

Infectious Disease Curriculum

Goal

Infectious disease medicine requires an understanding of the microbiology, prevention, and management of disorders caused by viral, bacterial, fungal, and parasitic infections, including the appropriate use of antimicrobial agents, vaccines, and other immunobiologic agents. Important elements include the environmental, occupational, and host factors that predispose to infection, as well as basic principles of the epidemiology and transmission of infection.

The general internist should be able to provide appropriate preventive (including optimal use of immunization and chemoprophylaxis), diagnostic, and therapeutic care for most infections. He or she should also be able to evaluate symptoms that may be caused by a wide range of infectious disorders.

Rotation on the medical ward services and in general medicine and HIV clinic will provide training for the resident to (1) understand and elicit pertinent historical details relevant to the epidemiology and transmission of infectious disease, (2) recognize and treat a broad spectrum of infectious disease problems common in the inpatient and outpatient setting, (3) develop critical thinking skills to aid in the differentiation of non-infectious disorders masquerading as infectious diseases, (4) understand diagnostic and management approaches to patients with early HIV infection and acquired immunodeficiency syndrome (AIDS), and (5) identify appropriate candidates for immunization for the prevention of illness in travelers, the elderly, immunosuppressed patients and other at-risk populations.

Objectives

Patient Care

- I. Provide patient care that is compassionate, appropriate and effective for the prevention and treatment of infectious diseases.

Medical Knowledge

- I. Develop the knowledge and skills to obtain an appropriate history for risk factors for infectious diseases including travel history, sexual history, exposures (environmental, occupational and animal), recreational drug use, pets, comorbidities and medication use (antibiotics, antipyretics, herbs and other medications).
- II. Develop the knowledge and skills for performing and interpreting physical exam findings on patients with suspected infectious disease, including vital signs, skin inspection, the funduscopic exam, and the assessment of line sites.
- III. Develop an approach to patients presenting the following symptoms or signs:
 - a. cough
 - b. diarrhea
 - c. dyspnea

- d. dysuria
 - e. fever (community-acquired, nosocomial, fever of unknown origin (FUO), and neutropenic fever) and systemic complaints in the setting of fever e.g. headache, abdominal pain, back pain, etc.
 - f. hemoptysis
 - g. joint pain/swelling
 - h. rash
 - i. wheezing
 - j. history of (+) PPD or tuberculosis exposure
 - k. hematologic abnormalities (elevated or low white blood cell or platelet count)
 - l. vital sign abnormalities (pulse-temperature disassociation, O₂ saturation, hypotension)
- IV. Recognize symptoms and signs, differential diagnosis and management of the following disease processes:
- a. Upper and lower respiratory infections
 - b. Urinary tract infections
 - c. Skin and soft tissue infections including wound infections
 - d. Osteomyelitis
 - e. Septic arthritis
 - f. Endocarditis, catheter sepsis, and other intravascular infections
 - g. CNS infections - meningitis, encephalitis, and epidural and brain abscess
 - h. Intra-abdominal and gastrointestinal infections including food poisoning, hepatitis, colitis, peritonitis and diverticulitis
 - i. Nosocomial infections including pneumonia, UTIs, wound infections, and bacteremia
 - j. Toxin-mediated illness
 - k. Sepsis syndrome and septic shock
 - k. Sexually transmitted diseases including urethritis, genital ulcers, cervicitis, pelvic inflammatory disease, and syphilis
 - l. Tick-borne diseases
 - m. Tuberculosis
 - n. Opportunistic infections in immunosuppressed patients
 - o. Eye infections
- V. Develop an approach to patients with suspected acute HIV, AIDS and Immune Reconstitution Syndrome including appropriate prevention of and management of opportunistic infection; evaluation and treatment of other disease-related complications; and management of antiretroviral therapy and complications of therapy.
- VI. Understand indications for immunizations and antibiotic prophylaxis in disease prevention.
- VII. Develop knowledge of classes of antimicrobial agents, risks and benefits of specific antimicrobials, mechanisms of antimicrobial resistance and appropriate use of therapy

empirically and based on interpretation of available culture and susceptibility results.

- VIII. Understand appropriate use and interpretation of diagnostic studies, including:
- a. Complete blood count
 - b. Liver function tests
 - c. Hepatitis serologies
 - d. Fluorescent treponemal antibodies, RPR and VDRL
 - e. Acute and convalescent antibody titers
 - f. PPD
 - g. CD4 lymphocyte count
 - h. HIV RNA viral load
 - i. Antibiotic drug levels
 - j. Sputum analysis, including gram stain; acid-fast, silver and fungal stains, and culture results.
 - k. Urine analysis and culture
 - l. Culture results in symptomatic and asymptomatic patients
 - m. Lumbar puncture
 - n. Thoracentesis and pleural fluid analysis
 - o. Bronchoscopy with bronchoalveolar lavage and/or biopsy
 - p. Punch biopsy
 - q. Other tissue biopsies
 - r. Chest radiograph and CT
 - s. Tagged WBC scan
 - t. Gallium scan

Practice-Based Learning and Improvement

- I. Utilize multidisciplinary approach to manage patients with complex psychosocial needs, involving social workers, case workers, public health, nurses, pharmacists, and dietitians.
- II. Be able to access clinical practice guidelines to help improve patient care.
 - a. Infectious Diseases Society of America - www.idsociety.org
 - b. CDC Prevention Guidelines - www.cdc.gov
 - c. American Thoracic Society - www.thoracic.org
 - d. AIDS - www.aidsinfo.nih.gov, <http://hivinsite.ucsf.edu>
 - e. American College of Physicians - <http://www.acponline.org/sci-policy/guidelines/?hp>
 - f. American Heart Association (endocarditis prophylaxis) - www.americanheart.org
- III. Research specific clinical questions arising from patient care for best evidence-based practice.
- IV. Review patient care errors with attention to changes in systems to prevent recurrence.
- V. Utilize information technology to enhance patient education.

Interpersonal and Communication Skills

- I. Communicate effectively with patients and families in a compassionate, culturally sensitive and patient-centered manner to improve understanding and compliance.
- II. Communicate with personnel in the Microbiology Laboratory to obtain timely results to facilitate patient care.
- III. Ensure charting is legible, thoughtful, complete and timely to facilitate communication within the health care team.

Professionalism

- I. Understand how to function effectively as a patient advocate while balancing the needs of the community with respect to issues of antimicrobial therapy and vaccination.
- II. Understand impact of gender, age, culture, religion, and socioeconomic status on compliance, transmission and treatment of infectious diseases.
- III. Develop a respectful, compassionate approach to counseling patients on end-of-life issues as they pertain to the treatment of opportunistic and hospital-acquired infection.
- IV. Understand how to inform patients regarding the natural history of their disease and the risks and benefits of therapeutic interventions to obtain informed consent for procedures and treatments.
- V. Provide meaningful feedback to colleagues and students regarding performance and behavior.

Systems-Based Practice

- I. Interact with the multidisciplinary team including the social worker, nurse and home nursing agency, pharmacist, dietician, and billing coordinator to provide optimal care, particularly in the transition to continued treatment at home.
- II. Apply evidence-based, cost-conscious strategies to prevention, diagnosis and disease management.
- III. Understand hospital infection control practices.
- IV. Understand modes of disease transmission and public health measures required to contain spread of disease.
- V. Develop skills in identifying opportunities for quality improvement, risk management and cost-effectiveness within a practice.

Teaching Methods

- I. Attending supervision of resident activities in patient care
- II. Teaching rounds
- III. Interaction with microbiology and pathology to review results
- IV. Conferences
 - Morning report

- Noon conference
- V. Recommended reading

Resident Evaluation

- I. Attending feedback to residents on strengths and weaknesses throughout the rotation
- II. Attending written evaluation of residents at the end of the rotation
- III. Mini-CEX bedside evaluation tool

Resources

Harrison's Principles of Internal Medicine, 15th ed. McGraw Hill, 2001.

Cecil Textbook of Medicine, 21st ed, Saunders, 2000.

Mandell's Principles and Practice of Infectious Diseases, 5th ed. Churchill Livingstone Inc., 2000.

Manual of Clinical Problems in Infectious Disease, 4th ed. Lippincott, Williams & Wilkins, 1999.

MKSAP

The Sanford Guide to Antimicrobial Therapy

The Sanford Guide to HIV/AIDS Therapy

On-line Resources

- UptoDate
- MDConsult
- www.aidsmeds.com
- Practice Guidelines
 - Infectious Diseases Society of America - www.idsociety.org
 - CDC Prevention Guidelines - www.cdc.gov
 - American Thoracic Society - www.thoracic.org
 - AIDS - www.aidsinfo.nih.gov, <http://hivinsite.ucsf.edu>
 - American College of Physicians - <http://www.acponline.org/sci-policy/guidelines/?hp>
 - American Heart Association (Endocarditis prophylaxis) - www.americanheart.org

Card with current antimicrobial susceptibility profiles available at SBCH Microbiology Lab.

Residents should review Annals of Internal Medicine for recent Updates in Infectious Disease section as well as ACP journal club for pertinent articles.