

# CURRICULUM: INFECTIOUS DISEASE

## I. GOALS

The field of Infectious Diseases comprises a very broad segment of Internal Medicine. A good internist should have a fundamental understanding of the basic microbiology of bacteria, fungi, viruses, and parasites. In addition he/she should have a good understanding of the clinical syndromes which are associated with various infections, including fever of unknown origin, sepsis syndrome, skin rash and fever as well as lymphadenopathy syndrome, septic shock, endocarditis, etc. Also a thorough understanding of commonly used antimicrobials, their toxicity and development of resistance and the clinical use of antimicrobials are required. All this cannot be learned during a one-month rotation in Infectious Diseases. Most of the clinical infectious diseases are to be learned during various ward rotations, emergency services, ICU rotation as well as rotation in the clinic, along with participation in the AIDS and STD clinics, various conferences, etc. The following is a broad outline of what we believe internists should accomplish at the end of the three-year residency at Saint Luke's Medical Center.

## II. CONTENT

### A. Microbiology

An internist should know about the basic microbiology of common bacteria, fungi, virus and parasites, methods of identification, the collection of specimens as well as transportation of specimens, how to prepare and interpret the gram stain and AFB stain, knowledge of antimicrobial sensitivity testing and the various tests that are available for serology including, ELISA and the Western blot tests. An understanding of the basic principles of immunology and immunological testing is important.

### B. Various Clinical Syndromes

These would include fever of unknown origin, sepsis syndrome, skin rash, fever and rash, lymphadenopathy, community acquired pneumonia, hospital acquired pneumonia, ventilator associated pneumonia as well as various soft tissue syndromes including necrotizing fasciitis.

### C. Organ System Based Infection

#### 1. Cardiovascular system

Endocarditis, pericarditis, myocarditis, mycotic aneurysms, infected vascular grafts and foreign bodies

#### 2. GI infections

Food poisoning, enterocolitis, pseudo membranous colitis as well as parasitic infections of the GI tract, peritonitis, spontaneous bacterial peritonitis as well as secondary peritonitis and peritonitis associated with dialysis, intra-abdominal abscesses, enteric fever syndromes

#### 3. GU infections

Urinary tract infection, prostatitis, and sexually transmitted infections including gonorrhea, syphilis, herpes, chlamydial infections, etc.

#### 4. Respiratory infections

Community acquired pneumonia, hospital acquired pneumonia, ventilator associated pneumonia, pneumonia in immunocompromised patients

#### 5. CNS infections

Meningitis, brain abscess, encephalitis, myelitis, epidural abscess

#### 6. Skin and soft tissue infections

Cellulitis, necrotizing fasciitis, myositis, impetigo

#### D. HIV

#### E. Infectious Etiologies

##### 1. Viral infections

Particular with emphasis on herpes infections, hepatitis (A,B,C,D&E), influenza, rubella, measles, mumps and to a lesser extent enteroviruses, cirbo-viruses, influenza, respiratory syncythical virus and particularly HIV virus.

##### 2. Bacterial infections

Staphylococcal, streptococcal infections, including rheumatic fever, enterococcal infections enterobacteriaceae, pseudomonas, other gram negative infections. Mycobacterial infections, both M. tuberculosis and non tuberculous mycobacteria (ie M. Kansasii, MAI, etc.)

##### 3. Fungal infections

Superficial and deep mycosis, particularly candida infections, cryptococcal infection, histoplasmosis, coccidioidomycosis, blastomycosis also aspergillus and mucormycosis

##### 4. Parasitic infections

Mainly intestinal parasites as well as protozoa, including malaria, toxoplasmosis, pneumocystis carinii

#### F. EPIDEMIOLOGY

The internist should have an understanding of the epidemiology of community and hospital acquired infections, travel associated infections, nosocomial infections including line sepsis, urinary tract infections, pneumonia and C difficile toxin associated colitis. The resident should understand how one can prevent nosocomial infections as well as community acquired infections. This should include isolation precautions as well as immunization and use of the prophylactic antibiotics.

#### G. SPECIAL HOSTS

Immunocompromised patients, alcoholics, geriatric patients, sickle cell disease patients

#### H. ANTIMICROBIAL THERAPY

Include antibacterial, antiviral, antifungal, antiparasitic as well as antimycobacterial agents. The internist should have a good understanding of various classes of antibacterial agents, including beta-lactams, aminoglycosides, vancomycin, clindamycin, monobactams, quinolones, sulfonamides agents, etc. Pharmacokinetics, pharmacodynamics and pharmaco-economics should be understood. Understanding the development of resistance of various bacteria and important mechanisms of resistance should give insight as to how to minimize this problem. The toxicity of the various antimicrobial agents and how to monitor antibiotic agents, adjusting of dosage in patients with renal failure, the principles guiding the empiric use of various antibiotics as well as selection of these agents for definite treatment as well as prophylaxis should be understood.

### III. TEACHING METHOD

Most teaching will be patient based. Teaching about Infectious Diseases takes place during many interactions with residents, including Morning Report, Attending Rounds, Morbidity and Mortality Conferences, Grand Rounds, Journal Club, Citywide Infectious Disease Rounds, as well as residents requesting "curb side" consults.

A. Infectious Disease Consultation Service

During one month of rotation in Infectious Diseases, approximately 30 to 40 new cases are seen among hospital inpatients, including ICU and CCU patients. The resident would be the first one to see these patients and he/she will evaluate the patient and present the patient to the supervising attending physician. The attending will in turn will review the case, including examining the patient, and critique the consult, discussing the teaching points as well as the management of the case.

B. Ambulatory Experience

1. HIV Clinic

In addition to taking care of infections in their own ambulatory patients that are seen in the ACC Health Care Center, the resident, during his Infectious Disease Rotation, participates in the management of patients in the HIV clinic. This meets once a week, every Tuesday morning. During the course of this clinic, the resident is expected to see about two to three patients with HIV infections, some of whom are asymptomatic, but most have advanced AIDS and various opportunistic infections as well as their own unique problems.

2. Dermatology

Each resident is expected to attend a dermatology clinic which is held on Thursday morning at SLMC during his Infectious Disease rotation. This clinic is supervised by a dermatologist. During each session, 8 to 10 common, as well as unusual, dermatological patients are seen and managed under the supervision of the attending dermatologist.

3. Sexually Transmitted Diseases

In addition to this, the residents will have exposure to sexually transmitted disease during their rotation in the ambulatory center as well as in the emergency department.

4. Emergency Service Rotation

C. Inpatient Experience

During the rotation in the regular medical wards, ICU and CCU, the medical residents will naturally be involved in management of routine as well as complicated infections and on many of these there will be an Infection Disease consultation. During this exchange, they will have the opportunity to interact, ask questions and learn about the management of various infections, including use of various antibiotics, antifungal agents and antiviral agents.

D. Microbiology Lab

During their rotation in Infectious Disease Service, the medical residents are expected to get orientated to the microbiology lab. The Director of Microbiology discusses with them the routine procedures that are used in identifying the bacteria, processing of blood cultures and various other specimen. Also in microbiology they learn the microtube dilution method of sensitivity testing. The resident will also have an exposure to virology and immunology labs during this rotation.

E. Conferences and Lectures

During the infectious disease rotation, they are expected to attend Infectious Disease Journal Club, which is held every Wednesday morning. Some of the topics that are not covered routinely on wards are addressed in the subspecialties lectures during noon conference as well as in Journal Club in the Department of Medicine, in Morbidity and Mortality Conferences and other lectures given by various general internists and specialists including the pulmonologist, rheumatologist, neurologist, cardiologist and hematologist. The residents also are encouraged to access the literature as it pertains to individual cases in terms of more diagnostic information and pathophysiology as well as management of complicated cases they encounter during ward rotations, outpatient department or infectious disease rotations.

F. Reading Material

The medical residents are expected to review the infectious disease sections in either Harrison's or Cecil's textbook of medicine. They may also be given assignments to read in Mandell's textbook of Infectious Diseases, the Mayo Clinic Manual on Antibiotic Therapy, Bartlett's Manual on Management of HIV Infection as well as the Infectious Disease Handbook by C. Isada.

**IV. EVALUATION (see introduction)**

A. EVALUATION OF THE RESIDENT

This takes place during the rotation in Infectious Disease Division. They will have a pre- and post- test utilizing a set of questions from MKSAP. In addition, they will be evaluated by the supervising attending with regards to their personal character, moral and ethical standards, reliability, responsibility, empathy and other humanistic qualities. At the end of the rotation the resident will have an exit interview with the supervising attending physician.

B. EVALUATION OF THE PROGRAM

The program will be evaluated based on the results of the in-service examination and the board examination results pertaining to the infectious disease section. Also during the exit interview each resident will be asked about their experience in the infectious disease rotation. The program director conducts an exit interview at the completion of the training. During this time, an evaluation of the Infectious Disease Program occurs. The curriculum evaluation committee will meet approximately once every six months to evaluate the content as well as the success of the program.

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