

Infectious Disease Rotation Educational Goals & Objectives

Infectious diseases are seen commonly in the practice of primary care. The Infectious Disease rotation will provide the resident with an opportunity to manage a number of common infectious diseases. The goal of the rotation is to give the resident an understanding of the broad systemic manifestations of infectious diseases and an opportunity to explore the microbiology, prevention, and management of diseases caused by a wide variety of viral, bacterial, fungal and parasitic pathogens as well as HIV. Focus will be on the following issues: identification of those factors that predispose to infection, epidemiology and transmission, clinical manifestations of disease, cost-effective diagnostic evaluation, and focused treatment, with attention to such issues as resistance and antibiotic stewardship.

Faculty will facilitate learning in the 6 core competencies as follows:

Patient Care and Procedural Skills

- I. All residents must be able to provide compassionate, culturally-sensitive, and appropriate care for patients to prevent and treat infectious diseases.
 - PGY2s should seek directed and appropriate specialty or surgical consultation when necessary to further patient care.
 - PGY3s should supervise and ensure seamless transitions of care between primary and consulting teams and between inpatient and outpatient care.

- II. Residents will demonstrate the ability to take a pertinent history and perform a focused physical exam. PGY1s should be able to differentiate between stable and unstable patients and elicit the following historical details:
 - risk factors that predispose patients to particular infections, including recent contacts, pets, travel and family history, sexual history, occupational and environmental exposures, recent surgery/dental procedures or hospitalization, and drug and alcohol use
 - vaccination history
 - history of symptoms, such as fever curve
 - timing of symptoms, exposures, and recent antibiotics

PGY2s should be able to recognize the contribution of comorbidities and medications to a patient's immune status and risk for infection.

PGY3s should be able to independently obtain the above details for patients with a complex history of infection and multiple comorbid conditions.

- III. Residents should be able to characterize the following physical findings:
 - PGY1s: heart murmur, jaundice, joint effusions, lymphadenopathy, maculopapular and vesicular rashes, meningeal signs, organomegaly, peripheral stigmata of endocarditis
 - PGY2s: more subtle signs of infected catheters or medical devices
 - PGY3s: changing heart murmur, other rashes

- IV. Residents will understand the indications, contraindications, complications, limitations, and interpretation of following procedures, and become competent in the their safe and effective use:
- PGY1s: incision and drainage of superficial abscesses, lumbar puncture, proper collection of culture specimens from blood, cervix, throat, rectum, urethra, and vagina; thoracentesis, and skin biopsy
 - PGY2s: saline and potassium hydroxide preparation of vaginal fluid
 - PGY3s: skin scrapings; Tuberculin and anergy panel skin tests.

Medical Knowledge

- I. PGY1s will develop an understanding of the basic pathophysiology and approach to evaluation and treatment of the following presenting conditions commonly associated with infectious diseases:
- Animal bite
 - Back pain in the setting of other symptoms or signs of infection
 - Cough
 - COVID-19
 - Diarrhea
 - Dyspnea
 - Dysuria
 - Fever, fever of unknown origin (FUO), neutropenic fever, and pulse-temperature dissociation
 - Food poisoning
 - Hemoptysis
 - History of positive PPD or Tuberculosis exposure
 - Joint pain/swelling
 - Rash
 - SIRS physiology
 - Ulcer

PGY2s will also develop an understanding of the pathophysiology, clinical presentation, targeted therapy, and duration of therapy for the following infections:

- Cellulitis
- Cystitis and pyelonephritis
- Eye infections
- Infected pressure ulcers
- Intra-abdominal and gastrointestinal infections, including cholecystitis, cholangitis, diverticulitis, and hepatitis
- Osteomyelitis
- Nosocomial infections, including bacteremia, line infections, and infections involving the lungs, urinary tract, and wounds
- Skin and soft tissue infections
- Sexually transmitted diseases

- Systemic mycoses and viral infections
- Tuberculosis
- Upper and lower respiratory tract infections

PGY3s will develop an understanding of the pathophysiology, clinical presentation, and targeted therapy for the above conditions, with attention to epidemiology, mode of transmission (e.g. respiratory, tick-borne, etc.), and isolation precautions. PGY3s will recognize lack of response to therapy and identify possible causes and an alternate treatment plan.

II. All residents will become familiar the following issues related to HIV:

- a. HIV risk factors
- b. Evaluation at initial diagnosis
- c. AIDS-defining conditions
- d. Prevention of and treatment for opportunistic infections
- e. Initial treatment of AIDS
- f. Treatment related complications

III. Residents will become comfortable with conditions requiring urgent identification and treatment, including:

- Adverse reactions to antibiotics
- COVID-19
- Endocarditis
- Epidural and brain abscess
- Meningitis/Encephalitis
- Necrotizing fasciitis
- Opportunistic infections in immunosuppressed hosts
- Perforation and peritonitis
- Periorbital cellulitis
- Sepsis, severe sepsis and septic shock
- Septic joint
- Toxin-mediated illness

IV. PGY1s will be able to understand the indications for ordering and the interpretation of the following laboratory values and procedures:

- Antibiotic sensitivity testing and drug levels
- Antibody and PCR testing for microorganisms
- Analysis of body fluids: Cell counts and differential, chemistries, Gram stain and cultures of body fluids
- CRP and sedimentation rate
- DIC panel
- FTA, RPR, and VDRL
- Hepatitis serologies
- HIV, HIV RNA viral load, and CD4 lymphocyte counts
- Imaging with radiographs, CT, MRI and ultrasound

- Lactic acid and anion gap
- Platelet count
- PPD
- Serum chemistries
- Sputum analysis
- Stool ova and parasite results
- Tagged white cell and gallium scans
- Tissue biopsy
- White cell count and differential

PGY2s will also demonstrate knowledge of the indications for ordering and/or the interpretation of:

- Bronchoscopy
- Hepatitis serologies in the setting of recent infection or vaccination
- Malaria smears

PGY3s will independently, appropriately order studies and be able to interpret results within the context of patient comorbidities, pretest probability of disease, and patient values.

- V. Residents should become fluent in the social issues relevant to infectious disease and be able to counsel patients appropriately on HIV risk assessment and post-diagnosis counseling, risk of transmission of infectious diseases to close contacts, and substance abuse. Residents should become familiar with diagnoses requiring Public Health notification.
- VI. All residents will be fully trained in treatment and infection control protocols and procedures (e.g. personal protective equipment [PPE]) and trained clinically to properly recognize and care for COVID-19 patients.

Practice-Based Learning and Improvement

- I. All residents should be able to access current national guidelines (e.g. Infectious Diseases Society of America https://www.idsociety.org/practice-guideline/practice-guidelines/#/+0/date_na_dt/desc/) to apply evidence-based strategies to patient care.
- II. PGY2s should develop skills in evaluating new studies in published literature, through Journal Club and independent study.
- III. All residents should participate in case-based therapeutic decision-making, involving the primary care provider, infectious disease specialist and, where appropriate, surgeon.
- IV. Residents should learn to coordinate patient care as part of a larger team, including the nurse, pharmacist, dietician, and social worker to optimize patient care, with PGY3s taking a leadership role.
- V. All residents should respond with positive changes to feedback from members of the health care team.

Interpersonal and Communication Skills

- I. PGY1s must demonstrate organized and articulate written (electronic) and verbal communication skills that build rapport with patients and families, convey information to other health care professionals, and provide timely documentation in the chart.
- II. PGY1s must communicate with the microbiology staff, lab staff, and pathologist to obtain results in a timely fashion and to facilitate their interpretation.
- III. PGY2s must also develop interpersonal skills that facilitate collaboration with patients, their families, and other health professionals.
- IV. PGY3s should demonstrate leadership skills to build consensus and coordinate a multidisciplinary approach to patient care.
- V. PGY3s must be able to elicit information or agreement in situations with complex social dynamics, for example, identifying the power of attorney or surrogate decision maker, and resolving conflict among family members with disparate wishes.

Professionalism

- I. All residents must demonstrate strong commitment to carrying out professional responsibilities as reflected in their conduct, ethical behavior, attire, interactions with colleagues and community, and devotion to patient care.
- II. PGY1s should be able to educate patients and their families in a manner respectful of gender, age, culture, race, religion, disabilities, national origin, socioeconomic status, and sexual orientation on choices regarding their care.
- III. PGY2s should be able to use time efficiently in the clinic to see patients and chart information.
- IV. PGY2s should be able to counsel patients and families both on diagnostic and treatment decisions and on withdrawal of care.
- V. PGY3s should be able to provide constructive criticism and feedback to more junior members of the team.

Systems-Based Practice

- I. PGY1s must have a basic understanding that their diagnostic and treatment decisions involve cost and risk and affect quality of care.
- II. PGY2s must be able to identify current quality issues in infectious disease, such as antibiotic resistance, antibiotic stewardship, and compliance with hand washing.
- III. PGY3s must also demonstrate an awareness of alternative therapies and their costs, risks, and benefits, including selection of antibiotics, and in-home versus in-hospital treatment.

Teaching Methods

- I. Supervised patient care in the inpatient and outpatient setting.
 - Residents will initially be directly observed with patients to facilitate the acquisition of excellent history taking and physical exam skills.

- As residents become more proficient, they will interact independently with patients and present cases to faculty.
 - Initial emphasis will be on diagnosis and basic management.
 - When residents have mastered these skills, focus will be on medical decision-making, and residents will work with supervising physicians to finalize a care plan.
- II. Conferences
- Specialty-specific didactics
- III. Independent study
- Journal and Textbook reading TBD by infectious diseases attending
 - Cohen J, Powderly WG, Opal SM. *Cohen & Powderly: Infectious Diseases*, 4th ed. Elsevier; 2017.
 - *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*, 8th ed. Elsevier; 2014.
 - Manuals and guides
 - Gilbert DN, Moellering RC, Sande MA. *The Sanford Guide to Antimicrobial Therapy*. Antimicrobial Therapy, current year.
 - CMH hospital antibiogram
 - Online educational resources
 - American Heart Association www.americanheart.org (Statements, Guidelines, and Clinical Updates – endocarditis, device infections)
 - Centers for Disease Control and Prevention www.CDC.gov
 - COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html>
 - HIV/AIDS – www.aidsinfo.nih.gov, <http://hivinsite.ucsf.edu>, aidsmap.com
 - ISDA www.idsociety.org
 - World Health Organization: How to put on and remove personal protective equipment (PPE) <https://openwho.org/courses/IPC-PPE-EN>
 - Up to Date
 - Clinical Key

Evaluation

- I. Mini-CEX bedside evaluation tool
- II. Verbal mid-rotation individual feedback
- III. 360 Evaluation
- IV. Attending written evaluation of resident at the end of the month based on rotation observations and chart review.

Rotation Structure

- I. Residents should contact the infectious diseases attending the day prior to determine start time and location.

- II. Residents should divide their time between the hospital, including a visit to the microbiology lab, and the clinic as appropriate to achieve the above educational goals.
- Rotations are a “hands-on” learning experience. If you have a resident, send them in to see a patient.
 - If the same patient returns during the rotation, send the resident in to see the follow-up.
 - Case-based learning is very effective. Give your resident patient-based questions to research and report back to you.
 - Consider having your resident do a short presentation to the group on a pertinent topic.
 - When doing consults, ensure the resident understands the question asked and provides a concise answer.
- III. Call and weekend responsibilities TBD by the attending physician.
- Hours worked must be consistent with ACGME requirements and are subject to approval by the Program Director.
- IV. Residents have specialty-specific didactics and should be excused in a timely fashion to attend.