

Curriculum For Resident Training in Clinical Infectious Diseases

Division of Infectious Diseases

University of California, Davis School of Medicine

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Program Director Reviewer: Craig Keenan, MD

Resident Reviewer:

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I. Statement of Philosophy

Management of Infectious Diseases is an increasingly complex subspecialty of Internal Medicine. The Division of Infectious Diseases is committed to training residents in the aspects of clinical infectious diseases to acquire competency of a general internist. This includes inpatient and outpatient rotations that provide a broad range of pathology in adult and geriatric patients. The faculty is responsible for teaching and evaluating the residents by providing supervision of patient care. The residents demonstrate their competence by presentations to the supervising faculty justifying their plans with the clinical evidence and literature-based strategies for diagnosis and management. They are responsible for attending teaching conferences. The overall goal of training is to develop competent, independent thinking physicians.

II. List of Faculty

Richard B. Pollard, M.D. Division Chief

Stuart H. Cohen, M.D. Fellowship Program Director, Clinical Director Infection Control and Hospital Epidemiology

Neil M. Flynn, M.D., M.P.H.

Jay V. Solnick, M.D., Ph.D.

Paolo Troia-Cancio, M.D. Clinical Director CARES

Javeed Siddiqui, M.D.

David Asmuth, M.D.

Hien Nguyen, M.D.

Gregory Melcher, M.D.

Raymond Byun, M.D.

Donna DeFreitas, M.D.

Archana Maniar, M.D.

III. Educational Purpose

Infectious Diseases remain a major cause of morbidity and mortality. In addition, new organisms have been emerging, older pathogens have been re-emerging and the specter of bioterrorism requires a broad range of knowledge for physicians practicing clinical infectious diseases. The purpose of this is to broadly train our residents to treat and manage patients with

infectious diseases in a changing world. The residents serve as consultants in the hospital as well as in the outpatient setting. Demonstration of competency will be evaluated by using the following competencies.

IV. Teaching Methods

1. Direct Supervised Patient Care: The primary method of teaching is at the patient's bedside. The resident evaluates the patient independently and presents to the faculty member, who supervises the clinical practice.
2. Didactics: A journal club and case conference provide didactic teaching. Self-directed learning by reading textbooks and current literature is an expectation.

V. Educational Content

1. Mix of diseases/patient characteristics/patient encounters: all inpatients are seen on a consultative basis from all services at the UC Davis Medical Center. Outpatient visits in the Infectious Diseases Clinic at UC Davis also occur. Such patients have a wide mix of acute and chronic infectious diseases, both community and hospital-acquired. It includes immunosuppressed patients after transplantations, as well as patients with HIV disease. UC Davis sees patients from a vast range of socioeconomic and cultural backgrounds, including large numbers of immigrants. Thus, both common and uncommon conditions may be seen on the consult service.
2. Clinical Venue: All patients are seen in the UC Davis Medical Center in the hospital or in the Infectious Diseases Clinic at the Ambulatory Care Center.

VI. Educational Goals and Objectives

1. General Goals: The overall goals of the ID Rotation include the following:
 - a. Learn how to obtain relevant information for the solution of problems presented by infectious diseases
 - b. Learn to do a directed history and physical examination
 - c. Learn to collect relevant laboratory data
 - d. Evaluate results of microbiological cultures and susceptibility testing
 - e. Assess the risks and benefits of relevant diagnostic procedures
 - f. Understand the rationale for selection and use of antibiotics on the UCDCMC hospital formulary
 - g. Select antibiotics and usual dosing regimens from the hospital formulary
 - h. Learn how to interpret the antibiogram in the selection of an antibiotic
 - i. Understand the role of the consultant, the importance of communication clarity of recommendations
 - j. Master the physical diagnostic skills necessary to be an effective internal medicine physician.
 - k. The resident must be able to evaluate a patient with an infectious disease and determine the diagnosis and a plan for management.
 - l. The resident must have physical access and be able to effectively use the Clinical Microbiology Laboratory, other pathology laboratories and radiology and understand the results provided.

- m. The resident must understand the correct use of antimicrobial drugs and the utility of antimicrobial formularies. The resident will interact with the pharmacy and other healthcare providers in order to optimally utilize these important drugs as part of the Antimicrobial Stewardship Program.
 - n. The resident must be able to critically interpret the medical literature and research data.
2. Rotation Specific Competencies: Residents will take the ID rotation in any of their PGY years. Thus, these Rotation-Specific competencies should be demonstrated by the end of the rotation for all residents.

Patient Care

- a. Residents must be able to obtain an accurate history focusing on the issues of particular interest to infectious diseases and perform a complete and accurate physical exam. The resident must also demonstrate the ability to accurately review medical records.
- b. Residents must be able to synthesize patient data and the literature to come to an accurate differential diagnosis, demonstrate sound clinical judgment, appropriately use antimicrobial agents, and incorporation of the patient preferences into the final plan.

Medical Knowledge

- c. The resident must demonstrate knowledge of the literature in Infectious Diseases related to patients followed.
- d. Residents should have an understanding of the basic pharmacology and antimicrobial spectrum for the common antibiotic classes and commonly used antibiotics (including vancomycin, linezolid, cephalosporins, penicillins, fluorquinolones, aminoglycosides, antifungal agents, sulfonamides, tetracyclines, and macrolides).
- e. The appropriate use of antimicrobial agents is an important skill that must be understood.

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| References | 1. Mandell, et al. Principles and practices of Infectious Diseases, 6 th Ed. 2. Guidelines: http://ecrc.ucdmc.ucdavis.edu/crc/layout/main.jsf Antimicrobial Stewardship CID 2007; 44: 159-77. |
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- f. Residents should also demonstrate knowledge for the diagnosis and management of the following major clinical syndromes:
 - Meningitis
 - Recognize clinical presentation of acute meningitis. Understand causative agents, diagnostic tools available and treatment. Recognize the differences in etiology and presentation in immunocompromised hosts.

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| Reference | N Engl J Med 2006; 354: 44-53. |
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- Sepsis
 - Recognize clinical and physiologic manifestations of sepsis.
 - Learn a thoughtful approach to discovering cause of syndrome.
 - Understand the appropriate use of antimicrobials in sepsis syndrome.
 - Learn the use of adjunctive therapies in the patient with sepsis.

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| Reference | N Engl J Med. 2006; 355: 1699-713. |
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- Urinary Tract Infections
 - Understand spectrum of illness: Pyelonephritis, cystitis, prostatitis, abscess
 - Know appropriate management issues in relation to the treatment and prevention of UTIs.

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| References | CID 1999; 29: 745-58, CID 2007; 44: 769-74 CID 2001; 33: 615-21 |
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- Skin and Soft Tissue Infections
 - Understand spectrum of illness including cellulitis, erysipelas, fasciitis, furunculosis, folliculitis and impetigo. Define the likely pathogen for each of these syndromes.
 - Know clinical manifestations, predisposing host factors, classic exposures, and appropriate treatment. In particular, understand the management of infections with Methicillin-Resistant *Staphylococcus aureus* (MRSA) differentiating hospital and community-associated strains.

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| Reference | N Engl J Med. 2007; 357: 380-90 |
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- Pneumonia
 - Learn to perform a physical exam to diagnose this infection
 - Develop knowledge of different bacterial, viral, fungal causes of pneumonia
 - Understand the treatment of pneumonia.

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| References | CID 1999; 29: 745-58; CID 2007; 44: 769-74 CID 2001; 33: 615-21 |
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- Endocarditis and intravascular infections
 - Understand the epidemiology in relation to etiologic agents and risk factors
 - Learn to perform a physical exam to look for the clinical manifestations of disease
 - Learn the utility and limitations of various diagnostic tests including echocardiogram.
 - Apply the modified Duke Criteria to help in determining the diagnosis
 - Learn treatment strategies for the management of endocarditis.

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| Reference | N Engl J Med. 2001; 345: 1318-30 |
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- Osteomyelitis and Prosthetic Joint Infections.
 - Recognize the common bacterial pathogens associated with osteomyelitis
 - Understand the utility and pitfalls of the various clinical, laboratory and imaging modalities used to diagnose and monitor disease
 - Develop knowledge concerning duration of therapy for osteomyelitis, based on pathogen, duration of illness and presence or absence of orthopedic devices

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| References | Infect Dis Clin North Am. 2005; 19: 765-86. JAMA. 1998; 279: 1537-41. |
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- HIV infection
 - Understand serology to establish the diagnosis of HIV infection
 - Develop knowledge about antiretroviral agents – indications, drug interactions, common side effects, development of resistance
 - Develop knowledge about role of resistance testing, interpretation of genotypic and phenotypic resistance tests
 - Develop knowledge about the clinical presentation, diagnosis and treatment of opportunistic infections

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| References | Guidelines for treatment of HIV and opportunistic infections: http://aidsinfo.nih.gov |
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- Coccidioidomycosis (cocci)
 - Understand the epidemiology of cocci, clinical presentation, diagnosis and therapeutic management of localized and disseminated cocci.
 - Understand the clinical presentation of localized and disseminated cocci
 - Understand the diagnostic approach to the patient with suspected or proven disseminated cocci
 - Understand the principles of antifungal therapy for localized and disseminated cocci, with an emphasis on the role of triazole agents

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| Reference | Clin Infect Dis. 2005; 41: 1217-23 |
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- **Tuberculosis**

- Understand the epidemiology of tuberculosis
- Understand the pathogenesis, clinical stages (latent versus active disease) and clinical manifestations of tuberculosis
- Understand the role of tuberculin skin testing in the diagnosis of tuberculosis, including interpretation of PPD skin test
- Become familiar with the use of antimicrobial therapy in the management of latent and active tuberculosis
- First line vs. second/third line agents
- Common side effects of antituberculous agents
- Periodic laboratory tests and clinical exams used to monitor for toxicity of antituberculous therapy

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| References | Am J Respir Crit Care Med. 2007; 175: 541-6 |
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- *Candida* species
 - Understand microbiology, pathogenesis, and pathologic findings.
 - Learn spectrum of clinical manifestations.
 - Thrush, esophagitis, cutaneous syndromes, fungemia and deep organ manifestations.
 - Know appropriate management of infections with *Candida* sp. as determined by cultures of blood or sterile body fluids; Endocarditis, line infections and peritonitis
 - Understand relationship between different species particularly the non-albicans candida and antifungal agents.

Reference

N Engl J Med. 2006; 355: 1154-9.

Practice-Based Learning and Teaching

- g. The resident must be able to critique his/her own performance.
- h. The resident must be receptive to constructive criticism.
- i. The resident should learn from his/her own errors and errors of colleagues.
- j. Actively educate colleagues, patients and self with a variety of sources of information.
- k. Access and critically evaluate the medical literature. This will demonstrate evidence of independent scholarship.
- l. Apply and open minded and analytical approach to acquiring new knowledge.

Interpersonal and Communication Skills

- m. Develop a good working relationship and rapport and communicate clearly to other physicians, other healthcare workers and patients.
- n. Present cases in a concise and focused manner. Understand what information is required to make an accurate and complete presentation (pertinent positives and negatives).
- o. Maintain comprehensive, timely and legible medical records.

Professionalism

- p. The resident is expected to demonstrate respect, compassion and integrity when working with patients and families.
- q. The resident is expected to demonstrate respect and integrity with fellow physicians and healthcare providers.
- r. The resident is required to adhere to HIPAA standards for patient confidentiality.
- s. The resident is expected to adhere to principles of scientific and academic integrity.

- t. The resident should demonstrate the ability to recognize and identify deficiencies in peer performance in a constructive manner.
- u. The resident must take responsibility for providing quality patient care.
- v. The resident must acknowledge mistakes without being defensive.

System-Based Practice

- w. Be able to understand the systems available for patient care.
- x. Work within regional and national medical systems to deliver optimal medical care.
- y. Maintain credentials to be an active member of the medical staff.

VII. Structure of the Rotation

a. Responsibilities of the Resident

1. The resident will be physically present at the appropriate site for the rotation. The resident will be provided all weekends free from clinical service while on the consultation service block. The resident will be responsible for being present from 7:00 AM – 5:00 PM. The residents will not be assigned night call. The resident must inform the program director regarding any schedule change.
2. Inpatient Consultation Service
 - a. The resident will be responsible for management of his/her patients
 - i. Determining the appropriate strategy for diagnosis and treatment of the patient.
 - ii. Suggest appropriate times to sign off of patients
 - iii. Residents will be released to go to clinic and conferences in a timely manner
 - iv. The resident will present cases to the faculty physician.
 - v. The resident will be responsible for interaction with the requesting services.
2. Outpatient Clinic at UC Davis Medical Center
 - a. The resident will see and evaluate patients referred to the clinic for consultation.
 - b. Residents will attend ID clinic 1-2 times per week on Weds and/or Thursday morning.
 - c. The resident will present the patients to the faculty physician to develop the plan for management.

VIII. Responsibilities of the Faculty

1. The faculty is assigned to the Inpatient Consultation Service in 2-week blocks. The faculty is also assigned to one Infectious Diseases Clinic at UCDMC.
2. The faculty member is expected to be present for rounds on the consultation service and in the clinic to staff the patients.
3. On the consultation service the faculty member is expected to perform teaching rounds daily.
4. In the clinic the faculty member is expected to see and evaluate all of the resident's patients and participate in the development of a plan of action.

5. The faculty member is expected to provide an environment conducive to learning.
6. The faculty member is expected to respond to questions appropriately.
7. The faculty member is expected to participate in weekly conferences such as journal club and case conference.
8. The faculty member must provide verbal feedback to the fellow at the end of each rotation.
9. The faculty member must provide written evaluations at the end of each rotation for the consultation service.