

Pathophysiology Curriculum

Educational Purpose and Goals

It is crucial for practicing Infectious Disease physicians to stay abreast of new developments in the field. Understanding how to critically read literature and perform pathophysiology studies properly is necessary for optimal patient care. Additionally, fellows are required to participate in scholarly activity. As part of the pathophysiology rotation, fellows will learn about proper evaluation of the medical literature and study design, will perform basic and/or clinical investigations, will understand importance of patient informed consent procedures and patient selection in clinical pathophysiology protocols, learn to collect results in an organized and manageable fashion, learn to analyze data utilizing valid statistical methods, understand the basic techniques of pathophysiology laboratory procedures, learn the proper way to write the results for presentation and publication, and understand the issues of authorship, plagiarism, and research integrity. Fellows will be assisted in preparing grant applications for specific pathophysiology projects, as appropriate. Commitment to this process allows the fellow to develop a more critical review process to published literature.

Principal Teaching Methods

Vincent Young MD, PhD, is the Director of Research for the Infectious Disease Fellowship program. Other participating faculty members include Drs. Havlichek, Nettleman, Gulick, Farnum and Dr. Gary Stein (PharmD.). There are ongoing basic and clinical projects at Michigan State University and Sparrow hospital that the fellow may join. Fellows may also choose pathophysiology rotations with any of MSU's basic scientists after submission of an acceptable plan to Dr. Young and Dr. Havlichek. Fellows will learn via independent literature review, performance of experiments, recruitment of patients into clinical trails, and writing of abstracts and articles. The director will also provide important articles and texts for review. Fellows will be directly supervised in patient care activities by the attending physician staff.

Educational Content

Mix of diseases: Fellows are exposed to a wide variety of infectious diseases problems on the pathophysiology rotation. These include, but are not limited to, the febrile patient, upper respiratory, pleuropulmonary, and bronchial infections, urinary tract infections, cardiovascular infections, central nervous system infections, skin and soft tissue infections, prosthetic device infections, infections related to trauma and bites, gastrointestinal

infections, bone and joint infections, infections of the reproductive organs, viral hepatitis, HIV related opportunistic infections, infections in immunocompromised or neutropenic patients, infections in patients with leukemia or lymphoma, infections in geriatric patients, infections in travelers, use and management of antimicrobial agents in the outpatient setting, and infections in parenteral drug abusers.

Patient characteristics. A diverse patient population is served in Lansing and MSU. Patients include both gender groups as well as individuals of a broad spectrum of ethnic, racial and socioeconomic backgrounds. Fellows will also have contact with some of the international students that are present on the MSU campus. Fellows will be exposed to the unique social, family, behavioral, and economic issues faced by outpatients and participate in patient counseling and community education, as appropriate

Learning venues: Patient encounters will occur at the MSU Clinical Center, the HIV/Virology clinic, and Sparrow Hospital. Clinical pathophysiology assessments may take place at Sparrow Hospital or via computer assisted data base evaluations. Basic science pathophysiology assessments may take place at Sparrow Hospital, the Food Safety and Toxicology Bldg, or the General Infectious Diseases Laboratory.

The General Infectious Diseases Research Laboratory is located in the Life Sciences Building on the MSU campus (1500 sq feet). Additionally, Dr. Young's Laboratory is located in the Food Safety and Toxicology Building on the MSU campus (1000 sq feet). Both labs have up to date equipment and capacity for fellow training. There are currently ongoing basic science projects evaluating the intestinal microbiota in health and disease, pharmacokinetics and pharmacodynamics of antimicrobial agents. Clinical Infectious Disease trials are ongoing at Sparrow Hospital. Other basic science and clinical pathophysiology opportunities exist in the Department of Microbiology, College of Veterinary Medicine, and the Department of Epidemiology at Michigan State University. Financial support is incorporated in the budget for each fellow.

Structure of rotation: In their first year of the program, fellows will be exposed to a variety of ongoing pathophysiology programs available. By the end of the first year, the fellow will choose at least one project to complete in the second year. The fellow will be responsible for developing a project, with an assigned mentor, that will result in presentation at a national meeting and a submission to a peer reviewed journal. While on the pathophysiology rotation fellows will continue to have outpatient clinic responsibilities in both the HIV clinic and General ID clinic (See Schedules). They will also attend all conferences, round on appropriate weekends (1/4). They are expected to read and be prepared to discuss key literature.

Principal Ancillary Educational Materials

There is no principle text for this rotation. Fellows have access to web based resources and other texts and videos through the hospital and University libraries. The fellow is expected to generate appropriate literature to review concerning their project. The project director will also provide important articles and texts for review.

Methods of Evaluation

Fellow Performance: At the end of the first year, Dr. Young will summarize and accurately describe the fellow's performance, discuss this evaluation with the fellow and return the form to the residency director.

In the second year of the fellowship, a quarterly evaluation by Dr. Young, in consultation with any other mentors, will occur. The evaluation is competency-based, fully assessing core competency performance. The evaluation will be part of the fellow file and will be incorporated into the semiannual performance review for directed fellow feedback

Semiannually the fellow will be evaluated by the program director in a formal, written evaluation session. These evaluations will be transcribed and signed by both the residency program director and the fellow.

Program and Faculty Performance: The fellow will summarize and accurately describe faculty performance, facilities, and experience at the end of the first year and return it to the program office for inclusion in a computer-generated report to insure fellow anonymity. The Fellowship Training and Evaluation Committee will review results annually.

Institutional Resources: Strengths and Limitations

Strengths: A commitment to pathophysiology with funds budgeted for this. A University that is skilled in both basic and clinical science.

Limitations: None

Rotation Specific Competency Objectives

Patient Care

This rotation is not primarily a patient care rotation. F-1 fellows are expected to collect data precisely, logically, and efficiently, perform focused physical exams approaching the level of a sub specialist, demonstrate clinical reasoning in ambiguous situations, establish monitoring procedures to assess needs for changes in therapeutic programs or adverse side effects, apply public health policies to patient care and possess knowledge of common ID syndromes/diseases sufficient

to appropriately manage common Infectious Disease syndromes/diseases. Fellows will be responsible for medical record documentation, as appropriate, under the supervision of the medical attending.

In addition to the F-1 expectations, F-2 fellows are expected to appropriately manage common and uncommon ID syndromes/diseases sufficient to establish a subspecialty focused differential diagnosis, establish an appropriate management plan to determine need for changes in diagnostic and therapeutic interventions, observe patients for adverse side effects, and apply public health policies to patient care.

If the fellows' pathophysiology project involves human subjects, the fellow will demonstrate the ability to evaluate subjects for:

- Protocol inclusion and exclusion criteria
- Adherence to the protocol
- Side effects of therapy
- Appropriate completion of records

Medical Knowledge

F-1 fellows will possess knowledge of and demonstrate growing understanding of their pathophysiology project, lead teaching of residents and students regarding the project. Fellows will display self-initiative to stay current with new medical literature, and demonstrate knowledge of this literature on the impact of their study design and validity or applicability to the project. Fellows will read appropriate texts and articles and be prepared to discuss key literature.

In addition to F-1 expectations, F-2 fellows are expected to demonstrate sufficient knowledge to sit for the ABIM certification examination, and demonstrate expanded knowledge to lead teaching of residents, students and the F-1 fellow.

Interpersonal and Communication Skills

F-1 fellows will engage in shared decision making, conduct meetings as appropriate, successfully negotiate nearly all difficult encounters unaided, function as a team member with minimal reliance upon attending physicians, and effectively communicate with co-workers.

Fellows will be able to demonstrate appropriate consultative principles of communication with co-workers and responsiveness to professional requests.

In addition to F-1 requirements, the F-2 fellow will engage in constructive leadership activities for the F-1 fellow.

Professionalism

F-1 fellows are expected to exhibit honesty and trustworthiness, reliability in their duties, as well as demonstrate integrity, compassion, and respect in their interactions with colleagues from the same or different cultures/ages/sexes.

Fellows will be responsible for complete and prompt data collection and proper legible documentation.

In addition to F-1 requirements, the F-2 fellow will demonstrate professional service to Infectious Diseases community through participation on appropriate committees, conference participation, and outside service.

Practice Based Learning and Improvement

F-1 fellows will appraise and assimilate scientific literature, integrate evidence based medicine, expert opinion and professional judgment, suggest and utilize data driven protocols, respond to the questions of co-workers, demonstrate self-initiative in the use of information technology available via the hospital library, the MSU electronic library, or the internet to access and retrieve materials for performance improvement. Fellows are expected to show progressive self-learning throughout the rotation, with emphasis on learning from any cognitive or procedural errors.

In addition to F-1 requirements, the F-2 fellow is expected to work with and/or lead teams that generate a constructive learning.

Systems Based Practice

The F-1 fellow will demonstrate understanding of complexity of interactions between multiple agencies, as appropriate, partner with other organizations to identify and act on improvement opportunities in the health care system, practice within external regulations and expectations, conserve resources while performing high quality work.

In addition to F-1 requirements, the F-2 fellow will demonstrate leadership and cooperative management in pathophysiology projects.