Infectious Diseases

Curriculum/Syllabus

Revised June, 2018

Table of Contents

Overview of Infectious Diseases Training Program
Internal Medicine Infectious Diseases Fellowship Training Program
Saint Louis University School of Medicine

The Division of Infectious Diseases in the Department of Internal Medicine at Saint Louis University School of Medicine provides training for fellows. The term "subspecialty resident" is often replaced by the term "fellow," and we use them interchangeably. The duration of the subspecialty training is two years and consists of clinical and research training. Additional research training is available. The overall responsibilities, goals, and objectives for the fellow are detailed in a syllabus which is distributed to each trainee. The syllabus is designed to supplement the major medical textbooks and Infectious Diseases textbooks.

I. Goals

The overall goal of the Subspecialty Training Program in Infectious Diseases is to prepare the trainee for a career as an Infectious Diseases subspecialist certified by the American Board of Internal Medicine. Saint Louis University seeks excellence in the fulfillment of its corporate purposes of teaching, research, health care and service to the community. During the fellowship, Mission and Values of Compassion, Respect, Excellence, Stewardship and Community are lived out every day. We use them to guide our decisions and how we treat one another.

A. Goals of the Clinical Infectious Diseases Trainee Program

- to prepare fellows (residents in Infectious Disease) in the diagnosis and treatment of adult infectious diseases, including acute and chronic community acquired infections as well as nosocomial infections
- to develop the clinical and literature research skills required to determine the most current information for the care of an individual case
- to provide experience and education in the proper use of anti-infective agents
- to provide expertise in communications with the clinical microbiology laboratory and anatomic pathology department in the evaluation of patients with infectious diseases
- to prepare verbal and written presentations of patient information, topic review, and current infectious diseases literature

B. Goals of the Research Infectious Diseases Trainee

- to develop skills in formulating, conducting, analyzing and reporting clinical and laboratory research projects
- to prepare the fellow to independently conduct clinical or laboratory research projects

II. Objectives

A. Specific objectives of the Clinical Infectious Diseases Trainee

- acquire an advanced understanding of host defense mechanisms and immune responses in relation to infectious diseases

- acquire an advanced understanding of the etiology, pathogenesis, diagnosis, and therapy of patients with the following infectious diseases problems:
    1. fever of unknown origin
    2. fever associated with skin rash
    3. mimics of infectious diseases
    4. eye infections
    5. upper respiratory tract infections
    6. lower respiratory tract infections
    7. urinary tract infections
    8. intra-abdominal infections
    9. infective endocarditis and intravascular infections
    10. central nervous system infections
    11. gastrointestinal infections
    12. bone and joint infections
    13. sexually transmitted diseases and diseases of the reproductive tract
    14. HIV/AIDS
    15. hepatitis
    16. skin and soft tissue infections
    17. sepsis and shock syndromes
- acquire an advanced understanding of common bacterial, viral, fungal, and other infectious agents and their relationship to clinical infectious syndromes
- acquire an advanced understanding of the etiology, pathogenesis, diagnosis and therapy of patients with human immunodeficiency virus infections and associated opportunistic infections
- acquire an advanced understanding of the etiology, incidence, and predisposing factors of nosocomial infections such as the management and maintenance of indwelling vascular catheters
- acquire an advanced understanding of infections in special hosts (eg, transplant recipients, patients on biologics, neutropenic patients and HIV infected patients)
- acquire an advanced understanding of anti-infective therapy including susceptibility testing, resistance mechanisms, pharmacodynamics and pharmacokinetics
- acquire an advanced understanding of toxins and virulence factors of infectious agents
- acquire an advanced understanding of the principles and use of vaccines
- acquire a basic understanding of the principles and methods of epidemiology in relationship to infectious diseases
- acquire a basic understanding of medical ethics in medical practice and research
- acquire a basic understanding of the use of statistics in medical practice and research

- acquire an advanced understanding of infectious agents that have potential use for bioterrorism
- acquire training in system-based medical practice

B. Specific Objectives of the Research Infectious Diseases Trainee

- formulate hypothesis for the selected research proposal
- develop methods specific to the research plan, including assessment of the necessary laboratory tests, groups of animals, or number of patients using statistical methods
- understand procedures for obtaining Institutional Review Board approval by human studies committee if applicable
- become proficient in laboratory assays required in the research proposal
- analysis of the data including computer programs, statistical methods, and tabular and illustrative graphs
- formulate the analyzed data into abstract or manuscript form for presentation and publication
- understand ethical issues of human and animal research

III. Environment

The Division of Infectious Diseases utilizes the Saint Louis University Hospital, Cardinal Glennon Hospital, the St. Louis Veterans Administration Hospital, the Center for Vaccine Development, and the New Hope Comprehensive Clinic (HIV Clinic) for clinical rotations for the Clinical Infectious Diseases trainee. The patient population includes a wide variety of infectious diseases problems. At Saint Louis University Hospital, active programs in HIV and transplantation (liver, kidney, pancreas, and hematopoietic stem cell [HSC]) provide a broad experience in unusual and opportunistic pathogens in addition to the routine medical problems of general internal medicine inpatients. Additional experience in surgical infectious diseases is gained by consultation on the trauma, neurosurgical, orthopedic and general surgery services. ~~The regional hemophilia center at Saint Louis University, and the general population in St. Louis provides experience in patients infected with HIV.~~ Additional clinical experience is obtained in pediatric infectious diseases at the Cardinal Glennon Children's Hospital.

The learning environment centers around the expertise of 1~~7~~4 faculty members with a wide variety of clinical and research interests. In addition, the Infectious Diseases fellows actively participate in the education and training of Internal Medicine residents. The clinical microbiology and virology services play an integral role in the education of fellows. The Center for Vaccine Development, the Division of Infectious Diseases research labs, and the resources of the Saint Louis University School of Medicine are available for research projects.

IV. Methods

A. Clinical Infectious Diseases Training

The fellows and specialty (Internal Medicine) residents are directly supervised in Infectious Diseases consultation by a faculty member.

Patients referred to the Infectious Diseases Service for consultation are assigned by the supervising fellow to him/herself, another fellow or an IM resident. The assigned fellow or Internal Medicine resident is responsible for the initial evaluation of the patient, review of pertinent laboratory and radiology data, and formulation of the differential diagnosis and treatment plan. The consultation and recorded note is presented to the faculty member for review, discussion, and additional recommendations. The attending physician confirms these findings at the bedside with the patient and resolves any discrepancies of the evaluation. The fellow in conjunction with a faculty member is responsible for the supervision of Internal Medicine residents and medical students on the Infectious Diseases Service.

Follow-up of consultations is performed by the fellow or Internal Medicine resident and supervised by the attending physician. Rounds are conducted with the attending physician on a daily basis on patients referred to the Infectious Diseases Service.

All progress notes on the patients assigned to the fellow or Internal Medicine resident are written by the resident, reviewed, edited and signed by the attending physician in the electronic health record (EHR).

Fellows and Internal Medicine residents are required to attend the weekly Clinical Case Conference, Current Topics in Infectious Diseases Conference, Review of Immunology Conference, and Clinical Microbiology Conference. In addition, the fellows are required to attend Subspecialty Didactic Conference, a designated series specifically for fellows. The fellow and Internal Medicine resident, under supervision of the attending physician, is required to present selected patients at the Clinical Case Conference and discuss the disease process and management of the patient. In addition, each fellow is responsible for the review, presentation and discussion of articles from the recent literature at the Current Topics in Infectious Diseases Conference and review and presentation of up to date information at Immunology Review Conference. The fellow is also responsible for one presentation at Infectious Diseases Research Conference.

Topics Taught	**Teaching Methods**
• History, Physical Exam	• Supervised practice experience • Case presentations on rounds • Direct observation
• Clinical Microbiology	• Daily laboratory review • Clinical Microbiology Conference • One block rotation in clinical microbiology
• Clinical Infectious Diseases problems	• Textbook reading • Small group case tutorials • Topic review • Discussions on attending rounds • Web-based information
• Use of antimicrobials	• Lectures • Textbook • Web-based information (eg, guidelines)

- Discussions on attending rounds
- One block rotation in antimicrobial stewardship

- Anatomic pathology in Infectious Diseases
- Laboratory review
- Recent literature
- Current Topics in Infectious Diseases Conference
- Clinical Case Conference
- Literature Review

B. Research Infectious Diseases Training

The fellow selects a faculty member to directly supervise the research training. The faculty member and fellow work together in an apprenticeship method in the design, approval, implementation, data analysis, and presentation of the research project. The fellow is evaluated by the mentor on his/her ability to develop a hypothesis and research protocol, the ability to manage time and prioritize goals, his/her ability to analyze the data and to see the project to completion, including presenting at research conference as well as submitting for publication. Prior to starting a research project, the fellow is expected to present their research project to the faculty during a conference. The research is presented by the fellow at the Infectious Diseases Research Conference with review and criticism by the Infectious Diseases faculty. An abstract and manuscript are authored by the fellow under the supervision of the assigned faculty member.

Goals and Objectives for Research During Infectious Disease Training

Goals

1. Fellows in the Division of Infectious Diseases are expected to develop skills useful in formulating, conducting, analyzing and reporting clinical and laboratory based research projects. The general mindset necessary for approaching clinical and more basic research questions with a scientific mechanistic approach is to be developed. Although the skills necessary for the achievement of these goals will be developed more fully in fellows who participate in additional training, trainees seeking a two year fellowship also will be expected to pursue achievement of these goals.

Objectives

1. Development of an approach to formulating questions and hypotheses which can be answered in an organized scientific fashion.

2. Development of a research plan. This includes assessment of the necessary groups of patients needed in a clinical trial to determine, for instance, in a retrospective study this may include predictors of treatment outcome. In the case of laboratory research, this would include, e.g., the determination of the number of groups of animals or *in vitro* laboratory tests needed to explore the validity of a primary hypotheses.

3. Acquisition of skills, by practical experience, necessary to carry out the methods used in creating a research plan and procedures listed in 2. The skills would include the ability to formulate and write the study hypothesis and objectives, overall study design, and study procedures; understanding procedures for obtaining institutional approval of proposed projects using -human and animals and other research related committee approvals; acquisition of laboratory skills to carry out planned laboratory assays; and the creation of grant applications.

4. Initiation and implementation of the planned research activity.

5. Analysis of clinical and laboratory data generated during a research study. Utilize methods of data reduction including computerized programs, apply statistical methods to analyzing the data, and using tabular and illustrative graphs to present the data in an understandable fashion.

6. Formulation and dissemination of data using -a variety of formats including abstracts and oral presentation or posters sessions at scientific meetings, and writing manuscripts for submission to a peer-reviewed scientific journal.

V. Evaluations

A. Clinical Infectious Diseases Training

The supervising faculty member is directly responsible for the evaluation of the fellow on the Clinical Infectious Diseases Service. Additional input can be obtained from other faculty members who have observed the performance of the fellow. Evaluations are performed each block on the inpatient rotation and every six months in the clinic experience. If deficiencies in the fellow's performance are observed, immediate discussion and correction of the deficiency is accomplished by the faculty member responsible for the Clinical Infectious Diseases Service. Fellows who fail to correct deficiencies are referred to the Division Director and the ~~Residency Evaluation~~Clinical Competency Committee for Infectious Diseases. Each fellow's performance is reviewed by the Program Director every six months with a yearly and final evaluation at the completion of training.

The ~~Residency Evaluation~~Clinical Competency Committee for Infectious Diseases consists of ~~the~~ 2-3 full-time faculty and is chaired by the Program Director. The committee will evaluate each fellow's performance at least ~~on an annual basis~~twice a year.

Additional evaluations will be performed by ancillary personnel who have contact with the Infectious Disease fellow.

The faculty on the Clinical Infectious Diseases Service will be evaluated with a written electronic evaluation by each fellow after each block. Evaluations will be reviewed by the Division Director of Infectious Diseases and this information will be communicated to individual faculty members.

B. Research Infectious Diseases Training

A written summary of the fellow's performance is provided to the Program Director of Infectious Diseases.

Subspecialty Program In Infectious Diseases

Inpatient Facilities - Experience

The inpatient facilities of Saint Louis University include Saint Louis University Hospital (308 beds) and Cardinal Glennon Children's Hospital (250 beds). The University Hospital is a tertiary care hospital providing subspecialty medical care, transplant surgery, and cardiac surgery for patients referred from throughout the regional area. Cardinal Glennon Children's Hospital provides primary, secondary, and tertiary care of children. Consultations for the instruction of fellows are drawn from these institutions.

The fellow serves as a consultant on seven to ten new consults per week and is responsible for the follow-up ~~visits, and~~visits and has direct responsibility for Infectious Diseases Clinic patients who are hospitalized. The average number of new consults is approximately 300 and 100 in the first year and second year of training, respectively, with a total of 400 new consultations during the subspecialty training period. More than one fourth of these consultations are in immune compromised hosts.

The fellow rotates at one institution at a time. For one block of the first or second year, the Infectious Disease fellow rotates on the Cardinal Glennon Children's Hospital Infectious Diseases Service.

The fellow is not directly responsible for the inpatient management of infectious disease problems but serves as a consultant at the institutions listed above. The fellow is not expected to write orders on the charts of these patients; this is the responsibility of the primary inpatient service (internal medicine, surgery or pediatrics, for example). Patients are followed for the duration of their active infectious disease problems while an inpatient. When the infectious disease problems are completed, the consultation service signs off the case. If a follow-up visit is needed in the outpatient clinic, the patient will be scheduled in the fellow's Infectious Diseases Clinic with documentation in the medical record in order to provide continuity of care and ~~long term~~long-term follow-up. This continuity benefits both the patient and the Infectious Diseases fellow. Supervision of outpatient intravenous antibiotics and ambulatory care of the HIV infected patient are the major reasons for follow-up care.

If both fellow/s and resident/s are rotating on the Infectious Diseases Service, they will share the patient care responsibilities. The Infectious Diseases fellow is responsible for administrative matters of the service and for education of residents and students.

A fellow and/or specialty resident and Infectious Diseases attending physician will be on call for Infectious Diseases consultations at all times. The call schedule for the fellow and specialty resident will be made by the program director and attending faculty on service. Each trainee will have an average of at least of one twenty-four hour period every seven days free of clinical responsibilities. ~~There is no night call for the specialty resident when a fellow is on service. However, the specialty resident is expected to be available if educational opportunities present themselves or if there is a service requirement in the absence of a fellow.~~ If there is no fellow on service during the month the attending physician ~~will~~ may take call on a regular basis. All call is taken from home. An on-call schedule will be ~~assigned~~assigned, and that schedule will be distributed to the hospital operators and Infectious Diseases attending physicians. Changes in the schedule must be approved by the responsible Infectious Diseases attending physician.

Medical students on the clinical Infectious Diseases elective are assigned to the fellow and/or specialty resident. The students will be active members of the consult team and will be supervised by the fellows, specialty residents and attending physicians. Every attempt will be made to have the student see the patient first or simultaneously with a resident. A student may choose to be on call with the fellow and specialty resident, but this is not mandatory.

When possible, the fellow and/or specialty resident will see new and ongoing cases before the Infectious Diseases faculty attending. At times, it may be beneficial for the attending and the team to see the patient together, or the attending may prefer to see the patient first, but every attempt will be made for the student, fellow or specialty resident to see the patient initially. The organization of the clinical service may vary depending on the faculty member assigned as attending for that month.

Daily visits will be made on each patient unless otherwise determined by the Infectious Diseases attending physician. The Infectious Diseases attending physician will determine whether or not the patient should no longer be seen by the consult service. A progress note is necessary on most days. All relevant information and recommendations must be noted in the chart. If new recommendations are made to change patient care or order new studies, the student, fellow or specialty resident assigned to the patient must notify the house staff caring for that patient during rounds. If important questions arise at the time of seeing the patient on work rounds, the specialty resident or fellow should immediately contact the Infectious Diseases attending physician for advice. Otherwise, the patient can be reviewed and evaluated during attending rounds with the attending physician.

Internal Medicine residents must attend their assigned general medicine clinics during the month on Infectious Diseases rotation. It is the responsibility of the resident to round on their assigned patients, round with the attending and sign out to the fellow prior to leaving for clinic. Specialty residents or fourth year students wishing to attend other clinics must have approval of the attending on service.

At any given time the Infectious Disease fellow has immediate responsibility for up to 15 patients at the Saint Louis University Hospital but has responsibility for oversight of the whole team. Fellows see different types of diseases in caring for patients admitted to different services. The university hospital has many immunosuppressed patients due to HIV, transplantation on the Solid Organ Transplant Service (liver, kidney and pancreas) or the Hematopoietic Stem Cell (HSC) Transplant Service. Fellows see a broad range of general ID both at SLU Hospital and Cardinal Glennon Children's Hospital. These two institutions present a broad range of acute and chronic infectious disease problems.

Ambulatory Care Facilities - Experience

The outpatient clinics for the Infectious Diseases Service are located in the New Hope Clinic one block from the Infectious Diseases offices and Saint Louis University Hospital. The fellow has one clinic per week from 8:30am – 12:00pm. The clinic ~~consists~~ exists principally for conducting outpatient follow-up visits on patients previously hospitalized, for the management of patients on home IV antibiotic, or for the management of HIV infected persons. In addition, new consultations are seen in these clinics.

The fellow will attend approximately 50 outpatient clinics per year. The average number of patients examined per clinic will be 6-7, including one new patient visit, resulting in approximately 300 patient visits per year, or 600 visits in two years. The fellows have primary responsibility for the ambulatory care of Infectious Diseases Clinic patients and hospital follow-up visits. They are always supervised by an attending physician in Infectious Diseases who will review the care and sign off on each patient visit. It is expected that the fellows will make the majority of decisions, with difficult decisions made in consultation with the attending physician.

Continuity of care is provided by arranging for fellows in Infectious Diseases to maintain an outpatient clinic for the follow-up of patients who were previously evaluated and treated on the inpatient service. This outpatient clinic is maintained throughout the Subspecialty Residency Training. This experience includes the continuous management of patients with all stages of HIV infection over a ~~24 month~~24-month period.

Educational Program

The faculty conduct patient care and teaching rounds daily. It is expected that the fellow, residents, and students will have previously performed their morning work rounds prior to faculty conducting teaching and patient care supervision rounds. Attending physicians make rounds seven days a week.

Initial education measures include didactic lectures, conferences, web-based reviews of published guidelines and textbook reading. As the fellow progresses, individual literature review and library research is performed in preparation for patient care, research conferences, and clinical rounds. Funds are available to support fellow educational needs including attendance at national meetings and symposia, books and journals.

The fellows are responsible for presentation of clinical cases at the weekly Clinical Infectious Diseases Conferences including a brief report of recent relevant literature related to the clinical case presented. Each resident presents at least one case and brief literature review weekly while on the clinical service. In addition, presentations at Journal Club~~,~~, and ~~Immunology Review and~~ Research Conference are required. On occasion, Medicine Grand Rounds cases are presented jointly by senior fellows and faculty.

Each fellow will be responsible for one research conference in years 2 and 3. The topic selection, literature review, visual aid preparation, and pre-conference rehearsal will be directly supervised by a faculty member for each conference. When appropriate, research is presented by the fellow at a national meeting.

Evaluation

The supervising faculty member is directly responsible for the evaluation of the fellow on all scheduled rotations. Online evaluations are performed each block, reviewable by the Program Director of Infectious Diseases. All evaluations become part of each resident's permanent file and kept in the Division of Infectious Diseases.

The ~~Residency Evaluation Committee~~Clinical Competency Committee for Infectious Diseases consists of the full-time faculty and is chaired by the Program Director. Annual evaluations of the fellows are reviewed by the ~~Residency Evaluation Committee~~Clinical Competency Committee. The Program Director reviews each fellow performance every six months through

the ACGME Milestone evaluation system. If deficiencies in a fellow's performance are observed, immediate discussion and correction of the deficiency is accomplished by the faculty member responsible for the clinical Infectious Diseases service. Failure to correct deficiencies are referred to the Division Director and the ~~Residency Evaluation Committee~~Clinical Competency Committee for Infectious Diseases. Fellows have the opportunity to read and respond to their evaluations with the supervising faculty member at the end of each rotation when the evaluation is signed by the faculty and fellow. Procedures which are directly supervised by the faculty member are incorporated into each written evaluation.

The faculty members are individually evaluated by the Division Director of Infectious Diseases and the Department of Internal Medicine on an annual basis. Evaluation of teaching, research, clinical activities, and service are incorporated in this evaluation. Fellow's input of each faculty member's performance is communicated to the Division Director at periodic intervals.

Evaluation of the training program by the residents is incorporated in the fellow's meeting with the Program Director.

In addition, review and evaluation of the training program is performed on an annual basis. Fellow input has been instrumental in modifying clinical rotations and responsibilities. Examples include: 1) curriculum revision, 2) redistribution of outpatient responsibilities in the New Hope Clinic, 3) input for recruitment of fellows and faculty, 4) modification of rotation in clinical microbiology, and 5) modification of the clinic and conference schedules.

Related Disciplines

Fellows in Infectious Diseases directly interact with the resident and fellowship training programs of surgery, psychiatry, pediatrics, internal medicine, obstetrics, radiology and pathology. Interaction occurs during inpatient consultation, clinic, direct care, and infection control activities. Fellows participate in the care of ambulatory patients in the New Hope Clinic under the direct supervision of a faculty member. This includes referral and consultation with the Home Health Department, Physical and Occupational Therapy, Pastoral Care as well as almost all medical and surgical services of Saint Louis University. The care coordinator for HIV patients and outpatient antibiotic therapy provides the opportunity to become proficient with systems based practice.

Cardinal Glennon Children's Hospital is used for pediatric Infectious Diseases rotations during which the fellow gains experience in a broad spectrum of pediatric infectious disease consultation under the supervision of a member of the Pediatric Faculty.

Saint Louis University has a Center for Health Care Ethics and information on ethical issues are integrated into the curriculum. In addition Saint Louis University Ethics Committee provides ethics consults for patient care issues. In addition, Internal Medicine Grand Rounds has sessions provided by the Center for Health Care Ethics. The fellows also take the IRB Human Subject' Protection training.

A one block rotation in clinical microbiology is required to understand the role of laboratory diagnosis in infectious diseases and proper interpretation of laboratory results. The rotation is supervised by the Director of the clinical microbiology laboratory and an electronic evaluation is performed at the completion of the rotation. There is also a scheduled weekly clinical Microbiology Conference.

A one block rotation in infection control is also required to understand the role of infection control program in the hospital. This rotation is done at the St. Louis Veterans Administration Hospital. The rotation is supervised by the infection control officer of the hospital and an electronic evaluation is performed at the completion. An appropriate course (CDC, SHEA) may be substituted for this experience with the approval of the Program Director of Infectious Diseases.

A one block rotation in antimicrobial stewardship is required to understand the role of antibiotics within the hospital community. This rotation is done at the St. Louis Veterans Administration Hospital and supervised by an ID faculty member and an ID-trained pharmacist. The fellow will learn how an Antimicrobial Stewardship Program works to improve patient care by optimizing selection, dosing, route and duration of antimicrobial therapy to maximize clinical cure or prevention of infection while limiting the unintended consequences, such as the development of resistance, adverse drug events and costs. An electronic evaluation is done at the end of the rotation.

One-half day per week one fellow will attend the Hepatitis C Clinic at the St. Louis Veterans Administration Hospital during elective blocks. The fellows will rotate so that, on average, each fellow will attend one- to two clinic sessions per 4-week block. This rotation is supervised by a hepatologist, and electronic evaluations are done at the end of each block.

Relationship to The Internal Medicine Program

The Infectious Diseases Division is an integral part of the Department of Internal Medicine. Each Internal Medicine resident is evaluated after participating in the Infectious Diseases Clinical Service, and the evaluation is submitted to the Internal Medicine Program Director. These evaluations are reviewed by the IM Residency Review Committee with recommendations submitted to the IM Program Director when appropriate. The ID Division Director is directly responsible to the IM Department Chairman for the faculty, curriculum, and fellows. Annual evaluations of ID faculty and fellows are submitted to the Chairman of the Department of Internal Medicine.

Patients from other services are seen in consultation at Saint Louis University Hospital. The fellows are responsible for all patients seen in consultation and assign patients to the Internal Medicine residents and students on the Clinical Infectious Diseases Service.

The fellow and attending physician are directly responsible for the supervision of medical students' and Internal Medicine residents' evaluations, diagnostic work-ups, and treatment plans for patients on the Clinical Infectious Diseases Service. In addition to the educational component of patient care supervision, the Infectious Diseases fellows participate in the didactic lecture series on selected topics in Infectious Diseases which is required of the students and residents on the Infectious Diseases rotation. Specialty residents and medical students are required to present at the Current Topics in Infectious Diseases Conferences during their experience on the rotation in Infectious Diseases.

Research

The Division of Infectious Diseases has extensive research activity in vaccine biology and basic infectious diseases research. Major ongoing clinical and bench research efforts are ongoing within the Infectious Diseases Division. They include: the Vaccine and Treatment Evaluation Unit (VTEU, an NIAID funded program for the evaluation of vaccines other than AIDS vaccines and treatments, eg, antibiotics), industry funded investigations primarily in vaccine development, such as flavivirus virus vaccines, and pediatric bacterial vaccines, and basic research funded by NIH on immunology (Dr. Hoft). Eighty percent of the research in the Division of Infectious Diseases is funded by NIH.

Fellows are required to participate in scholarly activity. Residents who plan a primary clinical career in Infectious Diseases are encouraged to undertake a clinical research project such as evaluation of an investigational vaccine jointly with a faculty mentor.

Scholarly activity leading to authorship on a paper submitted for peer review or presentation at a national or regional meeting or for publication is expected. The Infectious Diseases fellows are expected work with the mentor in developing the protocol, and submit the protocol to the IRB for approval. After approval, the fellow must adequate manage his/her time to complete the project within the specified amount of time. Data analysis is done through connection with a biostatistician. Presentation of the research, whenever possible, at a national scientific meeting is encouraged by the Infectious Diseases fellows, and this can be in either a poster session or oral presentation. Writing up the manuscript is ideally accomplished by the fellow, but on occasion this is done by the faculty member if the fellow has already left the program.

During the second year and beyond, fellows are required to present their research to the faculty during Wednesday morning research conference. The resident will select the research topic and work with the faculty mentor in developing the presentation, writing the slides, and presenting the material. Research material is generally based upon investigations carried out by the resident, and may be supplemented by a literature review.

Fellows are mentored in the knowledge of study design and interpretation of research studies by the full time faculty in Infectious Diseases, as well as the part time faculty biostatistican. Developing protocols and developing an informed consent are key features of the experience. Extensive experience by faculty in research methodology and interpretation of data is transmitted to the fellows through weekly interactions at the Current Topics in Infectious Disease Conference, Research Conference, and daily interactions with the faculty mentor who is supervising the research project.

Other Aspects Of Training

Instruction in the basic sciences is achieved by formal presentation at the Infectious Diseases Research Conference and formal lectures throughout the University and community. In addition, three members of the division have an MD/PhD degree, and their basic research is conveyed to the fellows through discussions at Journal Club, Research Conference, as well as Clinical Conference. Three members of the Division of Infectious Diseases are basic scientists with a PhD degree who also participate in Current Topic Conference and Research Conference and mentor students and residents in the laboratory. Residents are also provided basic science education through ongoing seminar series available at the Institute for Molecular Virology, the Department Molecular Microbiology, other seminars within the University and also at Internal Medicine Grand Rounds.

Fellows gain an understanding of the evaluation of medical literature through the Current Topics Conference (ie, "Journal Club"). Residents are taught how to critically review a manuscript, including biostatistical interpretation, clinical epidemiology, and clinical study design. Through Research Conference as well as Current Topics Conference, faculty mentors share their knowledge with fellows. Discussion of relative and absolute risks of disease, medical statistics, and medical decision making are an integral part of Infectious Diseases Clinical Conference, and ongoing discussion between faculty and fellows during patient care management, including medical decision making on rounds.

Residents acquire experience in the principals, objectives and processes of quality assurance, quality improvement, and risk management through participation in infection control activities and medical staff committees. There is also a formal QI and Safety curriculum and a monthly lecture series.

Residents acquire information and experience in cultural, social, family, behavioral and economic issues including confidentiality of information, and indications for life support systems in several ways. Two Internal Medicine Grand Rounds per year are devoted to ethical considerations in Internal Medicine. Furthermore, the Center for Healthcare Ethics is a research center located at Saint Louis University. Interactions with this group and Pastoral Care in the hospital provide important informational background to our students and other fellows. The social and economic impact of the resident's decisions on patients, physicians, and society are discussed primarily in the context of these ethical considerations.

On Call Responsibilities

Each fellow has at least one twenty-four hour period every seven days free of any clinical responsibilities. Coverage is provided by other fellows and attendings within the program. The on-call duties of the Infectious Diseases fellow are taken from home or pager and not from on site. Clinical responsibilities are usually completed by 7:00 pm on weekdays and 2:00 pm on weekends and holidays.

Saint Louis University Medical Center

Medical Student, Internal Medicine Resident and Infectious Disease Fellow Responsibilities While Rotating on the Clinical Infectious Diseases Consultative Service

Outlined below are the responsibilities of the student, specialty resident and fellow when they are participating in the Clinical Infectious Disease Service. The responsibilities of the individual team members are within the guidelines of the teaching mission and the service mission.

1. If both fellows and specialty residents are rotating on the Infectious Diseases Service, the specialty resident will share the patient responsibilities with the Infectious Diseases fellow including arrangement of outpatient antibiotics and home care and teaching students on the team.

2. A fellow and/or specialty resident along with an attending will be on call for infectious diseases consultations seven days a week. The call schedule for the specialty resident and fellow will be made by the Program Director and the Attending Faculty on service. In general there is no night call for the specialty resident when a fellow is on service. However, the Internal Medicine specialty resident will be expected to be available if educational opportunities present themselves or if there is a service requirement in the absence of a fellow. If there is no fellow on service during the month the specialty resident will take call on a regular basis but will always have, on average one 24-hour period every seven days free of any clinical responsibilities. All call is taken from home. An on-call schedule will be assigned and that schedule will be distributed to the hospital operators and Infectious Diseases physicians. Changes in the schedule must be approved by the Infectious Diseases Attending physician. Each trainee will have an average of one twenty-four hour period every seven days free of clinical responsibilities. The attending physician has final responsibility for all patient care responsibilities.

3. Follow-up New Hope Clinic visits for inpatients will be coordinated by the sub-specialty resident responsible for the patient's care while in hospital. These visits will be scheduled through the New Hope Clinic (314-977-9050). Requests for routine outpatient consultation will be referred to the new Hope Clinic (314-977-9050) for scheduling. A patient must have a referral from a physician, except if the reason for care is HIV infection. Requests for any urgent outpatient consultation will be referred to the Clinic Director (Dr. Marcia Sokol-Anderson) or her designee and will require direct communication from the attending physician requesting the urgent outpatient consultation.

4. During the clinical and other rotations of each fellow, there is no in-house call. During a 14 day period, there are two days completely free of clinical responsibilities; there are two weekend days of approximately six hours of duty each, and 10 days of 10-12 hours duty. In a 14 day period, there would be a maximum of 132 hours which would result in a 66 hour work week maximum. This is 14 hours below the 80 hour per week duty requirement. Any additional time spent (rare instances of emergency consultation) requiring return to hospital after daily duty is completed is added to the total. All trainees will log their duty hours through New Innovations, which will flag the Program Director of any violations.

5. Medical students may be assigned to the fellow and/or specialty resident. The students will be active members of the consult team and will be supervised by the fellows and specialty residents. Every attempt will be made to have the student see the patient first or simultaneously with a

resident. A student may choose to be on call with the fellow and specialty resident, but this is not mandatory. Students are not required to be present on weekend or holidays.

6. When possible, the fellow and/or specialty resident will see new and ongoing cases before the Infectious Diseases faculty attending. At times, it may be beneficial for the attending physician and the team to see the patient together, or the attending physician may prefer to see the patient first, but every attempt will be made for the student, fellow or specialty resident to see the patient initially. The organization of the clinical service may vary depending on the assigned attending physician for that month.

7. Rounds will be made on each patient each day unless otherwise determined by the Infectious Diseases Attending Physician. The Infectious Diseases Attending Physician will be asked whether or not the patient should be discharged from the consult service. A progress note is necessary daily on most patients. All relevant information and recommendations must be noted in the chart. If new recommendations are made to change patient care or order new studies; the student, specialty resident or fellow assigned to the patient must notify the house staff caring for that patient during rounds. If important questions arise at the time of seeing the patient on rounds, the fellow or specialty resident should immediately contact the Infectious Diseases attending physician for advice. Otherwise, the patient can be reviewed or seen with the attending physician on attending rounds.

8. Fellows will use the Electronic Medical Record (EMR) and visit the microbiology lab if needed on a daily basis in order to follow the progress of each patient's cultures. It is of utmost importance to know exactly the status of laboratory data. Information such as "the results are not back" (in the chart) is unacceptable.

9. There are a number of ongoing clinical studies that require awareness of the Infectious Diseases team. The infectious diseases faculty will inform you of these various studies so that we may enroll patients.

10. The fellow, when on service, will maintain the ID Patient List in EPIC. Only the fellow and/or attending should add or remove patients from this Master List.

11. Current Topics in Infectious Diseases Conference (aka "journal club") will be held on select Monday mornings promptly at 8 am. The fellow and specialty resident on the Infectious Diseases Service are required to attend and participate in this conference. Medical students are required to attend, and in most cases, will be required to present but the decision as whether they will present an article will be made by the attending on service. A schedule is posted on the Infectious Diseases office bulletin board and copies are available from the Infectious Diseases ~~administrative assistant~~Program Coordinator. Each Internal Medicine specialty resident and student will be expected to present one time during the rotation. Assignments will be made by the fellow or attending. Fellows are assigned to a specific group according to the master schedule. The quality of presentations will be considered in the evaluation of ID fellows, specialty residents, and students.

12. Fellows, specialty residents and students are invited to attend the Infectious Diseases Research Conference on ~~each~~ select Wednesdays at 8:00 am and the Internal Medicine Grand Rounds each Friday at 7:30 am. Fellows will be required to present at Research Conference during year two, and in year three when applicable.

13. The ID clinical conferences will be held on select Monday mornings at 8 am. ~~every other week on select Fridays at 11 am 8:00am at Saint Louis University.~~ Fellows, specialty residents, and students will attend these conferences and will present and discuss cases and selected topics in infectious diseases. A review of the literature relevant to the case is required of the fellow. The quality of these presentations will be considered in the evaluation of students, specialty residents, and fellows.

14. Immunology Review Conference will be held ~~every other week~~ on select ~~Fridays at 11~~ Wednesdays at 8am.

15. Infectious Diseases Clinics are to be attended by the fellow. They will be supervised by the scheduled faculty member. Specialty residents and students will cover the clinical service with the attending during clinic hours. The Infectious Diseases Clinic is held Tuesday and Thursday from 8:30am to 12:00pm at the New Hope Clinic.

16. Specialty residents must attend their general medicine clinics during the month on Infectious Diseases rotation. It is the responsibility of the resident to round on their ID patients and present to the attending prior to leaving for clinic.

17. The fellow, specialty resident, or student is responsible for managing coverage any time for which s/he is not available. In order to provide appropriate coverage, any requests should be made as early as possible. Arrangements also must be made with the team so that someone is responsible for the care of patients in the absence of the fellow, specialty resident, or student. Appropriate clinical information must be communicated to the individual providing coverage when an individual is unable to meet their responsibilities.

18. It is recommended that generic names be used whenever possible instead of trade names when discussing medications, especially antibiotics (e.g. ceftazidime instead of Fortaz).

19. The specialty residents and students will have a formal didactic lecture series each rotation. Attendance is required at all sessions. Teaching is done by the attending and fellows in the Infectious Diseases Division. Fellows are expected to attend at least one full lecture series at the beginning of their first year. (The lecture topics are at the end of this section.)

20. The Infectious Disease fellows, Internal Medicine specialty residents, and medical students on the inpatient service are required to attend the Clinical Microbiology Conference and Journal clubs on select Mondays and Wednesdays each month, at 8:00am. A schedule is posted on the Infectious Diseases office bulletin board and copies are available from the Infectious Diseases Program Coordinator.

21. Consults will be assigned by the fellow to specialty residents and students on a rotational basis. The complexity of the patients' work-up and care will be taken into consideration as will the number of patients assigned to an individual. Each member of the team should try to manage a variety of patients to provide for a wider background in the types and presentations of infectious diseases.

Lecture Topics:

- **Antibiotics**
- **Viruses and Antiviral Agents**
- **Fungi and Antifungal Agents**
- **Meningitis and Brain Abscess**
- **Pneumonia**
- **Endocarditis**
- **Hepatitis**
- **Skin and soft Tissue Infections**
- **STDs**
- **HIV**
- **TB and Mycobacteria other than MTB**
- **Rickettsia**
- **Parasites and Malaria**
- **Infection Control**

Weekly
Infectious Diseases Schedule

<table>
<tr><th></th><th>Monday</th><th>Tuesday</th><th>Wednesday</th><th>Thursday</th><th>Friday</th></tr>
<tr><td>7:30am</td><td></td><td></td><td></td><td></td><td rowspan="2">IM Grand Rounds
(LRC Aud A)</td></tr>
<tr><td>8:00am</td><td rowspan="3">Current Topics (Journal Club)
or
Clinical <s>Microbiology</s> Conference</td><td></td><td rowspan="2">Research Conference/Microbiology Conference/Immunology Review
(DRC-8 Conf Rm)</td><td rowspan="2">Infection Control Mtg 2nd Thurs, 8-9am
(Medical Staff Lounge)</td></tr>
<tr><td>8:30am</td><td rowspan="5">ID Clinic
(Drummond Hall Suite 100)</td><td rowspan="3"></td></tr>
<tr><td>9:00am</td><td></td><td rowspan="4">ID Clinic
(Drummond Hall Suite 100)</td></tr>
<tr><td>10:00am</td><td></td><td></td></tr>
<tr><td>11:00am</td><td></td><td></td><td rowspan="2"><s>Clinical Conference or Immunology Review (DRC 8th Floor)</s></td></tr>
<tr><td>12:00noon</td><td></td><td>Fellows' Conference
(Drummond Hall Suite 100)</td></tr>
<tr><td>Afternoon</td><td>Attending Rounds</td><td>Attending Rounds</td><td>Attending Rounds</td><td>Attending Rounds</td><td>Attending Rounds</td></tr>
</table>

Curriculum Description

The purpose of these block diagrams is to give the Residency Review Committee an overview of what takes place during each year of training. This is not the order of fellows' schedule but merely a way to show what fellows do on average each year.

Location key: SSM SLU Hospital = 1; SSM Cardinal Glennon Children's Hospital = 2; St. Louis Veterans Hospital = 3.

Block Diagram For First Year

Months	1	2	3	4	5	6	7	8	9	10	11	12	13
Name of experience or rotation	Clinical Micro	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Infection Control	Elective	Elective	Elective
Required or Elective	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**E**	**E**	**E**
Location (Hospital)	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**3**	**1**	**1**	**1**
Frequency (#days per week)	**5**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**5**	**5**	**5**	**5**
Ambulatory Clinic	½ day per week (location = 1); HCV clinic ½ day per week on elective (location = 3)												

Block Diagram For Second Year

Months	1	2	3	4	5	6	7	8	9	10	11	12	12
Name of experience or rotation	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Pediatrics	Antimicrob Stewardshp	Elective	Elective	Elective	Elective	Elective	Elective
Required or Elective	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**E**	**E**	**E**	**E**	**E**	**E**
Location (Hospital)	**1**	**1**	**1**	**1**	**1**	**2**	**3**	**1**	**1**	**1**	**1**	**1**	**1**
Frequency (# days per week)	**6**	**6**	**6**	**6**	**6**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Ambulatory Clinic	½ day per week (location = 1); HCV clinic ½ day per week on elective (location = 3)												

Block Diagram for Third Year (If Applicable)

Months	1	2	3	4	5	6	7	8	9	10	11	12	13
Name of experience or rotation	Inpatient Consult	Elective	Elective	Elective	Elective	Elective	Elective	Elective	Elective	Elective	Elective	Elective	Elective
Required or Elective	**R**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**
Location (Hospital)	**1**	**1**	**1**	**1**	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Frequency (# days per week)	**6**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**

Optional Programs

In addition to the two-year program (clinical track), additional pathways, clinical investigator track and basic research track are also available.

The basic requirements of these pathways are the same as two-year programs. In year 3 and year 4, the majority of the time is devoted to research but optional one-month in each year on the clinical service will be available. The detailed time allotment of year 3 and year 4 will depend on the individual mentor and research project.

Program Schedule

Rotation	**Clinical Track 2 years**	**Clinical Investigator Track 3 years**	**Basic Research Track 4 years**
Consultation Service	13 blocks	13 blocks	13 blocks
Pediatric ID	1 block	1 block	1 block
Infectious Disease Clinic	½ day per week	½ day per week	½ day per week
Clinical Microbiology	1 block	1 block	1 block
Elective	9 blocks	21 blocks	33 blocks
Infection Control	1 block	1 block	1 block
Antimicrobial Stewardship	1 block	1 block	1 block

Infectious Diseases Fellows Rotation at Saint Louis University Hospital

The Infectious Diseases Fellow is required to be trained in all aspects of the subspecialty of Infectious Diseases. The fellow is required to spend thirteen blocks on the Saint Louis University Hospital inpatient consultation service. Saint Louis University Hospital is an adult hospital providing general medical and surgical care as well as tertiary referral care [Level 1 trauma, orthopedics, solid organ transplantation, hematology-oncology and Hematopoietic Stem Cell (HSC) transplantation]. The fellow will be an integral member of the inpatient consultation team (attending physician, fellow, Internal Medicine resident and medical students). The fellow is directly supervised by the attending physician faculty member on all aspects of clinical care and performance. Attending physicians rotate on a two week basis and the fellows are scheduled for 8 blocks in their first year of training (PGY-4) and 5 blocks in their second year of training (PGY-5). Progressive development of clinical expertise and increasing graded responsibility for patient care over the first year period is provided under the direct supervision of the attending physician. Approximately 400 inpatient consultations are performed by each fellow with over 100 (25%) consultations in immune suppressed patients.

The hospital is physically located one block from the Infectious Diseases Division office and one block from the outpatient offices of the Division of Infectious Diseases (New Hope Clinic). The inpatient consultation experience includes consultation on every inpatient service as well as direct care responsibility for active outpatients of the Infectious Diseases Service (New Hope Clinic) who are admitted to Saint Louis University Hospital. This experience provides the trainee the opportunity to develop expertise in the continuous clinical care of these patients.

Educational activities and teaching methods of the program include textbook reading, conferences (Journal Club, Clinical Conference, Research Conference, Fellows Core Didactic Conferences, Immunology Review Conference, and Internal Medicine Grand Rounds), web based information, small group discussions, literature review, and review of microbiology laboratory and pathology data. Progressive independence and responsibility are expected and required as the fellow improves their overall clinical skills.

Goals and Objectives

The overall goal of the inpatient experience is to educate the trainee in the diagnosis and management of routine and complex adult infectious diseases and prepare them for a career as an Infectious Disease Subspecialist certified by the American Board of Internal Medicine. An additional goal is to gradually and progressively increase responsibility and decision making for the fellow in order to prepare them to be qualified for independent management of inpatient infectious diseases.

Specific Goals

1. Patient Care

- Be capable of accurate, comprehensive patient evaluations, including history, physical examination and data review. Fellows will also become progressively independent in the formulation of the differential, work-up and treatment plans.
- Ensure that clinical decisions are made on available evidence, sound judgment, and individual patient factors

2. Medical Knowledge

- Acquire an advanced understanding of host defense mechanisms and immune responses to infectious agents
- Acquire an advanced understanding of the etiology, pathogenesis, diagnosis and therapy of patients with infectious diseases
- Acquire an advanced understanding of infections in immunosuppressed hosts
- Acquire advanced expertise in anti-infective therapy including mechanism of action, resistance mechanisms, pharmacokinetics and pharmacodynamics

3. Practice Based Learning and Improvement

- Develop skills in problem based learning and improvement
- Effectively utilize feedback to improve patient care and decision making
- Demonstrate progressive improvement in performance based on review of practice pattern
- Incorporate new practice information and recommendations to guide improvement of clinical care

4. Intrapersonal and Communication Skills

- Demonstrate accurate and concise communication with patients, family, attending physicians, and hospital personnel
- Demonstrate prompt and appropriate communication with home care and clinic personnel for outpatient follow-up, including accurate documentation in the medical record
- Demonstrate the ability to work with the entire inpatient care team (attending physician, post-graduate physicians, medical students, hospital personnel, and home care coordinators)

5. Professionalism

- Develop and maintain appropriate levels of ethical, moral, and professional behavior
- Demonstrate appropriate respect and behavior to all patients and families
- Demonstrate a commitment to ethical principles pertaining to confidentiality

6. Systems Based Practice

- Acquire expertise in systems based practice
- Interact effectively with patient, family, pharmacy, case managers, and home care personnel in arranging outpatient intravenous antimicrobial therapy
- Interact effectively with patients, case managers, pharmacy, social work personnel, and clinic staff in the care of patients with HIV

Teaching Methods

- Text book reading
- Small group discussions
- Web based information
- Review of current literature
- Journal Club
- Clinical Conference
- Research Conference
- Fellows Didactic Conference
- Immunology Review conference
- Internal Medicine Grand Rounds

Mix of Diseases

The major diseases evaluated at Saint Louis University Hospital are both routine and complex medical and surgical infections. A significant portion of patients are immune suppressed and therefore have a wide range of unusual secondary infections. As a Level 1 Trauma and Tertiary Referral Center, Saint Louis University Hospital provides care for severe and complex primary infections and secondary infection complications.

Evaluation

The fellow is evaluated on a monthly basis for the core competencies by the attending who is directly responsible for the care and management of these patients. These evaluations are submitted to the Program Director and represent the major portion of the subspecialties evaluation for overall clinical competencies. Any deficiencies are immediately reported to the Program Director for individual management or referral to the Clinical Competency Committee.

Infectious Diseases Fellows Experience in the New Hope Clinic

The Infectious Diseases Fellow is required to be trained in the outpatient management of infectious diseases including the continuous care of patients infected with HIV. This training consists of ½ day per week at the New Hope Clinic for a 3½ hour session. This time period provides for a maximum of 7 follow-up visits per session of ½ hour per visit or a reduced number of follow-up visits with a full hour for new patient visits. The clinic is physically located one block from the Infectious Diseases offices and one block from both Saint Louis University Hospital and Cardinal Glennon Children's Hospital.

The fellows are supervised by a faculty member who is on site for the entire time period at the clinic (8:30am – 12:00 noon). The primary faculty member is Board Certified in Infectious Diseases and has greater than 20 years experience in HIV care and management. The experience consists of new patient evaluations (both HIV infection and other referrals), follow-up visits (both HIV care and other referrals), and follow-up visits for hospitalized patients previously seen by the fellows (primarily patients receiving outpatient intravenous antimicrobial agents).

The clinic has support from a dedicated administrative assistant, dedicated registered nurse, case managers for HIV care, and pharmacy personnel. Educational activities include textbook reading, web-based information, and small group discussions. Twenty-four months of continuity of care for HIV is provided for approximately 50 individuals with HIV per fellow. Progressive independence and responsibility are expected and required as the fellow improves their overall clinical skills.

Goals and Objectives

The overall goal of the experience in the New Hope Clinic is to educate the trainee in outpatient management of both HIV infection and its complications, outpatient intravenous antibiotic administration, and other consultative ambulatory infectious diseases. An additional goal is to gradually and progressively increase responsibility and decision making for the fellow in order to prepare them to be qualified for independent management of outpatient infectious diseases, especially HIV care.

1. Patient Care

- Be capable of accurate, comprehensive patient evaluations, including history, physical examination, and data review.
- Formulate care plans for patients various infectious disease problems
- Insure that clinical decisions are made on available evidence, sound judgment, and individual patient factors
- Follow up labs and other after-hour requests, such as medication refills, in a timely manner and with supervision from the attending.

2. Medical Knowledge

- Understand the natural history, diagnosis, and management of HIV infection
- Understand the natural history, diagnosis and management of secondary opportunistic infections and malignancies associated with HIV infection
- Understand the drug therapy, toxicities, and monitoring of HIV infected patients
- Understand the role of resistance testing and management strategies for patients with HIV

- Be knowledgeable in the guidelines for the administration and monitoring of outpatient antimicrobial therapy
- Be knowledgeable in the management of other outpatient infectious diseases

3. Practice Based Learning and Development

- Demonstrate progressive improvement in performance based on review of practice patterns
- Effectively utilizes feedback to improve patient care and decision making
- Incorporates new practice information to guide improvement of clinical care

4. Intrapersonal and Communication Skills

- Demonstrate accurate and concise communication with patients, family, attending physicians, and clinic personnel
- Demonstrate prompt and appropriate communication with home care follow-up for patients on outpatient intravenous antimicrobials
- Demonstrate the ability to work with the entire care team (attending physician, clinic nurse, administrative assistant, case managers, pharmacy and home care coordinators)

5. Professionalism

- Demonstrate appropriate respect and behavior to all patients and families
- Demonstrate a commitment to ethical principles pertaining to confidentiality

6. Systems Based Practice

- Interact effectively with the patients, pharmacy, case managers, social work personnel in the care of patients with HIV
- Interact effectively with patients, family, pharmacy and home care coordinators in patients on home intravenous antimicrobial therapy

Teaching Methods

- Textbook reading
- Small group discussion
- Web-based information
- Review of current literature
- Didactic conferences

Mix of Diseases

The major diseases managed at the new Hope Clinic are HIV and conditions that require long-term outpatient intravenous antimicrobial therapy (such as osteomyelitis, infective endocarditis, suppurative arthritis, liver abscesses, selected pneumonias, and fungal infections). In addition, a variety of other complex infectious diseases is seen and evaluated (tuberculosis, fever of unknown origin, fungal infections, travel medicine, sexually transmitted diseases, and complicated skin and soft tissue).

Female patients with HIV who are pregnant are regularly evaluated and managed in conjunction with the Saint Louis University High-Risk Obstetrical Clinic at St. Mary's Hospital.

Evaluation

The fellow is evaluated for the core competencies by the clinic attending who is directly responsible for the care and management of these patients on an ongoing and continuous basis. These evaluations are performed at six month intervals over the 24 month experience. In addition, evaluations are performed by the clinic nurse and administrative assistant in selected core competencies.

Infectious Diseases Fellows Experience in Hepatitis C Clinic

The Infectious Diseases Fellow will benefit from being trained in the outpatient management of Hepatitis C Virus. This training consists of ½ day per week at the St. Louis Veterans Hospital for a 3½ hour session. The clinic is physically located 1.9 miles from the SSM SLU Hospital, directly north on Grand Blvd.

The fellows are supervised by a faculty member who is on site for the entire time period at the clinic (8:00am – 11:30am). The primary faculty member is Board Certified in Hepatology and has experience in advanced liver disease as well as HCV care and management. The experience consists of new patient evaluations and, follow-up visits (both HCV care and cirrhosis management).

The clinic has support from a dedicated administrative assistant, physician assistants, and a pharmacist who are all physically in the clinic during the time listed. Educational activities include textbook reading, web-based information, and small group discussions. Progressive independence and responsibility are expected and required as the fellow improves their overall clinical skills.

Goals and Objectives

The overall goal of the experience in the VA's Hepatitis C Clinic is to educate the trainee in management of Hepatitis C infection and its complications. An additional goal is to gradually and progressively increase responsibility and decision making for the fellow in order to prepare them to be qualified for independent management of Hepatitis C.

1. **Patient Care**
    - Be capable of accurate, comprehensive patient evaluations, including history, physical examination, and data review
    - Formulate care plans for patients with regard to work up and treatment
    - Insure that clinical decisions are made on available evidence, sound judgment, and individual patient factors

2. **Medical Knowledge**
    - Understand the natural history, diagnosis, and management of HCV infection
    - Understand the natural history, diagnosis and management of cirrhosis and malignancies associated with HCV infection
    - Understand the drug therapy, toxicities, and monitoring of HCV infected patients
    - Understand the role of resistance testing and management strategies for patients with HCV

3. **Practice Based Learning and Development**
    - Demonstrate progressive improvement in performance based on review of practice patterns
    - Effectively utilizes feedback to improve patient care and decision making
    - Incorporates new practice information to guide improvement of clinical care

4. Intrapersonal and Communication Skills

- Demonstrate accurate and concise communication with patients, family, attending physicians, and clinic personnel
- Demonstrate prompt and appropriate communication with pharmacists regarding medication interactions and duration of therapy
- Demonstrate the ability to work with the entire care team (attending physician, allied health professionals, clinic nurse, administrative assistant, case managers, and pharmacy)

5. Professionalism

- Demonstrate appropriate respect and behavior to all patients and families
- Demonstrate a commitment to ethical principles pertaining to confidentiality

6. Systems Based Practice

- Interact effectively with the patients, pharmacy, and other healthcare workers in the care of patients with HCV

Teaching Methods

- Textbook reading
- Small group discussion
- Web-based information
- Review of current literature

Evaluation

The fellow is evaluated for the core competencies by the clinic attending who is directly responsible for the care and management of these patients on an ongoing and continuous basis. These evaluations are performed at six month intervals over the 24 month experience.

Infectious Disease Fellows Rotation in Infection Control

The Infectious Disease Fellow is required to be trained in the fundamentals of infection control, hospital epidemiology, and the requirements of public health reporting of reportable diseases and conditions. This training consists of a four week rotation in the Infection Control Program at the St. Louis Veterans Administration Hospital, under the direct supervision of the Infection Control Officer who is a board certified internist and infectious diseases specialist with experience directing the Infection Control Program at the St. Louis Veterans Administration Hospital.

This experience consists of active participation in the Infection Control activities (surveillance review with the Infection Control practitioners, data review and analysis, policy and procedure review, meeting attendance) as well as educational activities through textbook reading and small group discussions.

Goals and Objectives
The overall goal of the rotation in Infection Control is to educate the trainee in the basics of infection control and prepare the trainee for additional responsibilities as an Infection Control Officer.

1. **Patient Care**
    - There are no direct patient care responsibilities on the Infection Control Rotation
2. **Medical Knowledge**
    - To understand the definitions and criteria for nosocomial infections for surveillance and reporting purposes
    - Understand the major variables for isolation practices, the diseases for which they apply, and the criteria for their discontinuation
    - Be familiar with the diseases and conditions that are reportable to local, state, and national public health agencies and the mechanisms and details of these reports
    - Understand the basic principles and definitions in epidemiology and outbreak recognition and investigation
    - Understand the impact of the environment as it relates to nosocomial infections, especially in the immunosuppressed host
    - Be familiar with the policies and procedures instituted to reduce the incidence and severity of nosocomial infections
    - Be familiar with the policies and procedures that are related to disinfection and sterilization designed to reduce the incidence of nosocomial infections
    - Understand the relationship of Infection Control activities to Medical Staff activities (credentialing process and peer review) and to the requirements of Joint commission
3. **Practice Based Learning and Improvement**
    - Understand the limitations of knowledge and develop methods to learn and improve on a self-directed basis
    - Utilize resources to incorporate up-to-date literature for infection control issues

4. Interpersonal and Communication Skills

- Demonstrate accurate and concise communication with the Infection Control officer, Infection Control practitioner, and members of the medical staff.

5. Professionalism

- Demonstrate appropriate respect and behavior to all members of the health care team
- Demonstrate a commitment to ethical principles pertaining to confidentiality

6. System Based Practice

- Interact effectively with the Infection Control practitioner, medical staff, and public health department
- Integrate information from surveillance data, microbiology, pathology, and pharmacy to ensure quality patient care and appropriate recommendations

Teaching Methods

- Textbook reading
- Small group discussion
- Web based information
- Review of current literature

Mix of Diseases

The major nosocomial infections (pneumonia, urinary tract, surgical site, catheter related, and *C. difficile*) are reviewed with emphasis on diagnostic criteria, reporting, and interpretation of rates compared to both internal and external benchmarks. The textbook *Hospital Epidemiology and Infection Control, Fourth Edition* by Mayhall is utilized as the major reference with supplements from both the IDSA (http://www.idsociety.org/) and SHEA (http://www.shea-online.org/) websites. Particular emphasis is devoted to the prevention and management of vascular catheter infections as delineated by the guidelines on the IDSA website.

Evaluation

The fellow is evaluated for the core competencies by the Infection Control Officer at the midpoint and conclusion of the experience. The interaction with the Infection Control practitioner, the Infection Control Officer, and administrative staff of the hospital are utilized with the evaluation process. The fellow is directly supervised by the Infection Control Officer during this experience.

Infectious Diseases Fellows Rotation in Pediatrics at Cardinal Glennon Children's Hospital

The Infectious Diseases fellow is required to be familiar with infectious diseases in the pediatric population. The fellow is required to spend a four week rotation on the SSM Cardinal Glennon Children's Hospital inpatient consultation service. Cardinal Glennon Children's Hospital is a full service pediatric hospital providing general medical and surgical care as well as tertiary referral care (level 1 trauma, orthopedics, solid organ transplantation, hematology-oncology and bone marrow transplantation). The fellow will be an integral member of the inpatient consultation team (attending physician, fellow, pediatric resident, and medical students). The fellow is directly supervised by the attending physician faculty member in all aspects of clinical care and performance. Attending physicians rotate on a one month basis. The infectious disease fellows are scheduled for this experience in the second half of their first year of training (PGY-4) or in their second year of training (PGY-5). The hospital is physically one block from Saint Louis University Hospital and two blocks from the Infectious Diseases offices and the outpatient offices of the Division of Infectious Diseases (New Hope Clinic). The inpatient consultation experience includes consultation on every inpatient service. Educational activities and teaching methods include textbook reading, conferences (Journal Club, Clinical Conference, Research Conference, Fellows Core Didactic Conference, Immunology Review Conference, and Internal Medicine Grand Rounds), web based information, small group discussion, literature review, and review of laboratory and pathology data.

Progressive independence and responsibility are expected and required as the fellow improves their overall skills.

Goals and Objectives

The overall goal of the experience is to familiarize the adult fellow in infectious disease in aspects of the diagnosis of common and complex pediatric infectious diseases. This would include the recognition of clinical differences in diseases in the pediatric population compared to adults, including the necessity of proper dosing of antimicrobial agents.

Specific Goals

1. **Patient Care**
    - Be capable of accurate, comprehensive patient evaluation, including history, physical examination and data review
    - Ensure that clinical decisions are made on available evidence, sound judgment and individual patient factors

2. **Medical Knowledge**
    - Acquire basic understanding of the etiology, pathogenesis, diagnosis and therapy of pediatric patients with infectious diseases
    - Require a basic understanding of host defenses and immune responses to infectious agents in pediatric patients
    - Be familiar with the use and dosing recommendations of anti-infective drugs in the pediatric patient

- Be familiar with pediatric immunosuppressed conditions

3. Practice Based Learning and Improvement

- Effectively utilize feedback to improve patient care and decision making
- Incorporate new practice information and recommendations to guide improvement of clinical care
- Demonstrate progressive improvement in performance based on review of practice patterns

4. Interpersonal and Communication Skills

- Demonstrate accurate and concise communication with patients, family, attending physician, and hospital personnel
- Demonstrate the ability to work with the entire inpatient care team (attending physician, post-graduate physician, medical students, hospital personnel, and home care coordinator)

5. Professionalism

- Demonstrate appropriate respect and behavior to all patients and families
- Demonstrate a commitment to ethical principles pertaining to confidentiality

6. Systems Based Practice

- Interact effectively with patients, family, pharmacy, home care personnel with outpatient care and follow-up of pediatric patients
- Interact effectively in providing pediatric patients with appropriate ancillary personnel including support services and social work

Teaching Methods

- Textbook reading
- Small group discussions
- Web based information
- Review of current literature
- Journal Club
- Clinical Conference
- Research Conference
- Fellow didactic conferences
- Immunology Review Conference

Mix of Diseases

The major diseases evaluated at Cardinal Glennon Children's Hospital include both routine and complex medical and surgical infections. A significant portion of these pediatric patients are immunosuppressed and therefore have a wide range of unusual secondary infections. As a Level 1 pediatric trauma and tertiary referral center, Cardinal Glennon Children's Hospital provides care for severe and complex primary infections and secondary infection complications.

Evaluation

The fellow is evaluated for the core competencies by the pediatric infectious diseases attending physician who is directly responsible for the care and management of the patients. These evaluations are submitted to the Program Director and incorporated in the overall evaluation of the fellow's performance. Any deficiencies are immediately reported to the Program Director for individual management or referred to the Fellows Evaluation committee (faculty).

Infectious Diseases Fellows Rotation in the Clinical Microbiology Laboratory

The Infectious Diseases Fellow is required to be trained in the fundamentals of diagnostic clinical microbiology and virology. This training consists of a four week rotation at Saint Louis University Hospital Diagnostic Clinical Microbiology Laboratory. The Director is a full time faculty member in the Department of Pathology at Saint Louis University, has been recently trained and has over 5 years of experience in diagnostic microbiology and virology. The experience consists of active participation in the laboratory diagnosis of bacterial, mycobacterial, fungal, parasite, and viral infections and educational activities through textbook reading and small group discussions.

Goals and Objectives

The overall goal of the rotation in clinical microbiology and virology is to educate the trainee in the basic methodology of the laboratory diagnosis of infectious disease and prepare the trainee for the use of the diagnostic laboratory in patient care activities.

Specific Goals

1. Patient Care

- Correlate diagnostic laboratory testing with clinical exam, history, and other laboratory findings
- Appropriate and complete review of medical records, laboratory reports, and clinical findings

2. Medical Knowledge

- Understand the principles of media selection, plating and culture examination of bacterial, mycobacterial, fungal and viral cultures
- Understand susceptibility testing of bacteria
- Understand the preparation and interpretation of stains for microscope examination of specimens
- Gain experience in microscope identification of parasites and ova
- Understand principles of nucleic acid testing and their application to diagnostic microbiology and virology
- Understand basic serologic and antigen selection diagnostic methods

3. Practice Based Learning and Improvement

- Understand the limitation of diagnostic testing and learn to improve on a self-directed basis
- Utilize resources to incorporate new literature for laboratory diagnosis of infectious diseases
- Understand quality assurance and quality control in the diagnostic laboratory

4. Interpersonal and Communication Skills

- Learn proper laboratory procedures for communicating results to clinicians, Infection control personnel, and agencies that monitor reportable diseases
- Develop relationship building with members of the laboratory diagnostic team

5. Professionalism

- Demonstrate appropriate respect and behavior to all members of the laboratory diagnostic team
- Demonstrate a commitment to ethical behavior, especially confidentiality
- Understand laboratory safety and inactivation of infectious agents

6. Systems-Based Practice

- Understand the entire system of collection, transport, processing, reporting of specimens in the diagnostic microbiology and virology laboratories
- Understand algorithms for reporting results, including standard incubation times, specimen identification, and antimicrobial susceptibility

Teaching Methods

- Textbook reading
- Small group discussion
- Web-based information
- Review of current literature
- Hands on activity for culture, susceptibility, and diagnostic stains

Mix of Diseases

Saint Louis University Hospital Diagnostic Microbiology Laboratory and Cardinal Glennon Children's Hospital Diagnostic Laboratory are both laboratories in tertiary care hospitals with a complex patient mix (level 1 trauma, transplantation, HIV, hematology-oncology service) as well as regional referral facilities for multiple other hospitals and clinics. The volume and complexity of this patient population provides for an extensive experience in diagnostic microbiology.

Evaluation

The fellow is evaluated for the core competencies by the Director of the Diagnostic Microbiology Laboratory at the midpoint and conclusion of the experience. The fellow's interaction with the laboratory supervisor, medical technicians, and ancillary personnel are utilized in this evaluation. The Program Director and Director of the Diagnostic Microbiology Laboratory have a close working relationship through their combined participation in educational activities, clinical practice, and hospital Infection Control activities.

Infectious Diseases Fellows Rotation in Antimicrobial Stewardship

The Infectious Diseases Fellow is required to be trained in the fundamentals of antimicrobial stewardship. This training consists of a four week rotation at the St. Louis Veterans Administration Hospital. The Director is a full time faculty member at Washington University in the Department of Infectious Diseases, and there is a full time infectious-diseases-trained pharmacist who implements the daily nuances of the ASP. The experience consists of active participation in the ASP as well as educational activities through textbook reading and small group discussions with the director and pharmacist. Each fellow will participate in a small quality improvement project on which the ASP is working.

Goals and Objectives

The overall goal of the rotation in antimicrobial stewardship is to educate the trainee in the function of an ASP within a hospital system. Areas of focus will include the selection, dosing, route and duration of antimicrobial therapy, and evaluating the unintended consequences of antimicrobials, such as the development of resistance, adverse drug events and costs.

Specific Goals

1. Patient Care

- Correlate antimicrobial choice with clinical exam, history, and other laboratory findings
- Appropriate and complete review of medical records, laboratory reports, and clinical findings

2. Medical Knowledge

- Understand the principles of antibiotic selection including dosing, route and duration
- Understand susceptibility testing of bacteria
- Gain experience applying formulary restrictions with the confines of real patient care
- Understand when de-escalation of antimicrobials, including route of administration, is appropriate

3. Practice Based Learning and Improvement

- Utilize resources to incorporate new literature for the treatment of infectious diseases
- Effectively utilize feedback to improve patient care and decision making
- Demonstrate progressive improvement in performance based on review of practice patterns

4. Interpersonal and Communication Skills

- Demonstrate the ability to work with the entire inpatient care team when making recommendations
- Develop relationship building with members of the pharmacy and microbiology teams

5. Professionalism

- Demonstrate appropriate respect and behavior to all members of the antimicrobial stewardship program
- Demonstrate a commitment to ethical behavior, especially confidentiality

6. Systems-Based Practice

- Interact effectively with the ID pharmacist and hospital service teams
- Integrate information from microbiology, pathology, and pharmacy to ensure quality patient care and appropriate recommendations

Teaching Methods

- Textbook reading
- Small group discussion
- Web-based information
- Review of current literature

Mix of Diseases

The St. Louis Veterans Administration Hospital has a diverse patient mix (surgery services, HIV, hematology-oncology service) as well as regional referral facilities for multiple other VA hospitals and clinics. The volume and diversity of this patient population, along with the long-standing nature of this particular ASP provides for an extensive experience in antimicrobial stewardship.

Evaluation

The fellow is evaluated for the core competencies by the Director of the ASP at the conclusion of the experience. Feedback should be given at the midpoint, and the fellow is encouraged to seek feedback if it's not offered. The fellow's interaction with the Director, the ID pharmacist and other members of the ASP are utilized in this evaluation.

Curriculum Review Articles (with links to web pages)

Websites for General Infectious Diseases:

- **IDSA (http://www.idsociety.org/)**
-

Websites for Infection Control:

- **IDSA (http://www.idsociety.org/)**
- **SHEA (http://www.shea-online.org/)**

Websites for HIV treatment guidelines and for STD treatment:

http://aidsinfo.nih.gov/guidelines/:

- **Antiretroviral Treatment**
- **Adult and Adolescent Guidelines**
- **Pediatric Guidelines**
- **Maternal-Child Transmission**
- **Perinatal Guidelines**
- **Post-Exposure Prophylaxis**
- **Health-Care Worker Exposure Guidelines**
- **Nonoccupational Exposure Considerations**
- **Management of HIV Complications**
- **Prevention and Treatment of Opportunistic Infections Guidelines**
- **Incorporation of HIV Prevention**
- **Testing**
- **Revised Guidelines for Counseling, Testing, and Referral**

http://cdc.gov/std/treatment:

- **STD treatment guidelines**