Infectious Diseases

Curriculum/Syllabus

Revised 2013

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Overview of Infectious Diseases Training Program
Internal Medicine Infectious Diseases Subspecialty 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 subspecialty residents. 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 subspecialty resident 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.

A. Goals of the Clinical Infectious Diseases Trainee Program

- to prepare subspecialty residents (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 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 subspecialty resident 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. eye infections
4. upper respiratory tract infections
5. lower respiratory tract infections
6. urinary tract infections
7. intra-abdominal infections
8. infective endocarditis and intravascular infections
9. central nervous system infections
10. gastrointestinal infections
11. bone and joint infections
12. sexually transmitted diseases and diseases of the reproductive tract
13. HIV/AIDS
14. hepatitis
15. skin and soft tissue infections
16. 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 including the management and maintenance of indwelling vascular catheters
- acquire an advanced understanding of infections in special hosts (transplant recipients, 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 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 13 faculty members with a wide variety of clinical and research interests. In addition, the Infectious Diseases subspecialty residents 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 subspecialty residents. 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 subspecialty residents 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 to the supervising subspecialty trainee by a faculty member. The assigned subspecialty resident 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 subspecialty trainee 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 subspecialty resident or Internal Medicine resident and supervised by the attending physician. Rounds are conducted with the attending physician on a daily basis on all patients referred to the Infectious Diseases Service.

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

Subspecialty residents and Internal Medicine residents are required to attend the weekly Clinical Case Conference, Current Topics in Infectious Diseases Conference, Infectious Diseases Research Conference, Review of Immunology Conference, and Clinical Microbiology Conference. In addition, the subspecialty residents are required to attend a designated subspecialty didactic conference. The subspecialty resident or 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 subspecialty resident is responsible for the review, presentation and discussion of articles from the recent literature at the Current Topics in Infectious Diseases Conference and Immunology Review Conference. The subspecialty resident is also responsible for 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 month 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 • Discussions on attending rounds
• 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 subspecialty resident selects a faculty member in conjunction with the Division Director to directly supervise the research training. The faculty member and subspecialty resident work together in an apprenticeship method in the design, approval, implementation, data analysis, and presentation of the research project. Methods utilized include library assignments, seminars, and informal discussions. The research is presented by the subspecialty resident at the Infectious Diseases Research Conference with review and criticism by the Infectious Diseases faculty. An abstract and manuscript are authored by the subspecialty resident under the supervision of the assigned faculty member.

Goals and Objectives for Research During Infectious Disease Training

Goals

1. Subspecialty residents 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. The skills necessary for the achievement of these goals will particularly be developed in subspecialty residents who participate in additional training, although those trainees participating for the two year fellowship will also 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 the methods of developing a research plan. This includes assessment of the necessary groups of patients needed in a clinical trial to determine for instance, efficacy of vaccination or treatment. In the case of laboratory research this would include determination of groups of animals or *in vitro* laboratory tests needed to explore the validity of a primary hypotheses.

3. Acquisition of skills necessary to carry out the methods of procedure listed in 2. These would include the ability to formulate the hypothesis and methods of procedure in an understandable format in writing, understanding of procedures for obtaining institutional approval of proposed projects including human and animal studies committees and other research related committee approvals, acquisition of laboratory skills to carry out planned laboratory assays which would include the mechanics of actually performing the assays, and learning by practical experience and thereby placing all the above in a format acceptable for grant applications.

4. Initiation and implementation of the planned research activity.

5. Analysis of data generated, including either clinical or laboratory data. Use of methods in data reduction including computerized programs, application of statistical methods in analyzing the data, and understanding tabular and illustrative graphs to present the data in an understandable fashion.

6. Formulation of the analyzed data into abstract format and formats for eventual presentation in oral or poster sessions at appropriate scientific meetings, and formulating the research study results into the format required for a scientific paper for submission to a peer-review journal.

V. Evaluations

A. Clinical Infectious Diseases Training

The supervising faculty member is directly responsible for the evaluation of the subspecialty resident on the Clinical Infectious Diseases Service. Additional input can be obtained from other faculty members who have observed the performance of the subspecialty resident. Evaluations are performed monthly on the inpatient rotation and every six months in the clinic experience. If deficiencies in the subspecialty residents 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 for Infectious Diseases. Each subspecialty resident'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 Committee for Infectious Diseases consists of the full-time faculty and is chaired by the Program Director. The committee will evaluate each subspecialty resident's performance at least on an annual basis.

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

The faculty on the Clinical Infectious Diseases Service will be evaluated with a written evaluation by each subspecialty resident annually. 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 subspecialty resident's performance is provided to the Program Director of Infectious Diseases.

Subspecialty Program In Infectious Diseases

I. 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 subspecialty residents are drawn from these institutions.

The subspecialty resident serves as a consultant on seven to ten new consults per week and is responsible for the follow-up visits, and has direct responsibility for Infectious Diseases Clinic patients who are hospitalized. The average number of new consultation 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. More than one fourth of these consultations are in immune compromised hosts.

The subspecialty resident is not directly responsible for the inpatient management of infectious disease problems but serves as a consultant at the institutions listed above. The subspecialty resident rotates at one institution at a time. For one month of the first or second year, the Infectious Disease subspecialty resident rotates on the Cardinal Glennon Children's Hospital Infectious Diseases Service.

The subspecialty resident is not expected to write orders on the charts of these patients; this is the responsibility of the internal medicine or pediatric resident on the inpatient services. 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 subspecialty resident's Infectious Diseases Clinic with documentation in the medical record in order to provide continuity of care and long term follow-up. This continuity benefits both the patient and the Infectious Diseases subspecialty resident. Supervision of outpatient intravenous antibiotics and ambulatory care of the HIV infected patient are the major reasons for follow-up care.

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

A subspecialty resident 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 subspecialty resident and specialty resident will be made by the program director and attending faculty on service. A subspecialty resident will be on call each day of the month. Each trainee will have an average 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 subspecialty resident 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 subspecialty resident. If there is no subspecialty resident on service during the month the specialty resident will take call on a regular basis. 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 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 subspecialty resident and/or specialty resident. The students will be active members of the consult team and will be supervised by the subspecialty residents, 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 subspecialty resident and specialty resident, but this is not mandatory.

When possible, the subspecialty resident 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, subspecialty resident 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.

Admissions to the 23 hour service will be seen by the subspecialty residents and an Infectious Diseases attending physician. For the most part these patients are admitted through the Infectious Diseases Clinics and are already assigned to a subspecialty resident. It is the responsibility of the admitting subspecialty resident to write the notes and orders on their patients. When available, the attending who staffed the patient in the clinic will attend on these patients. When the clinic attending is not available, the inpatient attending of the month will attend on the patients admitted to the 23 hour service through the clinics.

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, subspecialty resident 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 subspecialty resident 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 specialty 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 and sign out to the subspecialty resident 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 subspecialty resident is responsible for 10 to 15 patients at the Saint Louis University Hospital. Subspecialty residents 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 HSC Transplant Service. Subspecialty residents see community acquired infections on the general medicine floors, including bacterial pneumonia

and acute meningitis. Subspecialty residents see pediatric infectious diseases problems at the Cardinal Glennon Children's Hospital. These two institutions present a broad range of acute and chronic infectious disease problems.

II. Ambulatory Care Facilities - Experience

The outpatient clinics for the Infectious Diseases Service are located in the New Hope Clinic located one block from the Infectious Diseases offices and Saint Louis University Hospital. The subspecialty resident has one clinic per week from 8:30am – 12:00pm. The clinic consists 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 subspecialty resident will attend approximately 50 outpatient clinics per year. The average number of patients examined per clinic will be 6, including one new patient visit, resulting in approximately 300 patient visits per year, or 600 visits in two years. The subspecialty residents 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 subspecialty residents will make the majority of decisions, with difficult decisions made in consultation with the attending physician.

Continuity of care is provided by arranging for subspecialty residents 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 period.

III. Educational Program

The faculty conduct patient care and teaching rounds daily. It is expected that the subspecialty resident, 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, and textbook reading. As the subspecialty resident progresses, individual literature review and library research is performed in preparation for patient care, research conferences, and clinical rounds. Funds are available to support subspecialty resident educational needs including attendance at national meetings and symposia, books and journals.

The subspecialty residents 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. In addition, presentations at Journal Club, Immunology Review and Research Conference are required. Each resident presents at least one case and brief literature review weekly while on the clinical service. On occasion, Medicine Grand Rounds cases are presented jointly by senior subspecialty residents and faculty.

Subspecialty residents are supervised in the aspiration of abscesses; this is not a difficult technical procedure, and it is anticipated that subspecialty residents in Infectious Diseases will be

proficient at this following their training as medical students and house officers. The faculty will supervise the initial aspiration of an abscess and document this performance in the clinical evaluation of the subspecialty resident. The subspecialty residents are supervised in the management and maintenance of indwelling vascular catheters on the in-patient service.

Each subspecialty resident 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 subspecialty resident at a national meeting.

IV. Evaluation

The supervising faculty member is directly responsible for the evaluation of the subspecialty resident on the Clinical Infectious Diseases Service. Written evaluations are performed monthly and discussed with the subspecialty resident and are submitted to the Program Director of Infectious Diseases. A written summary of the subspecialty resident's performance during research activities is also provided at the end of the research period, or a minimum of every six months, to the Infectious Diseases Program Director. All evaluations become part of each resident's permanent file and kept in the Division of Infectious Diseases.

The Residency Evaluation Committee for Infectious Diseases consists of the full-time faculty and is chaired by the Program Director. Annual evaluations of the subspecialty residents are reviewed by the Residency Evaluation Committee. The Program Director reviews each subspecialty resident performance every six months. If deficiencies in the subspecialty resident 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 for Infectious Diseases. Residents 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 subspecialty resident. Procedures which are directly supervised by the faculty member are incorporated into each written evaluation.

The faculty 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. Subspecialty resident'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 subspecialty resident's meeting with the Program Director. In addition, review and evaluation of the training program is performed on an annual basis.

Resident's 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 subspecialty residents and faculty, 4) modification of rotation in clinical microbiology, and 5) modification of the clinic and conference schedule.

IV. Related Disciplines

Subspecialty residents in Infectious Diseases directly interact with the specialty and subspecialty training programs of surgery, psychiatry, pediatrics, internal medicine, and obstetrics.

Interaction occurs during inpatient consultation, clinic, direct care, and infection control activities. Subspecialty residents participate in 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 subspecialty resident 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.

A one month 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 a written evaluation is performed at the completion of the rotation. There is also a scheduled clinical Microbiology Conference.

A one month rotation in infection control is also required to understand the role of infection control program in the hospital. The rotation is supervised by the infection control officer of the hospital and a written 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.

VI. 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 Residency Review Committee with recommendations submitted to the Program Director when appropriate. The Division Director is directly responsible to the Department Chairman for the faculty, curriculum, and subspecialty residents. Annual evaluations of faculty and subspecialty residents are submitted to the Chairman of the Department of Internal Medicine.

Patients are seen in consultation from other services at Saint Louis University Hospital. The subspecialty residents 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 subspecialty resident and attending physician are directly responsible for the supervision of medical students' and Internal Medicine residents' evaluation, diagnostic work-up, and treatment plan for patients on the Clinical Infectious Diseases Service. In addition to the educational component of patient care supervision, the Infectious Diseases subspecialty residents 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.

VII. Research

The Division of Infectious Diseases has extensive research activity in vaccine biology and basic infectious diseases research. Two major 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), industry funded investigations primarily in vaccine development, dengue 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.

Subspecialty residents are required to participate in scholarly activity. Residents who plan a primary clinical career in Infectious Diseases are encouraged to undertake a clinical research program 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 subspecialty residents are expected to write the protocol, work with the mentor in developing the informed consent, and submit the protocol to the IRB for approval. After approval, the subspecialty resident works with faculty and staff to recruit volunteers, vaccinate volunteers, and draw blood on volunteers. Laboratory assays are an important component of evaluation of these vaccines. The subspecialty residents are required to work with the laboratory scientists to develop the appropriate set of tools to assay the blood for appropriate immune responses to the vaccines. 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 subspecialty residents, and this can be in either a poster session or oral presentation. Writing up the manuscript is ideally accomplished by the subspecialty resident, but on occasion this is done by the faculty member if the resident has already left the program.

During the second year and beyond, subspecialty residents are required to present a research conference 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.

Subspecialty residents 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 subspecialty residents 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.

VIII. 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, members of the division include one faculty with MD/PhD and his basic research is conveyed to the subspecialty residents through discussions at Journal Club, Research Conference, as well as Clinical Conference. Three members of the Division of Infectious Diseases are basic scientists with 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, by the Department Molecular Microbiology, and other seminars within the University.

Residents gain an understanding of the evaluation of medical literature through the Current Topics Conference. 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 subspecialty residents. 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 subspecialty residents 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.

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 AIDS clinic provide important informational background to our students and other subspecialty residents. 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.

IX. On Call Responsibilities

Each subspecialty resident has at least one twenty-four hour period every seven days free of any clinical responsibilities. Coverage is provided by other subspecialty residents within the program. The on-call duties of the Infectious Diseases subspecialty resident 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 Specialty and Infectious Disease Subspecialty Resident Responsibilities While Rotating on the Clinical Infectious Diseases Consultative Service

Outlined below are the responsibilities of the student, specialty resident and subspecialty resident 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 subspecialty residents and specialty residents are rotating on the Infectious Diseases Service, the specialty resident will share the patient responsibilities with the Infectious Diseases subspecialty resident responsible for administrative matters and for teaching as well as patient care.

2. A subspecialty resident and/or specialty resident will be on call for infectious diseases consultations seven days a week. The call schedule for the specialty resident and subspecialty resident will be made by the Program Director and the Attending Faculty on service. A subspecialty resident will be on call every day of the month. In general there is no night call for the specialty resident when a subspecialty resident 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 subspecialty resident. If there is no subspecialty resident on service during the month the specialty resident will take call on a regular basis. 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 subspecialty resident, 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.

5. Medical students may be assigned to the subspecialty resident and/or specialty resident. The students will be active members of the consult team and will be supervised by the subspecialty residents 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 subspecialty resident and specialty resident, but this is not mandatory. Students are not required to be present on weekend or holidays.

6. When possible, the subspecialty resident 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, subspecialty resident 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. Admissions to the 23 hour unit will be seen by the subspecialty residents. For the most part, these patients are admitted through the Infectious Diseases Clinics and are patients of the subspecialty residents. It is the responsibility of the admitting subspecialty resident to write the notes and orders on their patients. When available, the attending who staffed the patient in clinic will attend on these patients. When the clinic attending physician is not available the infectious disease physician on service will attend on the patients admitted to the 23 hour unit through the clinics.

8. 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 subspecialty 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 rounds, the subspecialty resident 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.

9. Laboratory rounds will be made every day 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.

10. 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.

11. An updated patient list should be printed and given to the attending each morning by the subspecialty resident.

12. Current Topics in Infectious Diseases Conference will be held every Monday morning promptly at 8 am. The subspecialty resident, specialty resident, and student on the Infectious Diseases Service are required to attend and participate in this conference. A schedule is posted on the Infectious Diseases office bulletin board and copies are available from the Infectious Diseases secretary. Each Internal Medicine specialty resident and student will be expected to present one time during the rotation. Assignments will be made by the subspecialty resident or attending. Subspecialty residents are assigned to a specific group according to the master schedule. The

quality of presentations will be considered in the evaluation of ID subspecialty residents, specialty residents, and students.

13. Subspecialty residents, specialty residents and students will attend the Infectious Diseases Research Conference on each Wednesday at 8:00 am and the Internal Medicine Grand Rounds each Friday at 7:30 am. Subspecialty residents will be required to present at Research Conference during year two, and in year three when applicable.

14. The weekly ID clinical conferences will be held each Friday at 11:00am at Saint Louis University or 12:00pm at the John Cochran VA Hospital. Subspecialty residents, specialty residents, and students will attend these conferences and will prepare to present and discuss cases and selected topics in infectious diseases. A review of the literature relevant to the case is required of the subspecialty resident. The quality of these presentations will be considered in the evaluation of students, specialty residents, and subspecialty residents.

15. Immunology Review Conference is held 10 to 12 times per year on Mondays at 8:00am in conjunction with the Allergy members of the Division.

16. Infectious Diseases Clinics are to be attended by the subspecialty resident. 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.

17. 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 I. D. rotation patients and sign out to the subspecialty resident prior to leaving for clinic. Subspecialty residents wishing to attend the other clinics must have approval of the attending physician on service.

18. The subspecialty resident, specialty resident, or student are responsible for managing coverage any time for which they are 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 subspecialty resident, specialty resident, or student. Appropriate clinical information must be communicated to the individual providing coverage when an individual is unable to meet their responsibilities.

19. 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).

20. 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 subspecialty residents in the Infectious Diseases Division. Subspecialty residents 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.)

21. The Infectious Disease subspecialty residents, Internal Medicine specialty residents, and medical students on the inpatient service are required to attend the Clinical Microbiology Conference on Thursdays at 8:00am.

22. Consults will be assigned by the subspecialty resident 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**
- **Vaccinations**

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Weekly
Infectious Diseases Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
7:30am					**IM Grand Rounds** (LRC Aud A)
8:00am	**Current Topics or Immunology Review** (DRC-8 Conf Rm)		**Research Conference** (DRC-8 Conf Rm)	**Clinical Microbiology 1st, 3rd, 4th & 5th Thurs, 8-8:30am** (Hospital Lab) **Infection Control Mtg 2nd Thurs, 8-9am** (Medical Staff Lounge)	
8:30am		**ID Clinic** (Drummond Hall Suite 100)			
9:00am				**ID Clinic** (Drummond Hall Suite 100)	
10:00am					
11:00am				**Clinical Conference*** (DRC-8 Conf Rm)	
12:00noon			**Subspecialty Residents Conference** (Drummond Hall Suite 100 or DRC-8)		
1:00pm	**Attending Rounds**	**Attending Rounds**	**Attending Rounds**	**Attending Rounds**	**Attending Rounds**
2:00pm					
3:00pm					
4:00pm					
5:00pm					

NOTE: * **4th Thursday** of the month – **Clinical Conference** will be held at 12:00 noon the **VA Hospital**

Curriculum Description

The purpose of these block diagrams is to give the Residency Review Committee an over view of what takes place during each year of training. Please complete these diagrams with this purpose in mind, one diagram for each setting in each year of training. Draw a vertical line through the diagram to separate set rotations or blocks of time. Indicate ambulatory continuity experience by a horizontal line. If additional years of training are offered, duplicate this page as necessary and number accordingly. Please be sure to refer to the instructions regarding additional years of training located in the general narrative of this form.

Block Diagram For First Year

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

Block Diagram For Second Year

Months	1	2	3	4	5	6	7	8	9	10	11	12
Name of experience or rotation	Inpatient Consult	Inpatient Consult	Inpatient Consult	Inpatient Consult	Infection Control	Pediatric	Elective	Elective	Elective	Elective	Elective	Elective
Required or Elective	**R**	**R**	**R**	**R**	**R**	**R**	**E**	**E**	**E**	**E**	**E**	**E**
Location (Hospital)	**1**	**1**	**1**	**1**	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**
Frequency (# days per week)	**6**	**6**	**6**	**5**	**6**	**6**	**5**	**5**	**5**	**5**	**5**	**5**
Ambulatory Clinic	½ day per week											

Block Diagram for Third Year (If Applicable)

Months	1	2	3	4	5	6	7	8	9	10	11	12
Name of experience or rotation	Inpatient Consult	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**
Location (Hospital)	**1**	**1**	**1**	**1**	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**
Frequency (# days per week)	**6**	**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 months	13 months	13 months
Pediatric ID	1 month	1 month	1 month
Infectious Disease Clinic	½ day per week	½ day per week	½ day per week
Clinical Microbiology	1 month	1 month	1 month
Clinical/Laboratory Research	8 months	20 months	32 months
Infection Control	1 month	1 month	1 month

Infectious Diseases Subspecialty Residents Rotation at Saint Louis University Hospital

The Infectious Diseases Subspecialty Resident is required to be trained in all aspects of the subspecialty of Infectious Diseases. The subspecialty resident is required to spend twelve months 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 HSC transplantation). The subspecialty trainee will be an integral member of the inpatient consultation team (attending physician, subspecialty resident, Internal Medicine resident and medical students). The subspecialty trainee is directly supervised by the attending physician faculty member on all aspects of clinical care and performance. Attending physicians rotate on a one month basis and the subspecialty residents are scheduled for 8 months in their first year of training (PGY-4) and 4 months 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 subspecialty trainee with over 100 (25%) consultations in immune suppressed patients.

The hospital is physically located one block from the Infectious Diseases 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, Subspecialty Residents 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 subspecialty resident 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 subspecialty trainee 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
- 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
- Subspecialty Residents Didactic Conference
- Immunology Review conference
- Internal Medicine Grand Rounds

Mix of Diseases

The major diseases evaluated at Saint Louis University Hospital are 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 subspecialty resident 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 Subspecialty Residents Evaluation Committee (Faculty).

Infectious Diseases Subspecialty Residents Experience in the New Hope Clinic

The Infectious Diseases Subspecialty Resident 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 subspecialty residents 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 subspecialty residents (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 subspecialty trainee. Progressive independence and responsibility are expected and required as the subspecialty trainee 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 subspecialty trainee 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
- 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 HIV infection
- Understand the natural history, diagnosis and management of secondary opportunistic infections and malignancies associated with HIV infection
- Understand the drug therapy, tonicities, 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 (osteomyelitis, infective endocarditis, suppurative arthritis, liver abscesses, selected pneumonias, and fungal infections). In addition, a variety of other complex infectious diseases are 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 subspecialty resident 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 Disease Subspecialty Residents Rotation in Infection Control

The Infectious Disease Subspecialty Resident 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 Saint Louis University Hospital, under the direct supervision of the Infection Control Officer who is a board certified internist and infectious diseases specialist with over 20 years of experience directing the Infection Control Program at Saint Louis University Hospital.

The Infection Control Officer is a Fellow of the Infectious Diseases Society of America and a member of the Society for Healthcare Epidemiology of America. 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 subspecialty resident 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 subspecialty resident is directly supervised by the Infection Control Officer during this experience.

Overview of Infection Control Program

Infection Control Committee Membership

The expertise of the Infection Control Committee is derived from the chairman, an internist with a subspecialty in infectious diseases; the Infection control Practitioners (ICP); and from a multidisciplinary committee membership including the Director of the Microbiology Laboratory, and representation from Administration, Nursing, Surgical and medical staff, and the Employee health physician and nurse. Representation from all other hospital department and the Public Health Department are available on a consultative basis.

Program Description

Saint Louis University Hospital is a tertiary care facility. Our clinical specialties include solid organ transplantation, bone marrow transplants, invasive cardiology, trauma, and investigational oncology. We do not provide obstetrics or gynecology, and only limited pediatrics on an inpatient and outpatient basis. Our surveillance activities are therefore directed to a high-risk population at high risk for infection due to immunosuppression, investigational oncology protocols, and specialized invasive procedures.

Surveillance by Objectives (SBO) is utilized in order to perform focused reviews to monitor and evaluate the care of high risk patients, and to survey infections associated with highest morbidity and mortality. The surveillance program is outlined in Appendix A.

The definitions of infections utilized for surveillance are based on the criteria developed by the Center for Diseases Control and Prevention.

The definitions include:

1. Criteria for colonization, nosocomial, and community acquired infections by body site specific definitions are found in Appendix B
2. All positive cultures are reviewed for the purpose of trend analysis and case identification

In order to assure accuracy, surveillance data is reviewed by all affected groups. This includes a quality assessment by:

1. Consultations with the Infection Control Officer and attending physicians
2. A review of aggregate data by the Infection Control Committee
3. Deliberation between the Infection Control Practitioners
4. Service Chiefs
5. Medical Directors
6. Nurse Managers

The Infection Control Committee evaluates work related infections, determines appropriate action and coordinates follow-up with Employee Health (see Employee Health section).

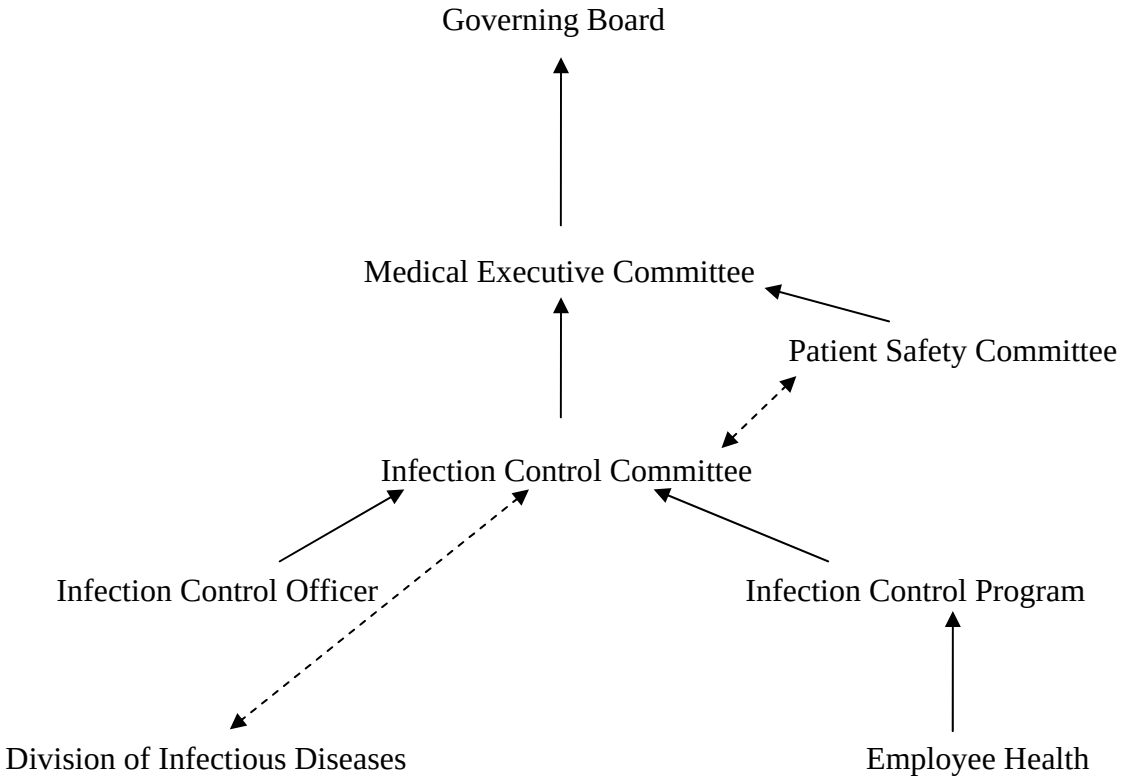
Additionally, ongoing review and evaluation of all aseptic, isolation and sanitation techniques employed are performed by annual review of all policies and procedures. Departmental environmental surveillance assessments are reported to the Committee monthly.

Analysis of this data determines the need for further surveillance or the need to institute any preventative and/or control procedures related to the environment as well as patient care practices.

Program Implementation and Communication

Selected significant activities are reported to the Medical Executive Committee and to the Board of Trustees.

COMMUNICATION DIAGRAM



Program Elements

Patient Care Quality Assessment

1. Each area involved in patient care performs assessments through the Stay Ready, Stay Safe Program to assure compliance with the Saint Louis University Hospital Infection Control Program, OSHA, JCAHO, and state the local Department of Health Standards. Results are reported to Medical Staff committees with defined action plan and follow-up to document correction of any deficiencies.
2. Activities which related to Infection Control are performed with input from the Infection Control Practitioners and recommendations for reviews from the Infection Control Committee.

Policies and Procedures

Policies and procedures are written to establish specific standards for infection control and patient care practices. These standards are compiled in a generic infection control program manual and are used to develop and review each department's infection control program. The generic standards are based on guidelines from the Centers for Diseases Control and Prevention, JCAHO standards, and on the needs of Saint Louis University Hospital patients, personnel and environment as assessed by the Infection Control Committee. The generic manual is reviewed and updated at least annually by the Infection Control Committee. It is also reviewed and approved by the Medical Staff and Administration.

Program Education Orientation

1. The members of the Infection Control Committee are oriented at the beginning of each year as to the goals, purpose, and responsibility of the Committee and its members. Included in this review are the definitions of infection (e.g., nosocomial and by site), the policy and procedure review process, and an introduction to the standards of infection control formulated by the Committee. This information is presented to members in the Annual Infection Control Committee Program evaluation and program plans for the following year. Education is a major element both for new employees as sell as current employees including volunteers. Infection control education is a requirement in the employee performance evaluation process, and includes education of house staff, nursing students and students of any other health-related schools interacting with Saint Louis University Hospital.
2. Content of educational programs is based on needs identified through surveillance activities, departmental reviews, OSHA regulations, employee health needs, and reviews of infection control policies and procedures.

Authority to Isolate/Culture

1. The Infection Control Practitioners shall first request that the attending physician order the appropriate isolation and/or culture and susceptibilities for the patient.
2. If the attending physician is unavailable to isolate or order cultures, the Infection Control Practitioners shall contact the Infection Control Officer. The appropriate isolation measures or

cultures and susceptibilities can then be initiated. The Infection Control officer shall document in the Physician's Progress Notes:

a. Request for specific isolation or culture

b. Reason isolation or culture is necessary

3. In the event the Infection Control Officer is unavailable, the Infection Control Practitioners shall initiate the appropriate isolation, cultures, and susceptibilities and review the decisions with the Infection Control Officer as soon as possible. Infection Control's decision shall be documented in the Physician's Progress Notes, including:

    a. Attempt to reach the attending physician

    b. Attempt to reach the Infection Control Officer (or designee)

    c. Reason for isolation or culture

    d. Type of isolation or culture required

4. The Infection Control Officer's response to the Infection Control Practitioner's decision shall be documented in the Physician's Progress Notes.

Employee Health

Infection Control aspects of Employee Health are addressed by the Infection Control Committee in cooperation with Employee Health. Follow-up of employee health problems is coordinated by Employee Health with the assistance of the Emergency Department, the Safety office, and the Infection Control Practitioners (ICP).

Policies and Procedures (Departmental)

Policies and procedures related to aseptic, isolation, and sanitation techniques are developed for all clinical areas and approved by the Infection Control Committee.

Product Evaluation

1. The Products Committee evaluates and recommends the purchase of all patient care supplies, based upon product trials with input from the Infection Control Practitioners, the Infection Control Committee and the Pharmacy, Therapeutics, Nutrition Transfusion (PTNT) Committee.
2. All equipment and supplies used for sterilization, disinfection and decontamination purposes are also evaluated and approved by the Infection Control Committee prior to use.

Special Studies Related to Infections

1. The need for special studies is based upon culture results, environmental surveillance, requests from physicians or departments, and the routine surveillance of nosocomial infections.
2. The need for focused reviews is determined with consultation from the Infection control Officer and Practitioners. The studies are then coordinated by the affected department with input and/or assistance from the Infection Control Practitioners. The Infection Control Committee evaluates the completed study. Recommendations are given to the involved practitioner or department and reported to the Medical Executive Committee.

3. Surveillance of nosocomial infections as well as employee exposure to infectious diseases is accomplished through the combined efforts of the ICP and the Safety Director in conjunction with Saint Louis University Hospital Employee Health and with the input of the Infectious Diseases Division.

Environmental Surveillance

1. All environmental cultures, e.g., Hemodialysis water cultures and cultures used to evaluate sterilization procedures are reviewed monthly by the Infection Control Practitioners and reported to the Infection Control Committee for determining the need for required follow-up or policy/procedure revisions.
2. Safety/Infection Control rounds are performed at least monthly to evaluate each department. This is accomplished through the Stay Ready, Stay Safe Program.

Hospital Disposal System

1. The evaluation of the Hospital disposal system for all liquid and solid wastes is performed by the Environment of Care Committee. An Infection Control Practitioner is a standing member of this committee.
2. The Waste management Program is reviewed, revised and approved by the Infection Control Committee.

Other Functions

1. Evaluate Hospital departmental effectiveness of incorporating Infection Control Committee guidelines in the formulation of policy and the execution of procedures.
2. Recommend changes in the Infection Control Committee Program as necessary to insure correction of recognized deficiencies not addressed or resolved.

Program Evaluation

The Infection Control Committee reviews the program annually. Evaluation includes (but is not limited to):

1. Hospital departmental effectiveness of incorporating Infection Control Committee guidelines in the formulation of policy and the execution of procedures.
2. Changes in the Infection Control Committee program as necessary to ensure correction of recognized deficiencies not addressed or resolved.

Hospital Educational Programs

All new employees receive an Infection control In-service during orientation including information on the current OSHA Occupational Exposure to Bloodborne Pathogens, current Federal Register and current Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities. This education is given prior to new employees being assigned to tasks where occupational exposure may occur. Included in this education is an explanation of:

1. The epidemiology and symptoms of blood borne diseases and tuberculosis
2. Modes of transmission
3. The employer's exposure control plan and the means by which the employee can obtain a copy of the written plan
4. The appropriate methods for recognizing the tasks and other activities that may involve exposure to blood and other potentially infectious materials and that may involve exposure to tuberculosis
5. The use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment

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

The Infectious Diseases subspecialty resident is required to be familiar with infectious diseases in the pediatric population. The subspecialty resident is required to spend a four week rotation on the 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 subspecialty resident will be an integral member of the inpatient consultation team (attending physician, subspecialty resident, pediatric resident, and medical students). The subspecialty trainee 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 and the infectious disease subspecialty residents 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, Subspecialty Residents 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 subspecialty resident improves their overall skills.

Goals and Objectives

The overall goal of the experience is to familiarize the adult subspecialty resident 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
- Subspecialty Resident 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 subspecialty resident 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 subspecialty resident's performance. Any deficiencies are immediately reported to the Program Director for individual management or referred to the Subspecialty Residents Evaluation committee (faculty).

Infectious Diseases Subspecialty Residents Rotation in the Clinical Microbiology Laboratory

The Infectious Diseases Subspecialty resident is required to be trained in the fundamentals of diagnostic clinical microbiology and virology. This training consists of a three week rotation at Saint Louis University Hospital Diagnostic Clinical Microbiology Laboratory and one week rotation at Cardinal Glennon Children's Hospital Diagnostic Virology Laboratory under the direct supervision of the Director of the Diagnostic Microbiology Laboratory. The Director is a full time faculty member in the Department of Pathology at Saint Louis University and has been recently trained and has over 2 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 subspecialty resident is evaluated for the core competencies by the Director of the diagnostic Microbiology Laboratory at the midpoint and conclusion of the experience. The subspecialty trainee'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.

Curriculum Review Articles (with links to web pages)

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**