Students' Early Workplace Experiences. *BMC Med Educ.* 2019; 19: 287.
- Tran C, Toth-Pal E, Ekblad S, Fors U, Salminen H. A Virtual Patient Model for Students' Interprofessional Learning in Primary Healthcare. *PLoS One.* 2020; 15:e0238797.

DIAGNOSTIC DECISION-MAKING

RATIONALE

The diagnostic evaluation of patients with symptoms, physical signs, laboratory, or imaging findings is a key responsibility of physicians. The diagnostic process requires patient communication skills, knowledge of disease, interprofessional teamwork, familiarity with diagnostic testing modalities and test characteristics, and an understanding of human cognitive processes and limitations. The diagnostic process includes designing and implementing diagnostic approaches individual to specific patients that emphasize high-value care, minimize patient risk, limit the possibility of error, and have a high likelihood of success.

Internal Medicine rotations should:

1. Introduce concepts to medical students.
2. Provide opportunities for students to practice skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. List the cognitive concepts that underlie the diagnostic process, e.g., pattern recognition, analytical reasoning, problem representation, illness scripts, and bias.
2. Describe diagnostic tools that assist in the diagnostic process, e.g., algorithms, clinical decision tools, clinical guidelines.
3. Define and interpret key statistical measures, e.g., pre-test probability, post-test probability, likelihood ratios.
4. List the determinants of the pre-test probability of a disease, e.g., clinical findings, clinical gestalt, prediction rules.
5. Describe the relationship between the post-test probability and the threshold to test or treat.
6. List factors that commonly contribute to diagnostic error, e.g., patient-based, physician-based, environmental.
7. State the role that systems-based factors play in the diagnostic process.

Skills

1. Apply cognitive concepts and diagnostic decision tools to develop a differential diagnosis.
2. Use knowledge of test characteristics and pretest probability to determine post-test probability of disease.
3. Utilize the concepts of threshold to test and threshold to treat to determine when further testing or treatment is indicated.
4. Use diagnostic approaches that are based on high-value care principles, minimize cost and patient risk, and limit the possibility of error.
5. Involve the patient, family, and the healthcare team in the diagnostic process, e.g., eliciting preferences, communicating results.

Attitudes

1. Acknowledge the uncertainty and fallibility inherent to the diagnostic process and the effect this may have on the patient, family, and healthcare team.
2. Accept that diagnostic excellence requires hard work, frequent feedback, and the ability to tolerate uncertainty.

REFERENCES

Bowen JL. Educational Strategies to Promote Clinical Diagnostic Reasoning. *N Engl J Med*. 2006; 355(21):2217-25.

Eva KW. What Every Teacher Needs to Know About Clinical Reasoning. *Med Educ*. 2005; 39(1):98-106. Erratum in: *Med Educ*. 2005; 39(7):753.

Clinical Reasoning Educators' Toolkit. Society to Improve Diagnosis in Medicine; <https://www.improvediagnosis.org/clinical-reasoning-toolkit-educator-resources/>

ELECTROCARDIOGRAM INTERPRETATION

RATIONALE

Heart disease continues to be the leading cause of hospital admissions and mortality in the United States. The 12-lead electrocardiogram (ECG) is one of the most widely used diagnostic tests in medicine, both in the inpatient and outpatient settings. It is an important component of the evaluation of patients presenting with multiple concerns, including chest pain and dyspnea, and is of crucial importance detecting emergent and non-emergent medical conditions, such as acute coronary syndrome and various cardiac arrhythmias. The ECG results may critically alter a patient's diagnosis, treatment, and prognosis and the accurate interpretation of ECGs is a fundamental skill expected of all medical graduates.

Internal Medicine rotations should:

1. Introduce concepts to medical students.
2. Provide opportunities for students to practice skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. List the indications for electrocardiography.
2. List causes of common abnormalities found on the ECG, e.g., ST-segment changes, prolonged QT interval, T wave changes, conduction abnormalities.
3. List the ECG changes seen with common electrolyte imbalances, e.g., hyperkalemia, hypokalemia, hypocalcemia, hypomagnesemia.

Skills

1. Demonstrate a systematic approach to ECG interpretation.
2. Use an ECG caliper to measure intervals and determine the rhythm.
3. Accurately measure atrial and ventricular rates on a 12-lead ECG and on a telemetry strip.
4. Interpret basic components of the ECG, e.g., rate, rhythm, intervals, axis, waveforms.
5. Identify common rhythm abnormalities, e.g., ectopic beats, atrial fibrillation, ventricular tachycardia.
6. Identify common atrioventricular and conduction delays, e.g., second degree heart block, left bundle branch block.
7. Identify common chamber abnormalities, e.g., left atrial enlargement, left ventricular hypertrophy.
8. Identify changes consistent with myocardial ischemia/infarction, e.g., ST-elevation, ST-depression, T wave inversion.
9. Identify changes consistent with pericardial disease, e.g., ST-elevation, PR-depression, electrical alternans

Attitudes

1. Appreciate the importance of personal interpretation of ECGs in conjunction with formal interpretations performed by cardiologists.
2. Acknowledge the uncertainties inherent to ECG interpretation.

REFERENCES

- Antiperovitch P, Zareba W, Steinberg JS, Bacharova L, Tereshchenko L, Farre J, Nikus K, Ikeda T, Baranchuk A. Proposed In-Training Electrocardiogram Interpretation Competencies for Undergraduate and Postgraduate Trainees. *J Hosp Med.* 2018;13(3):185-193.
- Jablonover RS, Lundberg E, Zhang, Y, Stagnaro-Green A. Competency in Electrocardiogram Interpretation Among Graduating Medical Students. *Teach Learn Med.* 2014;26(3):279-284.
- O'Keefe JH, Hammill SC, Freed MS. *The Complete Guide to ECGs* 4th edition. Jones & Bartlett Learning, 2016.

ELECTRONIC HEALTH RECORDS

RATIONALE

With the passage of recent regulations, the electronic health record (EHR) became a necessary tool in patient care and healthcare delivery. Leveraging the EHR in a way that is both thoughtful and efficient is an essential skill for clinical practice, with implications for the care of individual patients, population health, and provider satisfaction. Effective use of the EHR requires skill building in data acquisition and interpretation as well as an understanding of the impact of EHR use on the overall quality of the information stored within the system.

Internal Medicine rotations should introduce concepts to medical students and provide opportunities for students to practice these skills. Internal Medicine rotations may also assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. Describe how the EHR can facilitate patient care and population health.
2. Explain potential limitations of the EHR and how these may impact care.
3. Discuss the role of the EHR in patient safety, including risks and benefits.
4. List best practices for safe, high quality documentation including the avoidance of potential pitfalls, e.g., note bloat, copy-paste.

Skills

1. Use the EHR to gather key data about each patient's history and clinical status.
2. Demonstrate the ability to integrate the EHR into patient care while maintaining focus on the patient.
3. Maintain accurate documentation while using efficiency tools within the EHR, e.g., note templates, automated documentation tools.
4. Plan and review clinical care and make decisions with reference to EHR data.
5. Practice computerized provider order entry in an appropriately supervised fashion, e.g., e-prescribing, ordering laboratory and radiologic studies.
6. Show respect for patient privacy and consent when accessing and sharing EHR data.

Attitudes

1. Appreciate the value of understanding and optimizing personal use of the EHR as a key tool in clinical care.
2. Acknowledge the importance of validating information in the patient record and responding to clinical decision support in a thoughtful manner.
3. Realize that the EHR and other advanced technologies can amplify bias and exacerbate existing healthcare disparities.
4. Take responsibility for providing feedback when issues or optimization opportunities are identified within the EHR.

REFERENCES

Biagioli FE, Elliot DL, Palmer RT, Graichen CC, Rdesinski RE, Kumar KA, Galper AB, Tysinger JW. The electronic health record objective structured clinical examination: Assessing student competency in patient interactions while using the electronic health record. *Acad Med.* 2017; 92(1): 87-91.

Pontefract SK, Wilson K. Using electronic patient records: Defining learning outcomes for undergraduate education. *BMC Medical Education.* 2019; 19: 30.

Zavodnick J, Kouvatso T. Electronic health record skills workshop for medical students. *MedEdPORTAL.* 2019; 15:10849.

HEALTH EQUITY AND SOCIAL DETERMINANTS OF HEALTH

RATIONALE

Health equity means that everyone has a fair and just opportunity to be as healthy as possible. Health equity requires focused and sustained societal efforts to confront historical and contemporary injustices and eliminate health disparities. It is a commitment to reducing and eliminating health disparities and their determinants. A majority of racial and ethnic health inequities result from social structures and policies that are unequal. Health disparities are systematic, conceivably avoidable health differences associated with discrimination or marginalization. Health disparities are the metric we use to measure progress toward achieving health equity. Medical students should learn about health literacy, how to bridge cultural gaps, and how to advocate for patients and populations. It is also important for students to have dedicated time and a safe place to reflect upon their experiences.

Internal Medicine rotations should introduce concepts and provide opportunities to practice these skills. Internal medicine rotations may also assess concepts.

LEARNING OBJECTIVES

Knowledge

1. Explain that social determinants of health are conditions in which people are born, grow, work, and age, and they are associated with substantially different health outcomes.
2. Define health equity and how it is influenced by different types of social determinants.
3. Define the social, political, environmental, educational, and economic determinants of health.
4. Identify health and social inequities in the clinical setting and recognize their impact on distribution of disease and illness across population groups.
5. Describe how healthcare professionals, health systems and communities can address and engage in eliminating the influence of social determinants on health outcomes.
6. Define explicit and implicit (unconscious) bias and identify real-life examples.
7. Define strategies to determine and address health literacy.

Skills

1. Accurately identify the social determinants of health during a clinical encounter.
2. Ask about and address social stressors during a clinical encounter.
3. Formulate assessments and plans that include risk assessment, prevention, and social intervention.
4. Promote preventive medicine by addressing physical, mental and spiritual health, and connecting patients with available resources.
5. Use health literacy techniques to ensure patients and families better understand health information.
6. Communicate effectively in a culturally respectful manner.
7. Recognize and appropriately address explicit and implicit biases in healthcare delivery.
8. Develop strategies to mitigate one's own implicit biases in patient interactions.
9. Identify the need for and use appropriate language translation services.

REFERENCES

- Health and Well-Being for All. CDC Foundation website. <https://www.cdcfoundation.org/health-in-a-box>
- Health Equity Guide <https://healthequityguide.org/>
- Health Equity Curricular Toolkit <https://www.aafp.org/family-physician/patient-care/the-everyone-project/health-equity-tools.html>
- Kaprielian VS, Silberberg M, McDonald MA, Koo D, Hull SK, Murphy G, Tran AN, Sheline BL, Halstater B, Martinez-Bianchi V, Weigle NJ, De Oliveira JS, Sangvai D, Copeland J, Tilson HH, Scutchfield FD, Michener JL. Teaching Population Health: A Competency Map Approach to Education. *Acad Med.* 2013; 88:626-637.
- Koh HK, Piotrowski JJ, Kumanyika S, Fielding JE. Healthy people: A 2020 vision for the social determinants approach. *Health Educ Behav.* 2011; 38:551-557.
- Martinez-Bianchi V, Frank B, Edgoose J, Michener L, Rodriguez M, Gottlieb L, Reddick B, Kelly C, Yu K, Davis S, Carr J, Lee JW, Smith KL, New RD, Weida J. Addressing family medicine's capacity to improve health equity through collaboration, accountability, and coalition-building. *Fam Med.* 2019; 51(2):198-203.
- Stuart G. What is asset-based community development (ABCD)? Sustaining Community Blog. <https://sustainingcommunity.wordpress.com/2013/08/15/what-is-abcd>
- Unnatural Causes: Is Inequality Making Us Sick? <https://unnaturalcauses.org>
- Wyatt R, Laderman M, Botwinick L, Mate K, Whittington J. *Achieving Health Equity: A Guide for Health Care Organizations.* IHI White Paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2016. <http://www.ihf.org/resources/Pages/IHIWhitePapers/Achieving-Health-Equity.aspx>

HEALTH EQUITY AND SOCIAL DETERMINANTS OF HEALTH

CONTINUED

Attitudes

1. Commit to caring for all patients.
2. Commit to identifying effective solutions to achieving health equity.
3. Acknowledge responsibility when inadvertently not addressing health equity in the delivery of health care.
4. Commit to leading and collaborating with others to improve health for all patients.
5. Show respect for diverse cultural values and traditions for the communities being served.
6. Show respect for the manner in which people of diverse cultures and belief systems perceive health and illness and respond to various symptoms, diseases, and treatments.

HISTORY

RATIONALE

The patient's history guides the hypothesis-driven approach to diagnosis. Gathering the history is a key responsibility of the physician and it requires communication skills, knowledge of disease, awareness of the social determinants of health, and understanding of the values that define the patient's sense of well-being. The history should be patient centered, so it includes the patient's experience as well as their concerns, feelings, and emotions in the context of their own signs and symptoms. The clinician's responsibility is to allow the patient to tell their story while ensuring all symptoms and details are uncovered to facilitate development of the differential diagnosis and management plan.

Internal Medicine rotations should:

1. Reinforce concepts previously introduced to medical students.
2. Provide opportunities for students to practice skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. Explain the central role of the patient in generating an accurate, contextual history.
2. List the components of the complete history, e.g., past medical history, family history, social history, review of systems.
3. Describe skilled interviewing techniques, e.g., active listening, empathetic responses, guided questioning, nonverbal communication.
4. Identify cognitive concepts used for a hypothesis-driven diagnostic process, e.g., pattern recognition, analytical reasoning, problem representation, illness scripts.

Skills

1. Use a logical sequence of questioning when obtaining the history.
2. Appropriately use either a comprehensive or focused approach to the history.
3. Involve the family and members of the healthcare team, if appropriate, in the interview.
4. Anticipate and interpret patient emotions and respond appropriately, e.g., with empathy.
5. Demonstrate clinical reasoning through targeted hypothesis-driven questioning.

Attitudes

1. Appreciate the importance of the medical history in the diagnostic process.
2. Value the medical history as a key component of the doctor-patient relationship.
3. Acknowledge uncertainty when the medical history may be difficult to perform or interpret.
4. Accept that taking a medical history is a skill that requires hard work, frequent practice, and feedback to develop.

REFERENCES

Entrustable Professional Activities for Entering Residency #1: Gather a History and Perform a Physical Exam. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency*. Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations

INFORMATION MASTERY

RATIONALE

Information Mastery and the practice of Evidence-Based Medicine (EBM) are key responsibilities for physicians. The best available evidence and the patient's values and preferences should inform decisions that physicians make about patient care. Information mastery requires the ability to identify knowledge gaps, formulate a clinical question and identify appropriate resources. It also requires the ability to determine the validity, importance, and applicability of clinical research findings.

Internal Medicine rotations should introduce concepts to medical students and provide opportunities for students to practice these skills. Internal Medicine rotations may also assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. Define evidence-based medicine.
2. Define the three fundamental principles of evidence-based medicine:
 - a. Optimal clinical decision-making requires awareness of the best available evidence.
 - b. The hierarchy of evidence provides guidance to differentiate clinical information that is more likely to be valid or true.
 - c. Evidence alone is not sufficient to make a clinical decision. The evidence should be integrated with clinical experience and patient values.
3. Describe the evidence cycle and how it provides the framework for integrating evidence directly into patient care, e.g., frame the clinical question, gather evidence, assess the evidence, make the clinical decision, evaluate, and adjust as needed.
4. Describe the following study designs: cohort, case-control, randomized-controlled trial, diagnostic test, systematic review, meta-analysis, clinical practice guideline.
5. Define the commonly occurring biases in different study designs, e.g., information bias, selection bias, confounding.
6. Define, calculate, and interpret key statistical measures, e.g., prevalence, sensitivity, specificity, positive predictive value, negative predictive value, likelihood ratio, relative risk, odds ratio, relative risk reduction, absolute risk reduction, number needed to treat, number needed to harm.
7. Interpret the statistical significance and precision of study results.

Skills

1. Translate an identified clinical knowledge gap or area of uncertainty into a focused clinical question structured in the Patient, Intervention, Control, Outcome (PICO) format.
2. Perform an effective literature search to find articles pertinent to a focused clinical question.
3. Apply the appropriate study design to each type of clinical question.
4. Construct a 2x2 table from study results.
5. Use an appropriate critical appraisal tool to determine a study's risk of bias, results, and applicability to patient care.
6. Summarize and present to colleagues and patients what was learned from consulting the medical literature.

Attitudes

1. Show commitment to evidence-based considerations in patient care.
2. Appreciate the importance of patient values and preferences when considering the applicability of evidence to individual patients.

REFERENCES

Entrustable Professional Activities for Entering Residency #7: Form Clinical Questions and Retrieve Evidence to Advance Patient Care. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency*. Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations

Guyatt G, Rennie D, Meade MO, Cook DJ, Eds. *Users' Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice*. 3rd Ed. New York, NY: McGraw-Hill; 2015.

Straus S, Glasziou P, Richardson W, and Haynes R. *Evidence-Based Medicine: How to Practice and Teach EBM*. 5th Ed. Edinburg: Elsevier Churchill Livingstone; 2018.

PALLIATIVE CARE

RATIONALE

Palliative care is an approach to providing patient-centered care to those with serious, often terminal illness. Hallmarks of palliative care include shared decision making, attention to patient goals, use of an interdisciplinary team, and providing comfort. Palliative care is not synonymous with hospice, which is a defined approach that has specific patient criteria. Palliative care is often done in conjunction with routine medical care.

Internal Medicine rotations should introduce the concepts to medical students and may provide opportunities for students to practice these skills.

LEARNING OBJECTIVES

Knowledge

1. Compare and contrast palliative care with routine care and hospice care.
2. Describe the components of the palliative approach to patient care.
3. Describe the additional services and disciplines involved in the palliative care team.
4. Understand the roles of the other members of the palliative care team.

Skills

1. Listen to an interdisciplinary team meeting.
2. Demonstrate patient-centered communication techniques, e.g., when giving bad news, when discussing advance care preferences.
3. Make rounds with the palliative care team.

Attitudes

1. Characterize the concept of palliative care and how it relates to patient care.
2. Show consideration for a palliative approach to patient care.
3. Acknowledge personal emotional reactions to patients' and families' grief.

REFERENCES

- Bush SH, Gratton V, Kabir M, Enright P, Grassau PA, Rice J, Hall P. Building a Medical Undergraduate Palliative Care Curriculum: Lessons Learned. *J Palliat Care*. 2021; 36(1):29-37.
- Boland JW, Barclay S, Gibbins J. Twelve Tips for Developing Palliative Care Teaching in an Undergraduate Curriculum for Medical Students. *Med Teach*. 2019; 41(12):1359-1365.
- Denney-Koelsch EM, Horowitz R, Quill T, Baldwin CD. An Integrated, Developmental Four-Year Medical School Curriculum in Palliative Care: A Longitudinal Content Evaluation Based on National Competency Standards. *J Palliat Med*. 2018; 21(9):1221-1233.
- Ellman MS, Fortin AH 6th, Putnam A, Bia M. Implementing and Evaluating a Four-Year Integrated End-of-Life Care Curriculum for Medical Students. *Teach Learn Med*. 2016; 28(2):229-39.
- Horowitz R, Gramling R, Quill T. Palliative Care Education in U.S. Medical Schools. *Med Educ*. 2014; 48(1):59-66.
- Magnani JW, Minor MA, Aldrich JM. Care at the End of Life: A Novel Curriculum Module Implemented by Medical Students. *Acad Med*. 2002; 77(4):292-8.
- Swetz KM, Kamal AH. Palliative Care. *Ann Intern Med*. 2018; 168(5): ITC33-ITC48.

PATIENT-CENTERED CARE

RATIONALE

Appreciating an individual's unique concerns, expectations, and values is an essential component to providing patient-centered care. A physician must collaborate with the patient and their families to make decisions that respect the patient's preferences, cultural beliefs, and socioeconomic background. The physician adapts communication and educational strategies to empower the patient to be an active member of the decision-making team. The clinical environment should foster improved access to care, embrace the patient's support system, and optimize the patient's emotional and physical well-being. Patient-centered care requires a holistic, individualized approach that keeps the patient at the center of the decision-making process.

Internal Medicine rotations should:

1. Introduce concepts to medical students.
2. Provide opportunities for students to practice these skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. Define patient centered care.
2. Name members of the healthcare team who can facilitate patient care.
3. Identify community resources that offer patient services, e.g., food, shelter, transportation, rehabilitation, literacy education, legal services.

Skills

1. Ask patients questions that address:
 - a. the patient's values, cultural beliefs, and socioeconomic background
 - b. the key members of the patient's support system
 - c. the patient's potential barriers to care
2. Collaborate with patients in a transparent and expedient manner.
3. Adapt communication strategies to the unique needs of the patient and clinical environment.
4. Communicate the patient's values and cultural beliefs with the healthcare team.
5. Summarize the patient's goals and expectations as they relate to the healthcare system.
6. Propose treatment strategies that prioritize a patient's physical and emotional well-being.
7. Use educational tools and community resources to help facilitate patient care.

Attitudes

1. Express an appropriate level of concern for the patient's physical and mental well-being.
2. Show interest and respect for the patient's values, cultural beliefs, and socioeconomic background.
3. Value the patient's goals and expectations of care.
4. Value the role of the patient and their families in the decision-making process.
5. Acknowledge that patients are at the center of the healthcare delivery system.
6. Cooperate with other members of the healthcare team to help facilitate care.

REFERENCES

- Nazarro RJ. Medical Humanities as tools for the teaching of patient-centered care. *J Hosp Med.* 2009; 4:512-14.
- NEJM Catalyst. What is Patient-Centered Care? January 1, 2017. <https://catalyst.nejm.org/doi/full/10.1056/CAT.17.0559>
- Rawson JV, Moretz J. Patient- and family-centered care: A primer. *J Am Coll Radiol.* 2016; 13:1544-49.

PATIENT NOTES

RATIONALE

Written communication, or the process of writing notes in the patient record, is a key responsibility of physicians. Through their written documentation, physicians document the patient's history and physical exam, outline the thought process supporting their medical decision making, and communicate with other physicians and healthcare professionals caring for the patient. Effective written communication is an essential skill for students to master during their internal medicine clerkship.

Internal Medicine rotations should:

1. Reinforce concepts previously introduced to medical students.
2. Provide opportunities for students to practice skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. Identify common purposes for written notes, e.g., communication, billing.
2. Identify the note types commonly used for documentation of clinical encounters, e.g., admission note, outpatient progress note.
3. Identify components of common types of notes, e.g., comprehensive note, problem-focused note.
4. Describe how the clinical reasoning process can assist in determining the relevance of clinical information in the note.
5. Describe how context impacts the content of a note, e.g., complete history and physical, problem focused outpatient visit.

Skills

1. Adapt written documentation to fit the clinical setting, e.g., comprehensive new patient evaluation, abbreviated follow up visit.
2. Include components of the patient presentation that are pertinent to the assessment and plan, e.g., history of present illness, past history, physical exam, laboratory values, imaging studies.
3. Include the following when a complete assessment and plan is necessary:
 - a. A complete prioritized problem list.
 - b. A summary statement/problem representation that includes key details from the patient's presentation.
 - c. A prioritized and supported differential diagnosis for each of the problems.
 - d. A comprehensive and detailed plan.
4. Use appropriate medical terminology, including qualifiers and categories when appropriate, e.g., acute, chronic, recurrent.
5. Complete written documentation using electronic health record best practices.

Attitudes

1. Show respect for patients, family members, and members of the healthcare team in written documentation.
2. Accept that excellent written communication requires preparation, practice, and adjustments based on feedback.
3. Acknowledge the importance of comprehensive and accurate written documentation to patient care.

REFERENCES

Baker EA, Ledford CH, Fogg L, Way DP, Park YS. The IDEA Assessment Tool: Assessing the Reporting, Diagnostic Reasoning, and Decision-Making Skills Demonstrated in Medical Students' Hospital Admission Notes. *Teach Learn Med.* 2015;27(2):163-73.

DeLeon S, Mothner B, Middleman A. Improving student documentation using a feedback tool. *Clin Teach.* 2018 Feb;15(1):48-51.

Entrustable Professional Activities for Entering Residency #5: Document a Clinical Encounter in the Patient Record. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency.* Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations

PERSONAL DEVELOPMENT AND WELLNESS

RATIONALE

A hallmark of any good physician is the ability to continually process, adapt to, and ultimately grow from clinical experiences. Until their clerkship year, most students have primarily experienced classroom learning and textbook cases. While on clinical services, they must learn to navigate complex team dynamics, emotionally charged patient encounters, and personal feelings of self-doubt under the pressure of a demanding schedule. Developing appropriate help-seeking behaviors, coping mechanisms, and systems for balancing personal and professional responsibilities will facilitate their success as students and ultimately as physicians.

Internal Medicine rotations should introduce concepts and provide opportunities to practice these skills. Internal medicine rotations may also assess concepts.

LEARNING OBJECTIVES

Knowledge

Seek help

1. Name individuals or resources to consult for stressful situations, learning environment issues, or psychiatric assistance.

Cope with stress

1. Define mindfulness and explain the impact it can have on emotional regulation.^{1,2}
2. Describe the four mature coping mechanisms and give examples of appropriate uses for each, e.g., suppression, altruism, humor, sublimation.
3. Identify personal behaviors to process difficult situations.
4. Anticipate which scenarios and patient cases will trigger a strong emotional response and prepare mentally as needed.
5. Identify fixed-mindset triggers, e.g., failure, encountering a highly competent peer, thinking about taking on a new challenge.³
6. Describe signs and symptoms of psychiatric pathology beyond the bounds of a normal stress response.

Create boundaries

1. Describe the balance of professional and personal obligations that accounts for the best interest of the patient, healthcare team, and oneself.

Skills

Seek help

1. Measure ability to manage stressful situations.

Cope with stress

1. Use coping strategies to independently manage stressful situations.
2. Use external assistance when unable to independently manage stressful situations.
3. Plan a time to process stressful situations if unable to do so in the moment.

Create boundaries

1. Communicate with the healthcare team regarding expectations for work performance and work hours.
2. Adapt healthcare team expectations when needed for the good of the team and the patients.
3. Plan a schedule that incorporates time for self-care.

REFERENCES

- 1 Mitmansgruber H, Beck TN, Höfer S, Schüßler G. When you don't like what you feel: Experiential avoidance, mindfulness and meta-emotion in emotion regulation. *Pers Individ Dif*. 2009;46(4):448-453.
- 2 Krasner MS, Epstein RM, Beckman H, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *JAMA*. 2009;302(12):1284-1293.
- 3 Dweck C. *Mindset: The New Psychology of Success*. Ballantine Books; 2016.
- 4 Stanford University's Carol Dweck on the Growth Mindset and Education | OneDublin.org. <https://onedublin.org/2012/06/19/stanford-universitys-carol-dweck-on-the-growth-mindset-and-education/>

Attitudes

Seek help

1. Accept that the responsibility for patient outcomes is shared collectively with the healthcare team.
2. Recognize that asking for assistance is a sign of maturity and good judgement.

Cope with stress

1. Navigate difficult situations
 - a. Acknowledge that it is normal to experience failure during a clinical rotation.
 - b. Accept that failures or mistakes are positive learning experiences.
 - c. Realize that abilities and intelligence are traits that can be improved through “effort, good teaching and persistence.”⁴
 - d. Reflect on feelings from a difficult situation without feeling abnormal guilt or anger.
 - e. Appreciate that challenging work environments are valuable opportunities to learn how to manage adversity.
2. Reflect on positive experiences
 - a. Realize that student involvement in patient care adds value.
 - b. Reflect on the humorous aspects of difficult situations when appropriate.

Create boundaries

1. Recognize that the uncertainty in practicing medicine may require flexible work-life boundaries.

PHYSICAL EXAMINATION

RATIONALE

The physical exam is a key component of the diagnostic evaluation and acts as a ritual that holds comfort and meaning for patient and provider. It is a tool for creating human connection and establishing an accurate patient narrative¹. The physical exam process should be clinically focused, efficient and hypothesis directed. It requires patient communication skills, knowledge of disease, technical skill performing the exam, and an understanding of physical exam characteristics and limitations.

Internal Medicine rotations should:

1. Reinforce concepts previously introduced to medical students.
2. Provide opportunities for students to practice these skills.
3. Assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. State the role of the physical exam in the doctor-patient relationship.
2. List the components of the complete physical exam.
3. Describe the value and limitations of the physical exam in the diagnostic process.
4. Correlate physical exam findings with imaging, laboratory data, and other studies.
5. Describe common physical exam findings that require urgent intervention, e.g., stridor, absent pulses.

Skills

1. Drape the patient to maintain patient comfort and modesty.
2. Use physical exam instruments properly, e.g., stethoscope, reflex hammer, otoscope.
3. Appropriately perform either a comprehensive or focused physical exam in an accurate and efficient manner.
4. Identify abnormal and normal physical exam findings.
5. Seek out an explanation for abnormal or unexpected physical exam findings using appropriate resources.
6. Describe and communicate physical exam maneuvers to the patient.

Attitudes

1. Show consideration for patient comfort and modesty during the physical exam.
2. Appreciate the importance of the physical exam in the diagnostic process.
3. Value the physical exam as a key component of the doctor-patient relationship.
4. Acknowledge uncertainty when the physical exam may be difficult to perform or interpret.
5. Accept that the physical exam is a skill that requires hard work, frequent practice, and feedback to develop.

REFERENCES

- 1 <https://stanfordmedicine25.stanford.edu/blog/archive/2020/physical-exam-remains-valuable.html>
- Entrustable Professional Activities for Entering Residency #1: Gather a History and Perform a Physical Exam. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency*. Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations
- Stanford Medicine 25. Promoting the Culture of Bedside Medicine. <https://stanfordmedicine25.stanford.edu/the25.html>

POINT OF CARE ULTRASOUND

RATIONALE

Point of care ultrasound (POCUS) plays an increasingly important role in the safe and effective performance of medical procedures and in diagnostic decision-making. Its use involves knowing the indications, contraindications, risks, benefits, test characteristics, and interpretation in order to provide evidence-based, patient-centered, and cost-effective patient care.

If opportunities exist, Internal Medicine rotations may introduce concepts to medical students.

LEARNING OBJECTIVES

Knowledge

1. Define the basic principles of ultrasound, e.g., echogenicity, Doppler, M-mode.
2. Describe characteristics of ultrasound instrumentation, e.g., gain, depth, transducer selection.
3. List indications for selected diagnostic POCUS examinations, e.g., cardiac, pulmonary, abdominal exam.
4. Identify risks, benefits, and test characteristics of selected diagnostic POCUS examinations, e.g., cardiac, pulmonary, abdominal exam.
5. Identify risks, benefits, and test characteristics for procedural POCUS examinations, e.g., thoracentesis, paracentesis, lumbar puncture.

Skills

1. Demonstrate image acquisition for selected diagnostic and procedural POCUS examinations.
2. Interpret selected diagnostic and procedural POCUS examinations.

Attitudes

1. Express appreciation for the role of POCUS in medical procedures and diagnostic decision-making.

REFERENCES

- Arnold MJ, Jonas CE, Carter RE. Point-of-Care Ultrasonography. *Am Fam Physician*. 2020;101(5):275-285.
- Lambrecht JE, Zhang K, Tierney DM, Millner P, Giovannini D, Barron K, Novak W, Patel SA, Dversdal R, Cox EJ, LoPresti CM. Integration of Point of Care Ultrasound Education into the Internal Medicine Core Clerkship Experience. *J Ultrasound Med*. 2021; 9999:1-8.
- Mayo PH, Copetti R, Feller-Kopman D, Mathis G, Maury E, Mongodi S, Mojoli F, Volpicelli G, Zanobetti M. Thoracic ultrasonography: a narrative review. *Intensive Care Med*. 2019; 45(9):1200-1211.

PROFESSIONALISM

RATIONALE

According to the ABIM Foundation Physician Charter, “medical professionalism is the daily expression of the desire to help people and society as a whole by providing quality healthcare to those in need.” The definition of medical professionalism continues to evolve, and our students will contribute to the evolution of our profession and standards of professionalism. Fundamental knowledge, skills and attitudes are necessary so that students can adhere to a set of medical ethics and develop a commitment to social justice. This will prepare students to play an active role in the accountability of our profession to society.

Internal Medicine rotations should:

1. Introduce concepts to medical students.
2. Provide opportunities for students to practice these skills.
3. Assess concepts during the rotation.

Many of the objectives below are derived from the Physician Competency Reference Set adapted by the AAMC and documented in the publication: Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Acad Med.* 2013; 88:1088-1094.

LEARNING OBJECTIVES

Knowledge

1. Define the following bioethical principles of the medical profession: autonomy, beneficence, nonmaleficence, truth-telling, and confidentiality.
2. Define social justice.
3. List individual and institutional level barriers to professional behavior.

Skills

1. Demonstrate compassion, integrity, and respect for others.
2. Identify and advocate for patients’ needs and preferences in a manner appropriate to the student role.
3. Prioritize follow-up on all clinical information and timely communication of that information to patients and appropriate team members.
4. Respect patients’ autonomy and informed choices, including the right to refuse preventive, diagnostic, and therapeutic interventions.
5. Demonstrate respect for patients’ privacy when dealing with protected health information and follow Health Information Portability and Accountability Act (HIPAA) standards.
6. Demonstrate a commitment to promoting changes within the healthcare system to facilitate greater health equity for all populations.
7. Identify potential triggers for professionalism lapses and take responsibility for one’s own professionalism lapses.

Attitudes

1. Commit to following the bioethical principles of the medical profession: autonomy, beneficence, nonmaleficence, truth-telling, and confidentiality.
2. Commit to carrying out professional responsibilities.

REFERENCES

- Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Acad Med.* 2013; 88:1088-1094.
- Birden H, Glass N, Wilson I, Harrison M, Usherwood T, Nass D. Defining professionalism in medical education: A systematic review. *Med Teach.* 2014; 36:47-61.

SELF-DIRECTED LEARNING

RATIONALE

Self-directed learning is the process where students identify gaps in their knowledge or skills, develop learning objectives, find resources, practice deliberately, obtain feedback, modify patterns, and assess learning strategies. As current medical knowledge and skills continue to rapidly evolve, it is imperative that students develop lifelong skills in reflecting on their current level of comprehension and experiences, having an awareness of gaps in understanding, and implementing a plan for personal growth. Educators should act as facilitators and foster the self-directed learning process.

Internal Medicine rotations should:

1. Introduce concepts to medical students.
2. Provide educators who foster and facilitate self-directed learning.
3. Provide opportunities for students to practice these skills.
4. Provide feedback to students on their learning plans and performance.

LEARNING OBJECTIVES

Knowledge

1. Identify resources that work best for individual learning style.
2. List the components of an appropriate SMART learning objective (Specific, Measurable, Achievable, Relevant, and Time-based).

Skills

1. Identify learning needs by determining the difference between present and required level of competency.
2. Develop SMART learning objectives to address learning needs.
3. Develop a learning contract that specifies learning objectives, required resources, and strategies for implementation and achievement of these objectives.
4. Use resources that match learning style and learning objectives.
5. Use a learning portfolio to track acquisition of knowledge, skills, and attitudes.
6. Regularly seek feedback from multiple sources, review recommendations, and integrate with existing knowledge and skills.

Attitudes

1. Show commitment to reflecting on gaps in knowledge and skills.
2. Value the role of requesting help and seeking feedback from others.
3. Demonstrate openness to feedback from colleagues and other healthcare professionals.

REFERENCES

American Association of Medical Colleges. Medical Student Portfolios. <https://www.aamc.org/system/files/c/2/490258-medicalstudentportfolios.pdf>

Ginzburg, S. Use of Self-Directed Learning in U.S. and Canadian Medical Schools. AAMC Curriculum Inventory in Context. 2018; 5(5). <https://www.aamc.org/media/20801/download>

Murad MH, Varkey P. Self-directed learning in health professions education. *Ann Acad Med Singapore*. 2008; 37:580-90.

SYSTEMS-BASED PRACTICE

RATIONALE

As healthcare evolves, the systems used to deliver it have become more complex but do not necessarily provide more value. For example, the United States healthcare system provides low value compared to other industrialized countries, due in part to two factors: medical error and increasing cost without improved outcomes. Through quality improvement, providers can seek to improve the value of care provided by lowering both errors and unnecessary cost. This is an important part of medical training, and the Association of American Medical Colleges recommends graduating medical students be entrusted to identify these failures and contribute to a culture of safety and improvement.

Internal Medicine rotations should introduce concepts to medical students and may provide opportunities for students to practice these skills.

LEARNING OBJECTIVES

Knowledge

1. Describe the plan-do-study-act cycle in quality improvement.
2. Describe the different types of medical errors, e.g., adverse drug event, documentation errors, healthcare associated infections.
3. List the factors involved in medical error.
4. Define value in health care, e.g., as defined by the Institute of Medicine, the American College of Physicians, or the value equation.
5. For a given condition, identify interventions that provide no benefit and may be harmful.

Skills

1. Perform a root cause analysis on a medical error to determine factors that led to it.
2. Design and assess a method to reduce medical error and/or improve quality of patient care.

Attitudes

1. Express appreciation for ongoing quality improvement in health care.
2. Appreciate that a systems approach can minimize errors in health care.
3. Adopt a non-judgmental perspective or just culture to individual and healthcare team member errors and shortcomings.
4. Acknowledge that medical error prevention and patient safety are the responsibility of all healthcare professionals and systems.
5. Acknowledge that biases may contribute to medical error.
6. Incorporate concepts of value into patient management to optimize the care plan for each individual patient.

REFERENCES

Skochelak SE, ed. *Health Systems Science*. 2nd Edition. 2020. Amsterdam: Elsevier.

Entrustable Professional Activities for Entering Residency #13: Identify System Failures and Contribute to a Culture of Safety and Improvement. From: Obeso V, Brown D, Aiyer M, Barron B, Bull J, Carter T, Emery M, Gillespie C, Hormann M, Hyderi A, Lupi C, Schwartz M, Uthman M, Vasilevskis EE, Yingling S, Phillipi C, eds.; for Core EPAs for Entering Residency Pilot Program. *Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency*. Washington, DC: Association of American Medical Colleges; 2017. www.aamc.org/initiatives/coreepas/publicationsandpresentations

Dell Healthcare Value Modules: <https://vbhc.dellmed.utexas.edu/>

THERAPEUTIC DECISION-MAKING

RATIONALE

Therapeutic decision-making is a key component of patient care. It requires the ability to consider multiple factors including diagnostic decision-making, evidence-based medicine, treatment risk/benefits/effectiveness, patient rights/preferences/values, and resource considerations (e.g., cost, availability) to devise an acceptable plan. It requires communicating all of the factors considered when constructing a plan and utilizing a patient-centered shared decision-making approach.

Internal Medicine rotations should introduce concepts to medical students and provide opportunities for students to practice these skills. Internal Medicine rotations may also assess concepts during the rotation.

LEARNING OBJECTIVES

Knowledge

1. State how algorithms, clinical decision support, clinical guidelines and pathways may be used in the therapeutic decision process.
2. Identify risks/benefits/effectiveness and resource considerations (e.g., cost, availability) when developing a treatment plan.
3. Describe the expected course and response to a specific treatment plan.
4. State the role that systems-based factors play in the therapeutic decision process.

Skills

1. Balance treatment risk/benefit/effectiveness, patient rights/preferences/values, and resource considerations when developing a treatment plan.
2. Involve the patient, family, and healthcare team in the therapeutic decision-making process, e.g., elicit preferences/values, communicate risks/benefits/effectiveness.
3. Explain treatment plans to the patient, family, and healthcare team using patient-centered outcomes.
4. Establish means of monitoring and following-up on the results of a treatment plan with the patient, family, and healthcare team.

Attitudes

1. Acknowledge the uncertainty of therapeutic decision-making and that there are often multiple acceptable and reasonable therapeutic options.
2. Acknowledge the need to be flexible with an openness to changing an approach based on the treatment response.
3. Acknowledge the risk inherent in the treatment plan and the effect this may have on the patient, family, and healthcare professionals.

REFERENCES

- Cook DA, Sherbino J, Durning SJ. Management Reasoning: Beyond the Diagnosis. *JAMA*. 2018;319(22):2267-2268.
- Parsons AS, Wijesekera TP, Rencic JJ. The Management Script: A Practical Tool for Teaching Management Reasoning. *Acad Med*. 2020;95(8):1179-1185.