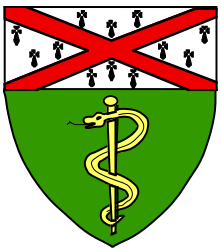


YALE UNIVERSITY SCHOOL OF MEDICINE
AND
YALE–NEW HAVEN HOSPITAL

RESIDENCY TRAINING PROGRAM IN ANATOMIC AND CLINICAL PATHOLOGY

Department of Pathology and Department of Laboratory Medicine

2011 - 2012

Pathology Residency Training Program

Department of Pathology
and
Department of Laboratory Medicine

Yale University School of Medicine
Yale-New Haven Hospital

John H. Sinard, MD, PhD
Director

G. Kenneth Haines, MD
Henry Rinder, MD
Associate Directors

June, 2011

Table of Contents

Training Program Structure and Requirements

The Yale-New Haven Medical Center consists of the 944-bed Yale New Haven Hospital and the affiliated Yale University School of Medicine. The hospital includes the Smilow Cancer Hospital at Yale-New Haven, the 201-bed Yale-New Haven Children's Hospital, and the 76-bed Yale-New Haven Psychiatric Hospital. The Yale-New Haven Medical Center provides training for residents seeking Board certification in Anatomic Pathology (AP), Clinical Pathology (CP), and both Anatomic and Clinical Pathology (AP/CP). The mission of our ACGME-accredited training program is to provide comprehensive post-graduate training and to produce pathologists who will be leaders in clinical practice, research, and academia, and who will advance the field of pathology locally, nationally, and internationally.

Pathology training at Yale focuses on developing and enhancing the role of the pathologist as a diagnostic consultant, using both traditional techniques and state-of-the-art approaches. Our faculty provide diverse role models for residents and have a proven track record for the highest quality teaching.

Combined with extensive pathology fellowship opportunities, our residency program has produced internationally recognized academicians and scientists as well as community pathology leaders. Although most of our graduates proceed along traditional pathways of pathology practice, others have pursued positions in forensic medicine, biotechnology, healthcare administration, and the law. Our diverse graduates are united by the common theme of being among the best in their chosen pathology career.

PROGRAM OVERVIEW *(Updated 2011)*

Residency training in Pathology is provided by the Department of Pathology and the Department of Laboratory Medicine. Working together under a single Program Director, the two departments assure strong training in both Anatomic and Clinical Pathology.

The Department of Pathology is comprised of anatomical pathology services, research laboratories, and support services. Some of Pathology's research laboratories are affiliated with programs physically located in the Boyer Center for Molecular Medicine. The Division of Anatomical Pathology (the clinical Division of the Department) provides autopsy, cytology, and surgical pathology services to all hospitals in the Yale New Haven Medical Center, the West Haven campus of the Veterans Administration Healthcare System (VA), Bridgeport Hospital, and to private physician offices. Residents thus are exposed to a very broad range of clinical material, from the common everyday specimens to rare and unusual diseases and neoplasms. The faculty all have subspecialty interests, and residents rotate through the subspecialty systems affording them in-depth exposure and expert training in each area of anatomic pathology. Services that support the department include histology, immunohistochemistry, molecular diagnostics, electron microscopy/advanced imaging, operational informatics, and the report generation unit.

The Department of Laboratory Medicine consists of clinical pathology services, research laboratories, and support services. Some of the research laboratories are affiliated with programs physically located in the Anlyan Center. The clinical laboratories include the Blood Bank, Chemistry, Hematology, Immunology and Flow Cytometry, Microbiology, Virology, Molecular Diagnostics, Apheresis and Stem Cell Processing, and Computer and Instrumentation Services. These are the primary laboratories for Yale-New Haven Medical Center and the Yale Medical Group. They also serve as a core facility for Yale University clinical research centers and as national reference laboratories. The clinical labs recently moved into brand new space in the Park Street Building. The Department also staffs the clinical laboratories at the Veterans Administration Connecticut Healthcare System's West Haven campus, including its mycobacteriology and virology National Reference Laboratories. Residents are exposed to everything from the basic science of testing conceptualization to practical realization in the clinical laboratory and application to patient care. Residents work on research and/or developmental projects in the laboratories and serve as consultants to hospital physicians on the use and interpretation of laboratory data.

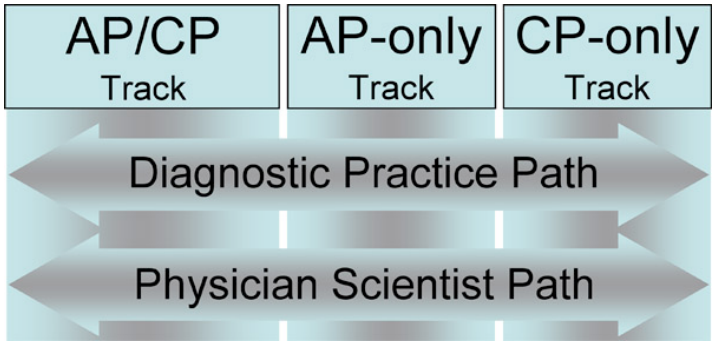
Resident Manual

This manual describing the training tracks available, rotation descriptions, resident responsibilities and competencies, and resident benefits is provided to applicants at the time of interview and to residents when they enter the program. This information is also available on the residency program web site (yale.edu/pathresprog).

TRAINING

Training Tracks and Paths

Residents are accepted for training onto one of three tracks, and generally follow one of two career paths. This provides trainees an opportunity to tailor their training experience for their own specific career goals. The program endeavors to accommodate a variety of training schedules and goals without compromising core training. However, since resident responsibilities are integrated into the functioning of the services and patient care cannot be compromised, advanced planning in consultation with the Program Director is important in developing a customized training program.



Available training tracks are Anatomic Pathology only (AP), Clinical Pathology only (CP), or combined Anatomic and Clinical Pathology (AP/CP). AP-only and CP-only training are three-year programs; combined AP/CP training is four years. All three tracks include similar core rotations with specific responsibilities designed to convey competency in the diagnostic practice of pathology. Within each track, residents can pursue one of two career paths: "diagnostic practice" and "physician-scientist". The diagnostic practice path is for those residents who plan to spend the majority of their professional career as clinicians in either an academic or community setting. Trainees on this track typically go on to subspecialty fellowships

and/or clinical jobs upon completion of their residency training. Residents interested in a career as a physician-scientist (or physician-engineer, etc.) plan to spend the majority of their professional time in investigative research. Candidates for this path often have significant research experience and/or a PhD prior to residency, but this is not a requirement. Research may be pursued with any mentor in any department within Yale University, and salary funding is guaranteed for at least two full years of research following residency.

Combined Anatomic and Clinical Pathology (AP/CP) Training Track

The AP/CP training track provides broad training in all of the sub-disciplines of anatomic and clinical pathology. This 48 month program is the most common training track, and prepares residents for broad career options ranging from a small community private practice to a large academic medical center. The majority of AP/CP track residents go on to subspecialty fellowship training following their residency, although some graduates have gone straight into clinical practice or full time research.

Combined Anatomic and Clinical Pathology training includes 24 months of core AP rotations and 18 months of core CP rotations. Core training teaches the principles of gross, microscopic, and analytical evaluation of specimens and laboratory data graduated responsibility tailored to each resident's individual progress. Senior rotations encourage the resident to assume responsibility for the professional supervision of the services, often functioning as a junior attending. Elective opportunities allow for advanced training and/or investigative work with a faculty sponsor.

Residents most commonly do AP or CP rotations in six or twelve month blocks. Because of the flexibility of the program, there can be little correlation between a resident's PGY (post graduate year) status and their rotations. For example, a PGY-1 resident may start their training with clinical pathology rotations alongside PGY-3 residents who have already completed two years of anatomic pathology rotations. The performance expectations of these two residents would be comparable, since they are both just beginning their clinical pathology training. Residents are therefore collectively referred to by the group of rotations that they are currently doing. For example, PGY-3 residents who have completed two years of training in AP and are beginning their training in CP are "CP-1" residents, just as are PGY-1 residents who begin their training in CP. PGY-4 AP/CP residents typically do some combination of CP-2 and AP-3 rotations. Within each year, clinical training is divided into a series of rotations, each typically four weeks in duration. There are, therefore, 13 rotations each academic year. The scheduling of residents to the various rotations is the responsibility of the Chief Residents in anatomic and clinical pathology, respectively.

AP/CP training typically begins with 2 years of AP followed by one year of CP followed by a year combining six months of senior CP training and six months of flexible training opportunities, including advanced training and/or basic research (experimental pathology), but past residents have chosen other options:

24 months core AP training, 18 months core CP training, 6 months AP senior resident rotations
24 months core AP training, 18 months core CP training, 6 months specialty training in AP or CP
24 months core AP training, 18 months core CP training, 6 months research experience
12 months core AP training, 12 months core CP training, 12 months core AP training, 6 months core CP training, 6 months AP senior resident rotations
18 months core CP training, 6 months additional CP training, 24 months core AP training

Communication with the Program Director of your interests and plans early in your training is crucial to designing your training path.

Core training in AP *(Updated 2011)*

During the first 12 months of anatomic pathology training, AP-1 residents focus on acquiring the technical skills that will form the basis for their careers in pathology. They also must acquire a fund of knowledge to be able to apply these skills intelligently as physicians (not technicians) towards the goal of becoming diagnosticians. The first year of core training in AP includes multiple rotations on the autopsy service. Residents acquire familiarity with a variety of dissection techniques, learn anatomy, and learn how human disease is manifested in anatomic changes throughout the body. Exposure to Forensic Pathology and Neuropathology is integrated into the autopsy experience. Residents also begin their training in Surgical Pathology and Cytopathology during their first year of AP. Rotations through the major surgical pathology services at YNHH (eg breast, GI, GYN) as well as in general surgical pathology at the VA Connecticut introduce residents to the broad scope of surgical pathology material. The subspecialty-focused training at YNHH affords the resident an in-depth exposure to these major areas of surgical pathology practice. Each AP-1 resident also does one rotation in Cytopathology.

Residents in their first year of AP training also do a one-week rotation through Laboratory Medicine as an early exposure to CP training. Understanding the structure and operations in Laboratory Medicine allow the residents to better interact with fellow residents on CP rotations. This exposure also may stimulate residents who find they have a strong affinity for a particular area in CP to consider spending their entire second year of training in CP. This one-week rotation through Lab Medicine is combined with a one-week exposure to the Molecular Diagnostics Lab in Pathology.

In the second year of core anatomic pathology training, AP-2 residents further expand their histopathologic diagnostic skills by focusing on a broader range of specialty areas within pathology, and delving deeper into an understanding of differential diagnoses. They also become more actively involved in interdepartmental interactions, taking on the role of a diagnostic consultant. A second rotation in each of the major surgical pathology subspecialties is incorporated into the AP-2 year, as are rotations in hematopathology, pediatric pathology, neuropathology, dermatopathology, and ophthalmic pathology. AP-2 residents also get their first exposure to a "leadership" role in anatomic pathology by serving as a senior resident on the autopsy service, overseeing the operation of the service and the training of the AP-1 residents. Finally, elective time allows residents to pursue or enhance training in areas of special interest, or to get involved in formal research projects.

Throughout the core training in anatomic pathology, a series of daily morning conferences provides residents with both formal instruction and a longitudinal exposure to all of the areas of anatomic pathology, regardless of which rotation they are currently on.

Core training in CP *(Updated 2011)*

During the first 12 months of CP experience, CP-1 residents rotate through each of the sections of the Clinical Laboratories. The first 4-weeks of CP training consists of one-week mini-rotations in each of the major sections of the clinical laboratories. This provides an initial exposure to the breath of the discipline and prepares residents for the responsibilities of covering services after hours. This introductory exposure is then followed by an in depth experience on each of the 6 major rotations (transfusion medicine, microbiology / virology, hematology / flow cytometry, clinical chemistry / immunology, general clinical pathology at the VA, and subspecialty clinical pathology at the VA). All CP-1 residents rotate twice through each service in order to have the opportunity for more senior responsibilities on the second and subsequent rotations. Throughout their training, emphasis is placed

upon understanding the basic science and associated biotechnology of Clinical Pathology, becoming familiar and comfortable with modern instrumentation and computers, and upon the interpretation and clinical utilization of laboratory tests. To accomplish this, residents also work on research and/or developmental projects in the laboratories and serve as consultants to hospital and outside physicians. Teaching is another strong area of emphasis during CP training. Residents fully participate in medical student teaching by serving as preceptors in the hematology and microbiology laboratories.

During their final 6 or 12 months of CP training, CP-2 residents assume a more senior, supervisory role and choose directed clinical responsibilities within each laboratory. We encourage specialization in areas of interest and an in-depth experience as a junior attending.

Integration of the subspecialties is achieved through interdisciplinary teaching and clinical conferences in the Department, through on-call responsibilities, and during rotation at the VA Connecticut Healthcare System. Residents are exposed to all aspects of clinical testing from conceptualization in basic research to practical realization in the clinical laboratory and application to patient care.

Additional Training

Core training leaves six months available to AP/CP residents for additional training, and there are many options available, including research and advanced clinical rotations. The advanced clinical rotations allow the resident to function essentially in the capacity of a clinical fellow, resulting in a mini-fellowship. Experiences are available in both laboratory medicine and pathology. In anatomic pathology, a set of AP-3 rotations provide residents with exposure across all subspecialty areas of pathology to solidify their diagnostic skills. These include the "Hot Seat" rotation, Frozen Sections, Autopsy Senior Resident, and General Signout at Bridgeport Hospital. In clinical pathology, senior CP rotations similarly focus on advanced consultative and diagnostic skills within selected subspecialties. These rotations also further the resident's interactions with clinical teams and allow them to take on greater independent responsibility, gradually transitioning them to independent practice. Elective time is also available. All AP/CP residents must spend at least one month of this period on the frozen section service, to meet ACGME training requirements.

Anatomic Pathology Only (AP) and Clinical Pathology Only (CP) Training Tracks

The AP-only and CP-only training tracks provide focused training in all of the sub-disciplines of anatomic or clinical pathology, respectively. Each of these 36-month programs is for residents who have more defined career objectives at the time of applying for residency training. These three-year training programs afford residents a solid foundation in their respective discipline and an opportunity for in-depth subspecialty training and/or a significant research experience. Most commonly, AP-only and CP-only track residents go on to a career in academic pathology, typically at an academic medical center.

Residents on the AP-only or CP-only tracks who are on the diagnostic practice pathway have an emphasis on clinical science and teaching. This path often leads directly to a post-residency fellowship in such areas as Transfusion Medicine, Neuropathology, Dermatopathology, Medical Microbiology, Hematopathology, or Gastrointestinal Pathology. Other residents on the AP-only and CP-only tracks will pursue two or more years of research following their residency training. Many options exist on this physician-scientist pathway; fellowship experiences can be incorporated into training, and some residents have elected a physician-engineer track in which the research portion is oriented predominantly toward Biomedical Engineering in conjunction with the Yale Dept of Biomedical Engineering. Finally, for individuals without a PhD degree, there is the option of

enrollment in the Yale Investigative Medicine Program in which one obtains research training (translational or basic) in the context of a rigorous PhD program.

Residents are encouraged to establish a mentored relationship with a Yale University investigator to oversee their ongoing career development. The philosophy of the Program is to provide all means necessary to assure resident success in becoming a physician-scientist or physician-scholar. To that end, research may be pursued within the Department of Laboratory Medicine or the Department of Pathology, but residents are encouraged to consider mentors in other basic science or clinical departments within the School of Medicine or any other School or department at Yale University. Salary is guaranteed for at least two years of mentored research following residency training (minimum of 5 years of salary support).

AP-Only Training

Training in AP-only is most commonly for individuals who either have already decided that the focus of their clinical practice will be within some subspecialty area of anatomic pathology, or for individuals who are planning a career which combines on-going basic or applied research and a more limited clinical practice of pathology.

AP-Only training begins with the 24-month core AP curriculum described above for the AP/CP track. The third year of training typically includes at least six months of specifically designed AP-3 rotations: "Hot seat", frozen section, autopsy senior resident, and general surgical pathology signout at Bridgeport Hospital. These cross-specialty rotations carry minimal grossing responsibility and are designed to strengthen the resident's diagnostic skills, further their role as clinical consultants, and transition the resident toward the independent practice of pathology. The remaining six months can be used to spend additional time on these AP-3 rotations as well as for clinical and/or research electives. Alternatively, a full six-month block of protected research time can be arranged.

The specific research strengths in the Department of Pathology are diverse and include basic as well as translational research. Major efforts are centered in cell biology, virology, cancer biology and diagnosis, biotechnology, computational biology, vasculogenesis and vascular disease, mitochondrial biology, and structural biology. Many of the laboratories have overlapping interests and have joined together to build program projects. The department is also home to several core facilities for the institution, folded together into Yale Pathology Tissue Services, which provides tissue procurement and banking, tissue micro-array, and research histology services.

CP-Only Training

The most common pathway for the CP-only training program is designed to provide residents with: (1) a solid foundation of knowledge in all aspects of Clinical Pathology; (2) an in-depth experience in a subspecialty of particular interest; and (3) a research experience that facilitates development of an independent physician-scientist career pathway.

The 18-month CP core curriculum (see the AP/CP track above) is required for CP-only residents to assure familiarity with all aspects of Laboratory Medicine, while still allowing flexibility for sub-specialization within that 18 months and tailoring of CP electives to the individual interests of each resident. Research and/or clinical subspecialty opportunities are then available during the remainder of the 2nd and 3rd years of the CP-only track.

The format for advanced training is individualized for each resident to assure both relevance to career goals and adherence to the requirements for residency training of the American Board of Pathology. Subspecialty training is handled by giving the residents more senior, graduated responsibilities under

the direction of the attending physician. Some residents elect to participate in clinical fellowships in clinical pathology at this stage of their training, while others begin more basic research endeavors. Projects may be in practical areas, such as methods development or outcomes, or they may be in an area of basic research. The broad range of potential research opportunities can be explored in the Yale University medical faculty research database.

The specific research strengths of the Department of Laboratory Medicine are diverse and include R01 and program project funded investigators in immunohematology, molecular immunology and virology, transplantation immunology, molecular diagnostics, hemostasis, hematopoietic stem cells and progenitors, and clinical pharmacology, as well as other areas. The research laboratories (including the Yale Stem Cell Center) are located in close proximity to the clinical laboratories, facilitating ready interaction and transfer of biotechnology.

Research Experience *(Updated 2011)*

Each resident is strongly encouraged to complete some form of clinical-pathologic investigation during the course of his or her residency. A variety of options and opportunities are available, ranging from a detailed study of multiple cases using a new diagnostic approach to implementation of a new clinical diagnostic test to a basic research project. The results of the study should be presented intradepartmentally and, if appropriate, submitted for presentation as either an abstract at a national meeting or a manuscript for publication (or both). These projects should be conducted under the supervision of a faculty member in Pathology or Laboratory Medicine, and funding for these investigations are available through the faculty (who can solicit additional funding from the department if needed).

Research can be conducted during elective time, or during down time of any of the other rotations. Residents typically find that a more focused full-time effort is needed to initiate a project, but then that project can be continued on more of a part-time basis.

Residents on the physician-scientist pathway, particularly those on the AP-only and CP-only training tracks, may elect to incorporate up to six months of full time research into their training. This experience must be approved by the Program Director to be sure that it will be eligible for credit toward the training requirement. This discussion should occur no later than the first half of the academic year preceding that during which the research is planned, to assure adequate time to plan for coverage of the service needs of the program (for AP-only or CP-only tracks, this means during the first half of the second year of training). Residents must be in good standing with respect to their clinical training, and will be expected to submit a written proposal describing the purpose and scope of the planned research. The research may be conducted under the direction of a faculty member in any department at Yale University. The research proposal should be approved by the research sponsor before being submitted to the Program Director. The Departments of Pathology and/or Laboratory Medicine ***will guarantee salary funding for up to an additional two years of research*** (non-ACGME accredited) at any point after the first year of residency training, including following completion of the residency training. This will aid in launching that resident on a successful research career. Any resident planning to pursue this career path should discuss their plans with the Program Director and/or Chair of either department early in their training.

For those residents with an MD degree who desire not only research training but also a PhD degree, Yale offers an Investigative Medicine Program. Residents enter this program after completion of the residency training, and pursue additional course work and research leading to a PhD degree.

Training Requirements

The Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Pathology (ABP) impose a number of specific requirements that pathology training programs must meet to achieve accreditation and that resident trainees must meet to be deemed qualified to sit for the Board examination. Complete information on these requirements can be obtained from the web sites for these two organizations. Selected components of these requirements are listed below:

- AP-only and CP-only training require three years of training in an accredited training program. AP/CP training requires four years of training in an accredited training program.
- For primary certification, only pathology training taken in the United States or, in certain circumstances, in Canada is acceptable toward meeting the ABP requirements. The training must be in programs that have been inspected and accredited by the Accreditation Council for Graduate Medical Education or the Royal College of Physicians and Surgeons of Canada.
- The American Board of Pathology specifically indicates that "one year of approved training credit toward ABP certification requirements must be 52 weeks in duration, and the resident must document an average of 48 weeks per year of full-time pathology training over the course of the training program. Any additional leave must be made up." It is the resident's responsibility to make sure he/she completes 48 weeks of full-time training each academic year. Failure to do so will extend the training period and cause difficulties when transitioning into a fellowship. Please take into consideration the amount of interview and sick time you may need each year before taking the maximum vacation time. Maternity leave can also complicate meeting this requirement.
- Verification of the applicant's qualifications by the pathology training program director is required.
- Education in anatomic pathology must include autopsy and surgical pathology, cytopathology, pediatric pathology, dermatopathology, forensic pathology, immunopathology, histochemistry, neuropathology, ultrastructural pathology, cytogenetics, molecular biology, aspiration techniques, and other advanced diagnostic techniques as they become available.
- Education in clinical pathology must include microbiology (including bacteriology, mycology, parasitology, and virology), immunopathology, blood banking/transfusion medicine, chemical pathology, cytogenetics, hematology, coagulation, toxicology, medical microscopy (including urinalysis), molecular biologic techniques, aspiration techniques, and other advanced diagnostic techniques as they become available.
- Programs must provide residents with instruction and experience in the interpretation of laboratory data as part of patient-care decision-making and patient-care consultation. Residents must also participate in pathology conferences, rounds, teaching, and scholarly activity, and gain experience in the management and direction of a pathology laboratory.
- The educational experiences may be provided through separate, exclusive rotations, by rotations that combine more than one area, or by other means.
- There must be regularly-scheduled seminars and conferences devoted to the basic and applied medical sciences and clinical correlation conferences.
- Clinical correlation conferences should be held with clinical services
- There must be departmental conferences in which both faculty and residents participate, for detailed discussion of difficult and unusual cases.
- Residents must participate in the regular formal clinical and teaching rounds corresponding to the laboratory services to which they are assigned.
- Residents should participate in the education of medical students and other trainees.
- The volume and variety of material available in the program for anatomic pathology education must be sufficient to ensure that residents have a broad exposure to both common conditions and unusual entities. All residents should:

  - perform at least 50 autopsies. Residents must participate fully in ALL aspects of the autopsies they count toward this standard. Autopsies may be shared by up to two residents, but each must participate in all aspects of the case.
  - examine and signout at least 2,000 surgical pathology specimens
  - examine at least 1,500 cytologic specimens
  - perform at least 200 operating room consultations (frozen sections)
- The volume and variety of material available in the program for training in clinical pathology should be sufficient to ensure that residents have a broad exposure to both common conditions and unusual entities.
- The number and variety of tests performed in the laboratories should be sufficient to give residents experience in the range of tests typically available in a general hospital.
- Residents must be considered integral members of the staff of the Department and must have the opportunity to participate in discussions of matters related to management of the Department
- There must be periods of time when decision making in the laboratory is the direct responsibility of residents, under appropriate supervision.
- Residents are required to use the ACGME's internet-based Case Log System to document their experience in three areas: autopsy, fine needle aspiration, and bone marrow aspiration and biopsy. Optionally, residents or fellows may record other experiences, such as blood banking, clinical pathology consultation, or microbiology codes.
- Up to six months of a formal research experience, if performed during the pathology training program and with the approval of the program director, may be used toward credit for primary certification.

Resident Evaluations

The faculty will evaluate the residents on a monthly basis. This process is crucial for monitoring the resident's progress through their training, and identifying issues which need to be addressed in a timely fashion. The faculty member(s) with whom the resident worked will complete a written or on-line evaluation of the resident's performance and should discuss the resident's performance with him/her at the end of each rotation. The evaluations are based on the goals and objectives of each rotation in each of the competency areas, as described in this manual. Residents are provided with a template of the evaluation form so that performance expectations are fully communicated and understood.

Ancillary support staff will also perform evaluations of each house officer every six months. These multi-source evaluations focus primarily on interpersonal communications and ability to work productively with ancillary staff to maximize patient care.

All senior residents have an implicit supervisory role over the junior residents. As such, senior residents will be asked, during discussion with the Program Director, to comment on the performance of the junior residents with whom they have interacted. Likewise, junior residents will be asked to comment on the performance of their senior residents in providing them with the appropriate level of guidance and training.

Intermittently throughout the year, resident performance will be discussed at departmental attending faculty meetings. This affords an opportunity for attendings to share differing experiences that they may have had with each of the residents.

The vast majority of the evaluations are performed electronically using the E*value system. Residents are notified electronically when evaluations are completed on them, and are encouraged to review their evaluations as soon as possible for the most timely feedback. Written summaries of these evaluations are kept in the residents' files maintained by the Residency Coordinator. Residents are allowed to view their file, but files may not be removed from the Residency Coordinator's office and must be reviewed while the Residency Coordinator is in the room. The resident may not make copies of his/her file.

The Director or an Associate Director of the Program reviews all forms of evaluation and meets with each resident on an individual basis every six months to share this information, offer guidance, and seek feedback. A summation of this meeting is produced and is cosigned by the Director and resident.

Resident Evaluation of Rotations and Faculty

Each month, the residents are asked to complete an electronic rotation evaluation form and faculty evaluations form(s). This is an anonymous evaluation. Aggregate evaluations of faculty and rotations are prepared approximately every six months and shared with the individual faculty, the rotation directors, and the senior leadership of the departments.

Academic Remediation

Any resident not performing in a satisfactory manner may be placed on academic remediation. Performance will be considered substandard based on the evaluations received and/or the consensus of the faculty. While on academic remediation, the resident typically does not earn credit for rotations. Also, while on academic remediation, the resident may not participate in away electives. The resident will meet with the Director on a monthly basis to determine if adequate progress is being made and when the resident should be removed from academic remediation status. Residents who consistently (four months or longer) fail to perform at an appropriate level may be subject to dismissal from the Residency Program. All decisions relating to this process are vetted with the institutional GME office.

Resident Promotion *(Updated 2011)*

Residents will be promoted to higher levels of responsibility based on their accomplishments and achievements during the prior year. Simply putting in the time is not sufficient to assure either credit for the year toward Board Certification or advancement to the next year of training. Promotion is based on faculty consensus: the Program Director meets with the clinical faculty each June to discuss resident promotions. However, the ultimate decision lies with the Program Director. Criteria for promotion include:

- completion of 48 weeks of training per academic year
- at least 75% conference attendance during core training years
- responsible, ethical, and professional behavior
- satisfactory faculty evaluations, which includes mastery of the six competency areas
- satisfactory staff and peer evaluations, which primarily focus on interpersonal communication
- participation in research and/or teaching activities
- attaining sufficient skills and knowledge to warrant promotion

CONFERENCES *(Updated 2011)*

In addition to the laboratory and clinical work, a variety of intradepartmental conferences complement the training experience. Whereas some of the meetings consist of lectures given by departmental faculty or guest speakers, a number of conferences demand the active participation of the residents.

Attendance at morning conferences and departmental grand rounds is an important part of the training. Residents on service at the VA should attend didactic conferences at YNHH (unless there is a specific conference at the institution at which they are rotating which conflicts with the conference at YNHH, in which case the conference at the institution at which they are rotating takes precedence). Residents who are on elective rotations should still attend all conferences at YNHH unless the elective is at a distant institution. When slides are put out in advance of a conference, they should be reviewed prior to the conference. If for any reason a resident cannot give a conference at which he or she is scheduled to present, it his/her responsibility to switch with another resident.

There are a small number of conferences for which attendance is an absolute requirement. These are required by the ACGME, and if missed (even if for illness or vacation) must be made up. The majority of the conferences, however, represent an ongoing educational program for which there is a cumulative benefit for participation. Although no individual conference is essential, residents are expected to attend at least 75% of the conferences presented, especially during their core training years (AP-1, AP-2, and CP-1). Failure to do so may result in denial of credit for that ENTIRE year of training. In order to comply with ACGME guidelines regarding conference attendance, a sign-in sheet will be circulated at each conference to document attendees. ***Residents must attend at least 45 minutes of a 60-minute conference in order to claim attendance.*** Residents must assure that their attendance is documented. It is not appropriate to have a proxy sign in for you, and signing in for a conference that you did not attend represents falsification of training documentation.

Residents are being trained to be practicing pathologists, and a real part of the life of a pathologist is that service obligations and acute patient care needs take precedence over other non-essential activities. As such, covering frozen section or tending to an apheresis emergency takes precedence over conference attendance. However, morning conferences should not be missed to tend to work that should have been completed the evening before, such as reviewing of slides.

The following general conferences are to be attended by all residents, regardless of their current rotation.

Anatomic Pathology Conferences

Weekly Microscopic Case Conference (Mondays - 8:00 AM)

This conference is a discussion of miscellaneous “unknown” cases. The major purpose will be to generate a discussion of diagnostic criteria and salient histological features for a group of cases. Slides will be routinely available a few days in advance, and residents are expected to have previewed the slides and thought about diagnostic approaches prior to the conference.

Residents on each of the specialty rotations should submit slides from interesting cases to the senior resident on the “Hot-Seat” rotation. Approximately six cases, typically including one cytology case, will be discussed each week. Residents are expected to be able to describe the pathology present

on the slide, develop an appropriate differential diagnosis, know how to distinguish between the entities in the differential diagnosis, describe the pathologic features of the entity, and discuss the natural history, clinical significance, and current treatments for the entity.

Pathology Didactic Conferences (Tuesdays, Wednesdays, some Thursdays - 8:00 AM)

These conferences are generally formatted as lectures or unknown slides conferences with a specific theme, and are presented by the Clinical Faculty or invited guest speakers. Topics vary from basic diagnostic pathology, specialty areas and disease classifications, stress management, laboratory management, and special techniques. The chief resident schedules the speakers for these conferences.

Gross Conference (Many Thursdays - 8:00 AM)

This time is available for gross conferences on either surgical or autopsy cases, which are run by an attending. The senior resident on autopsy is responsible for organizing the conference with the help of the frozen section resident. It is based on generating a differential diagnosis for a disease process from the examination of gross specimens. Techniques for the appropriate handling of specimens in the gross room are also discussed.

Grand Rounds Speaker Conference (Some Thursdays - 8:00 AM)

When an outside speaker has been invited to give Departmental Grand Rounds, that speaker may give a special conference for the residents. During these weeks, this conference will replace the weekly Gross Conference. These conferences represent a rare opportunity to interact closely with a distinguished diagnostic pathologist and benefit from their years of experience.

Neuropathology Teaching Conference (One Wednesday a month - 12:00 PM) *(New 2011)*

This is a joint conference with residents from Neurology and Neurosurgery, covering basic topics in the pathology of neurological disease and including clinical-pathological correlations. It is given by the Neuropathology faculty, but delivered outside of the normal 8AM time slot to accommodate residents in other departments who also benefit from this conference.

Autopsy Case Presentation Conference (Approx. one Wednesday a month - 12:00 PM) *(New 2011)*

At this hour-long conference, three residents will each present one of their autopsy cases. The purpose of this conference is for residents to gain experience preparing and presenting a complete case, interpreting the pathologic findings in that case, and assembling those interpretations into an explanation of the sequence of events leading up to the patient's death. Throughout your career, you will be required to present cases at various clinical conferences. You must be able to do this quickly and convincingly. Each presentation should be no more than 20 minutes, including time for questions and answers. See the Autopsy Service Manual for more details.

Molecular Pathology Journal Club (Approx. one Wednesday a month - 12:00 PM) *(New 2011)*

Through the presentation and discussion of recent papers using molecular techniques, residents see and critically evaluate the use and application of molecular pathology in the evaluation of patient material. Each paper presented in the Journal Club focuses on particular techniques and how the results of those tests can be used in clinical medicine. Typically, a recent paper will be selected by the faculty in charge of the Journal Club. The Molecular Genetics Fellow will present an explanation of the techniques used in that paper. Then, a resident will present the data and discuss the conclusions of the authors with respect to the applicability of that testing to clinical medicine.

Department Grand Rounds (Thursdays - 12:30 PM)

Departmental Grand Rounds are given by a member of the Pathology faculty or by an invited guest speaker either from another department at Yale or from an outside institution. The content and format will vary depending on the speaker, and topics will range from recent research results to discussion of a clinical case. Grand Rounds typically run from September through June. Grand Rounds has been approved for by Yale's Council on Continuing Medical Education for Continuing Medical Education Credit for the faculty and those fellows who need such credit.

Resident Presentation Conference (Fridays - 8:30 AM)

This is a resident-driven and -delivered conference on a topic of the resident's choice. The conference format is variable: it may be a one-hour didactic session, or may take the form of a journal club or case series review. Residents may also use this forum to present the results of their own research projects. The presentation should be formal and should demonstrate an in-depth review of the literature, encompassing historical, clinical, and basic science aspects of an anatomic pathology-related topic. Faculty attend this conference and will ask questions of the presenter and evaluate their performance. A major goal of this conference, in addition to its educational component, is to teach the resident how to format and present a formal conference. Each AP resident will give at least one of these conferences each year.

Forensic Pathology Conference (Approximately one evening each month - 5:30 PM)

Dr. James Gill, Medical Examiner from the Bronx in New York and a former Yale Pathology resident, gives this didactic conference. This conference affords the residents a broad exposure to findings in non-natural deaths and to the medical-legal investigation of death. The conference is given in the early evening and dinner is provided. This is an important component of the resident training in forensic pathology.

Combined Anatomic Pathology / Clinical Pathology Conferences

AP/CP Case Conference (Approximately one Friday each month - 8:30 AM)

This conference is given jointly by a resident on AP rotations and a resident on CP rotations. It is based on a recent case and includes a case presentation and discussion of a disease process in which both anatomic and clinical pathology findings played a role in the workup of the patient.

Joint Didactic Conferences (Varying Days - 8:15 AM)

These conferences relate to aspects of pathology training that interface between anatomic and clinical pathology, and include areas such as informatics, molecular pathology, and laboratory administration.

Clinical Pathology Conferences

Orientation Lectures

During their first week of CP training, all new residents receive a series of intensive "survival" lectures to familiarize them with the scope, organization, and operations of the various laboratories, and to prepare them for their rotations.

Brief Reports (Mondays - 9:00 AM) *(Updated 2011)*

This conference is a presentation and discussion of challenging consults encountered by residents on various rotations during the previous week. Three residents are asked to briefly present a consult, followed by a discussion of the clinical reasoning, evidence in support of the decision, and any anticipated follow-up. Attending physicians are invited to participate in the discussions and present consults as well.

Didactic Conference (Tuesdays, Wednesdays, and Thursdays - 8:30 AM)

Presented by the laboratory medicine and associated faculty, this conference provides the major instruction to prepare residents for their Pathology Board examinations.

Hematology Rounds (Monthly - 8:30 AM) *(Updated 2011)*

Residents completing their Hematology/Flow Cytometry rotation are asked to compile their most interesting cases during the preceding month and present them to the residents, hematopathology fellows, and attendings. Heme/Onc fellows are also invited to attend and participate in the discussion.

Clinical Case Conference (Fridays - 8:30 AM)

This is a formal presentation by the residents of a case chosen to highlight the use of laboratory data in patient diagnosis and management. This conference is presented by the residents with assistance by the faculty and is often attended by clinicians involved in the patient's care. Case Conferences are occasionally posted on the department website if they have extra teaching value.

Research Seminar (Approximately every other week)

State-of-the-art topics and research-in-progress are presented by more senior departmental faculty, other faculty in the School of Medicine or Yale University, and invited speakers from other institutions. Senior laboratory medicine residents may also present the results of their clinical or research investigations at Research Seminar.

Journal Club (Monthly)

Residents present "hot" papers on a topic of their choosing and critically evaluate / analyze the data and approach.

Specialty Intradepartmental and Interdepartmental Conferences

In addition to the general morning conferences, a number of specialty conferences are associated with specific rotations. Residents on these rotations are expected to attend those specialty conferences. Many are interdepartmental, and represent opportunities to participate directly in clinical consultative activities. These include:

Thoracic Oncology Program Tumor Board	Monday, 7:30 AM
GU Conference	Monday, biweekly, 12:00 Noon
Pediatric Intensive Care & Morbidity/Mortality Conf	3rd Monday each month, 12:00 Noon
Pediatric GI Conference	1st Monday each month, 3:00 PM
Neuro Epilepsy Conference	Monday, 3:30 PM
Head and Neck Tumor Board	Monday, 3:30 PM
Interstitial Lung Disease Conference	Monday, 4:00 PM

Liver Conference	Monday, 4:00 PM
Nephrology Biopsy Conference	2nd Monday each month, 5:00 PM
Hematopathology Conference	Tuesday, 8:30 AM
GI Tumor Board	Tuesday, 4:00 PM
Gynecologic Oncology Conference	Tuesday, 4:30 PM
Pituitary Conference	Tuesday (monthly), 5:00 PM
Neurosurgery Morbidity/Mortality Conference	Wednesday, 7:00 AM
Heart & Renal Transplant Conference	Wednesday, 9:00 AM
Pediatric Surgery Conference	2nd Wednesday each month, 10:00 AM
Liver Transplant Conference	2nd and 4th Wednesdays, 12:00 Noon
Neuropathology Teaching Conference	3rd Wednesday each month, 12:00 Noon
Brain Cutting Conference	Wednesday, 12:00 Noon (1:00 PM on 3rd Wed)
Thyroid Cytology/Histology Conference	Wednesday, 4:00 PM
Breast Conference	Wednesday, 5:00 PM
Melanoma Conference	Thursday, 7:30 AM (2 hrs)
Liver Tumor Board	Thursday, 7:30 AM
Pediatric Neurosurgery Tumor Board	Thursday, 4:00 PM
Neuromuscular Conference	Thursday, 5:00 PM
Pediatric Discharge Conference	Thursday, 5:00 PM
Endocrine Tumor Board	Friday, 7:30 AM
Sarcoma Conference	1st & 3rd Friday, 11:00 AM
Breast Radiology Correlation Conference	Friday, 12:00 Noon
Neonatal Morbidity/Mortality Conference	4th Friday each month, 12:00 Noon
GI Case Conference	Friday, 2:00 PM
Heme Fellows Conference	Friday, 1:00 PM
Neurosurgery Tumor Board	Friday, 1:00 PM

Bridgeport conferences

GI Conference	Tuesday, 12:00 PM
Breast Conference	Wednesday, 8:00 AM
Pulmonary Conference	1st Wednesday monthly, 12:00 PM
GYN Tumor Board	1st & 3nd Thursday bimonthly, 7:45 AM
Tumor Board	Friday, 12:00 PM

VA conferences

Hematopathology	Monday, 2:00 PM
Dermatopathology	Tuesday, 7:45 AM
GI Tumor Board	Wednesday, 4:00 PM
GU Tumor Board	Every other Thursday, 2:00 PM
General Tumor Board	1st and 3rd Friday, 8:15 AM
Liver Tumor Board	Every other Friday, 10:30 AM
Test-of-the-Week	Friday, 4:00 PM

Current Year Conference Schedules

The conference schedules are dynamic and subject to change throughout the year. Yahoo calendar is used to keep the residents and faculty up-to-date about the current conference schedule. This information is available via the web.

RESIDENT BENEFITS/RESOURCES

Yale-New Haven Hospital provides a uniform set of benefits for all House Staff, including an adoption assistance program, family/medical leave of absence, fertility assistance, reimbursement accounts, long term disability, group life insurance, professional liability insurance, professional leave, same-gender domestic partner coverage, tax sheltered annuity, and flexible medical benefits. These are all competitive with other Northeastern United States programs. Details of these benefits can be found on the YNHH web site.

Stipend and Performance Incentive Plan *(Updated 2011)*

For the 2011-2012 academic year, PGY-1 residents receive $54,400. There is an approximately 4-5% pay differential for each subsequent year of training.

In addition, as Yale New-Haven Hospital employees, residents who remain up-to-date with their required on-line training are eligible to participate in the hospital-wide gain-sharing program called the Performance Incentive Program (PIP). This program rewards employees annually for their contributions to the ongoing success of the hospital.

Vacation and Academic Leave *(Updated 2011)*

All residents are allowed three weeks (15 weekdays) of vacation time during each academic year. **All vacation times must be requested four weeks prior to the vacation and must be submitted to the Chief Resident and the Program Coordinator who, with the assistance of the Program Director, will approve leave if there are no conflicts with other resident vacation requests.** Clearly we cannot have a large number of residents out at the same time. Failure to comply with this policy may jeopardize approval of the vacation time requested. Religious holidays not formally recognized as institutional holidays by Yale-New Haven Hospital may be taken as vacation time.

Because residents completing their training in the program frequently have to depart a couple of days early to attend orientation at their fellowship program location, residents in their last year of training are strongly advised to take this into account when planning their vacation and should save an appropriate amount of vacation time for this possibility. Also, because the program can get short staffed at this time, residents continuing their training in our program the following year are not allowed to take vacation during the last two weeks of June.

Residents *during their last two years* of training (3rd and 4th years for AP/CP residents, 2nd and 3rd years for AP-only and CP-only residents) are allowed an additional five days of "academic leave" each year. This time may be used for attending conferences, interviewing for fellowships/jobs, attending a review course, and/or taking the Board examination. Time away from work for these

activities in excess of the five days will count as vacation time. To encourage and reward residents who present original work at national meetings, days on which a resident presents his/her own work (in the form of a poster or platform presentation) and/or days on which the resident is representing the Program as an appointed delegate to a national forum will not be deducted from the allowed days of academic leave for that year. The work being presented must have been conducted while a resident in the Program, and the resident should provide documentation of the presentation to the Program Coordinator. An additional allowance of one or two days for travel (if the meeting is not local) may also be made, at the discretion of the Program Director. Presentations/travel on weekend days does not count against the academic leave.

Unused vacation time and academic leave time does not "roll over" from year to year.

Each resident is also allowed one additional day leave at some point in their training to take Step III of the United States Licensing Examination. This one day does not count as vacation time or academic leave.

For all forms of leave, residents are expected to arrange appropriate coverage of **ALL** of their assigned service obligations, including weekend responsibilities. A copy of the Cross Coverage Form should be completed by the resident requiring coverage and must be signed by the individual(s) covering the services as an indication of their acceptance of the responsibility for these services during the period of absence. The resident providing the coverage must be qualified to do so by an equivalent level of training. This form should then be submitted to the Chief Resident. No coverage is needed for elective time, although the vacation time should be indicated on the elective form.

Sick/Medical Leave

It is the policy of the program to provide resident physicians with appropriate leave time for personal illness. Consistent with YNHH policy, residents are allowed up to 10 days sick leave per year. Periods of absence for longer than three days may require a physician's note for fitness to return to work. Recognize, however, that it is unprofessional and inappropriate to "call in sick" for reasons other than illness.

It is the responsibility of any resident who cannot attend work as scheduled to inform the Program Coordinator AND the appropriate Chief Resident of the absence DAILY, either by phone or email. This must be done even if the resident is on a rotation that does not require coverage. If the resident is on a service with active clinical cases that need attention, it is crucial that the resident work with the Chief Resident and other residents to assure non-delayed continuity of patient care.

If needed, Family/Medical Leave of Absence (FMLA) can be taken for purposes of either child adoption, care of a newborn infant, the serious illness of a child, spouse, or parent, parent-in-law, or for personal physical or mental illness or disability. A family/medical leave of absence (FMLA) may be granted for a period up to 16 weeks (26 weeks for their own personal disability) during a 24-month period. When an employee plans to take leave under this policy, the employee must give the Hospital/Department 30 days notice. If it is not possible to give 30 days notice, the employee must give as much notice as is practical and reasonable. An employee undergoing planned medical treatment is required to make a reasonable effort to schedule the treatment to minimize disruptions to the Hospital's/Medical School's operations. The leave may be paid, unpaid, or a combination. Six weeks of paid leave is given for maternity situations. Paternity leave is unpaid leave. Details of the family/medical leave policy can be found on the YNHH GME website.

Remember that the American Board of Pathology requires that residents document an average of at least 48 weeks of active training per 52-week academic year to be eligible to sit for the Board examination. Time off for sick or other medical leave and for interviews should be taken into account when planning vacation time so as not to fall below this minimum.

Interim Mentor Program *(New 2011)*

Each year for the past several years, the Program leadership and residents discussed creating a formal mentoring program for the residents, pairing each resident with a designated faculty mentor. However, each year, the residents indicate that they would prefer to identify their own mentor(s), to structure the relationship to meet their individual needs, and that they want the flexibility to have more than one mentor, or to change mentors as their interests change. Thus, they would prefer to not be assigned someone who would be their mentor for the duration of their training.

However, during the first couple of months of the first year, residents do not yet know the faculty well enough to identify an appropriate mentor themselves. Therefore, we have instituted an interim mentor program. Each incoming resident is assigned a senior faculty member (Professor or Associate Professor) to serve as an interim mentor for that resident for the first three months of his or her training. The structure of the relationship is flexible, but at the least the mentor is expected to meet with the resident twice during that three month period, with the first meeting occurring in the first three weeks of July.

The scope of the resident's interaction with his or her interim mentor is intended to include professional advice, an introduction to life in Southern Connecticut, and general tips about living and working at Yale and navigating the sometimes turbulent waters of an academic department. Issues concerning academic performance or administrative matters about the Program should generally still be addressed to the Program Director, an Associate Program Director, or Departmental Chairs, as appropriate, who are always available to address resident concerns.

The interim mentor relationship is pre-programmed to expire at the end of the first three months. Thus, neither the resident nor the faculty member should have any "bad feelings" about not continuing the relationship beyond that period. At this point, the resident is free to develop whatever type of mentoring relationship(s) they feel will be of greatest value to them.

Electives

Elective time is provided in the schedule for AP-2, AP-3, CP-2, and CP-3 residents. It is expected that residents will use this time to supplement their exposure to aspects of Anatomic and/or Clinical Pathology training not formally included in the schedule. These include additional training in dermatopathology, neuropathology, molecular diagnostics, forensic pathology, cytogenetics, or in depth training in a clinical pathology discipline. Multiple experiences can be combined into a single elective time slot, either concurrently or sequentially. In addition, elective time may be used for research. Elective plans must be approved by the Program Director or an Associate Program Director in order to receive credit. The resident should notify the Program Director, in writing, of his/her elective plans at least two weeks before the beginning of the elective month.

Off-Site Electives

In some cases, a resident may wish to enhance their education by participating in a training experience at an institution other than one with which the program has a standard training agreement. Yale-New Haven Hospital is committed to providing residents with this opportunity, but there must be full consideration of the quality of the training experience, the educational necessity of the rotation, and the accreditation and financial implications.

Away electives must be approved by the GME office, and **must involve a course of study that cannot be obtained at Yale-New Haven Hospital.** Residents in their first year of training in the program are not permitted to participate in non-standard off-site electives, and a maximum of eight weeks of away electives will be allowed over the entire course of the training.

Residents choosing to participate in an off-campus elective must submit the appropriate forms to the Chief Resident and the Program Coordinator **four months prior to the planned away elective**. These forms are available on the Program's web site. The GME Office requires **ninety days notice prior to the away elective,** and **this policy is not negotiable**. Residents planning an away elective should contact the Program Coordinator for the appropriate forms. *At the completion of the away elective, the supervisor of that elective experience is expected to write a letter to the Program Director detailing the resident's activities and evaluating their performance. The letter must include the inclusive dates of the resident's elective experience at their institution.*

Research Electives

Residents may use their elective time for research. The research should be aimed at addressing a hypothesis or learning a new diagnostic technique and must be conducted under the supervision of a faculty member. Well in advance of the elective period, the resident should meet with their planned advisor to discuss the aims, goals, and design for the experience. The resident should prepare a 2-4 page description of the proposed experience. The proposal should include the dates of the elective, daily schedule of activities, objectives of the experience, and a specific, measurable endpoint. It should also describe how this experience will enhance the residents training and therefore why it should be granted credit toward qualification for the Board examination. The resident must have the proposal reviewed and signed by the advisor, and then submit it to the Program Director for approval. *At the completion of the elective, the supervisor is expected to write a letter to the Program Director detailing the resident's activities and evaluating their performance.*

Hospital Housestaff "Book" Allowance

Each resident is provided by YNHH an annual allowance of $1400 that may be used for the purchase of books, journal subscriptions, scientific association dues, examination fees, and/or travel/lodging for meetings, courses, or extramural rotations. Original receipts are required for reimbursement. On-line purchases must be documented with a printed receipt including both the details of the purchase and the method of payment. If the credit card number does not appear on the receipt, a copy of the card statement should be provided. Items paid by check require a copy of the front and back of the canceled check. All expenses should be submitted through the Program Coordinator. If there is any question about whether a particular expense would be covered, check with the Program Coordinator before incurring the expense. Spending must be completed by the end of the hospital's fiscal year (the following September 30th); graduating residents must complete their spending by the end of their residency on June 30th. Unused amounts cannot be carried over into subsequent years.

Abstract Submission Fees

The Program will cover the cost of submission of abstracts to national professional meetings on which a resident is the first author. This is done with the understanding that if the abstract is accepted, the resident plans to attend that meeting and present that work.

Travel Allowance *(Updated 2011)*

AP-1, AP-2, and CP-1 residents who present at a conference(s) will be reimbursed up to $1000 per year (not per meeting) for travel expenses to that conference(s). Residents in their final year of training will receive a $1000 travel allowance, regardless of whether or not they present. These amounts are in addition to any portion of the Housestaff Allowance mentioned above which the resident may elect to use. One may not get reimbursed from both accounts for the same expense. Unused travel allowances may not be carried over to the following academic/fiscal year.

Residents are expected to arrange their own travel and to keep all receipts. Before making travel arrangements, please speak to the Residency Program Coordinator, who arranges reimbursement for residents. When submitting receipts for reimbursement, include your Social Security Number with the request. Original receipts (i.e., no photocopies) from all expenses, i.e., registration fees, hotel accommodations (room charges only), taxis, airfare, plus original ticket stubs and boarding passes are required for reimbursement. If your receipt is a check, a clear photocopy of the front and back of the canceled check must be presented. **University Guidelines do not allow credit card statements to serve as receipts.** University Guidelines prescribe that personal meals, while traveling, will be reimbursed at the prevailing rate for area to which the resident traveled. It is not necessary to submit meal receipts, as the per diem rate will be utilized. If expenses exceed the allowance, you will be reimbursed up to your allowance.

Graduate Medical Education Committee

Each year, two residents are selected to represent the program on the institution's Graduate Medical Education Committee. One member is elected by vote of all the residents in the program, and the second is appointed by the Program Director. GMEC members represent the interests of their fellow residents as well as take part in the policy setting activities for the institution.

Space and Computers *(Updated 2011)*

Both departments have dedicated space for the exclusive use of the residents. AP-1 residents on the autopsy service have dedicated carrel space in the Autopsy Residents' room next to the autopsy suite. This room also has four computers, a printer, a high-end photomicroscope with a digital camera, and three additional microscopes, as well as a small library and two phone lines. All residents on AP rotations have dedicated carrel space in the Surgical Pathology Residents' room. This room has four computers (in addition to the dozen in the adjacent signout space), a printer, and phones. Individual microscopes are present in the carrels. The adjacent signout area has a photomicroscope with a digital camera, a scanner/copier, and an extensive library of reference books. All residents on CP rotations have desks in the residents' room on the fourth floor of the Park Street Building. This room has four computers, a printer, and a library.

All of the resident computers include Microsoft Word, Excel, and PowerPoint. Residents will be expected to learn how to prepare and present digital conferences using PowerPoint. The conference rooms in both departments, as well as most conference rooms throughout the institution, are equipped with digital projection equipment.

To preserve and protect the privacy of patient information, residents are only to access and store patient information from/on departmental owned computers. To facilitate resident research projects, each resident is provided with a high end "flash drive" which is password protected (the resident selects the password) and is essentially indestructible. This can be used on the resident's home computer. If lost, any attempt to retrieve information from this device without knowing the password will result in erasure of the data.

email

All residents are provided with an email account for their professional use. Your email address typically will be [firstname].[lastname]@yale.edu. The University has a web-based interface to the email system, allowing you to check and send email from anywhere in the world.

Resident Social Budget

The residents are provided with a yearly "social budget" to fund a limited number of "resident-only" events (i.e., no faculty coordinators or chaperones). Use of these funds is at the discretion of the chiefs on both the anatomic pathology and clinical pathology rotations. These funds may be used for multiple small events or one more substantial event. Any events, activities, etc. funded out of this budget must be open/available to all residents. The chiefs will submit receipts for reimbursement to the Program Coordinator. Reimbursement must be approved by the Program Director, and is contingent upon the activity meeting the "approved by all chief residents" and the "open/available to all residents" requirements. Expenses exceeding the budgeted amount will not be reimbursed.

Departmental Retreats

The Department of Pathology holds a departmental retreat over a weekend during the academic year. Mini symposia on current research interests in the department will be presented and discussed. The retreat has been very successful in past years, as it allows for interaction with the faculty, postdoctoral fellows, and students doing basic research in the department. All service responsibilities will be minimized to allow as many residents as possible to participate. Of course, the autopsy service must be covered, and a senior resident will be on call for the weekend, but hopefully all on-service residents wishing to attend will be able to make arrangements for coverage.

Laboratory Medicine's yearly retreat is open to all residents. The retreat addresses only clinical and administrative issues every other year, and then the following year is devoted to research updates and presentations by laboratory medicine faculty, staff, and residents. Fellows handle call responsibilities, allowing all residents to attend.

ADDITIONAL ADMINISTRATIVE POLICIES

The Yale-New Haven Medical Center has a variety of policies related to Graduate Medical Education that apply across all residency programs. These are available for download on-line at www.ynhh.org/medstaff/grad_med.asp. Some of these policies, and some additional administrative policies, are included here below.

Resident Supervision *(Updated 2011)*

To achieve an appropriate level of competency during their training, residents must be actively involved in the procedures and interpretations that are part of the care of real patients. However, this involvement must be under an appropriate level of supervision so as not to compromise patient care, and that supervision should be graded to the level of training of the resident. All residents must be aware of their individual limitations and not attempt to provide clinical services or do procedures for which they are not trained and certified to do without supervision, except in instances of extreme urgency where such action may be life-saving.

The ACGME defines four levels of supervision for trainees:

1) **Direct supervision**: supervising physician is physically present with the resident
2) **Indirect supervision with direct supervision immediately available**: supervising physician is present within the building and immediately available to provide direct supervision
3) **Indirect supervision with direct supervision available:** supervising physician is immediately available by phone and is available to provide direct supervision as needed
4) **Oversight**: supervising physician reviews procedures/encounters and provides feedback after delivery of care

The Pathology Review Committee of the ACGME further goes on to indicate that PGY-1 residents must be directly supervised during performance of, at least, his or her three initial procedures in the following areas: autopsies, gross dissection of surgical pathology specimens by organ system, frozen sections, apheresis, and fine needle aspirations. The Pathology RC also indicates that supervision can be provided by an attending pathologist, senior resident or fellow, or pathology assistant.

The Program has created a number of forms for PGY-1 residents to document their supervision in each of these areas. These are available on the Program's web site. It is the responsibility of each resident to adhere to these restrictions, obtain the proper supervision, and document that supervision on the appropriate forms. These forms should then be provided to the Program Coordinator for inclusion in the resident's file.

Pathology residents at any level of training may, without prior certification, provide preliminary interpretations of pathologic or physiologic tests or data, but any communication of these interpretations to other clinicians or caregivers must clearly identify the interpretation as preliminary and therefore not actionable, and all interpretations must be individually reviewed by an attending pathologist before they are deemed final. Residents may address questions about appropriate usage or interpretation of routine tests and/or special procedures as they feel is supported by their knowledge base, but should clearly identify themselves as a resident and seek appropriate senior resident, fellow, or attending input as needed.

Residents may perform postmortem examinations and dissections only after having seen the procedures demonstrated by a trained technician, senior resident, or attending pathologist, and after

being directly supervised in the performance of three cases. If, in the performance of a postmortem examination, findings are uncovered which suggest that the death may have been non-natural, the resident should cease the procedure and contact the attending pathologist for further instructions.

Residents in their first year of anatomic pathology training (AP-1) may not order special procedures (immunostains, molecular pathology) during their first six months of training without first discussing this with a senior resident, fellow, or an attending pathologist.

Residents may perform gross examination and dissection of surgically removed specimens only after having had the appropriate dissection techniques for that type of specimen demonstrated to them by a trained technician, senior resident, or attending pathologist, or after having read dissection instructions specific for that type of specimen in the department's grossing manual, and after having been directly supervised in the dissection of three specimens from that organ system. Specific questions should be addressed to a pathologist assistant in the gross room or an attending pathologist.

Residents may perform fine needle aspirations only under the direct supervision of an attending pathologist or the cytology fellow, and only after having observed this procedure. A fellow may act as a supervisor only after that fellow has successfully performed a minimum of five such procedures under direct attending supervision, and has been deemed competent for a supervisory role by the attending cytopathology staff.

Residents may perform bone marrow aspirations and/or biopsy only under the direct supervision of an attending pathologist or the senior hematology fellow and only after they have observed two such procedures.

Residents may supervise apheresis procedures only under the supervision of the blood bank fellow or an attending pathologist.

Residents on overnight coverage should follow all service-specific policies concerning when to contact the on-call pathologist for any patient-care matter. In the absence of a specific policy to the contrary, the resident should contact the appropriate on-all pathologist for ALL patient care matters. All diagnostic procedures performed and evaluated during such call periods are to be reviewed by the attending prior to a definitive diagnosis being rendered.

If questions arise concerning the level of prior experience needed for a particular procedure/interpretation, contact the chief resident, Residency Program Director, one of the Associate Program Directors, or the director of the service for which the procedure/interpretation is being performed.

Duty Hours Policy *(Updated 2011)*

Duty hours are defined as clinical and academic activities related to the residency program, including patient care, administrative duties related to patient care, time spent in-house during off-hours coverage, and scheduled activities such as conferences. Duty hours do NOT include time reading/studying (regardless of where this is done) or work done away from the duty site.

Per ACGME regulations, duty hours are limited to 80 hours per week, averaged over a four-week period. Since pathology residents do not take in-house overnight call, this is rarely a problem. In addition, residents must have one day in seven free from all required responsibilities, again averaged

over a 4-week period. (Therefore, if a resident on weekend coverage has to come in to work on both Saturday and Sunday, but is only covering every other weekend, that does not constitute a violation of the one-day-in-seven off policy.) Finally, residents should routinely get a 10-hour period (and "must" get 8 hours) away from work between non-call obligations. Duty periods for PGY-1 residents are not to exceed 16 hours. See also the section on Laboratory Medicine Overnight Coverage for additional information.

All residents MUST record and document their duty hours. This is important not only for monitoring compliance with the duty hours policy but also to satisfy mandatory reporting requirements to the Center for Medicare and Medicaid Services. Currently, duty hours documentation is done using a paper form (Duty Hours and Handoff Form) available on the department's web site. One form is used for each rotation. The resident starts a new form at the beginning of the rotation, completes the handoff-evaluation portion, and then records duty hours throughout the rotation. At the completion of the rotation, the form should be turned in to the Program Coordinator. At some point during the 2011-2012 academic year, the Hospital is likely to switch to an on-line documentation system, at which point all residents in all programs will be required to use this system.

Any routine "violations" of the duty hours limits set by the ACGME should be reported to the Program Director for review.

Handoff Policy *(New 2011)*

Handoffs are defined as transitions of care, when responsibility for care of a patient is transferred from one healthcare provider to another. While handoffs are an inevitable part of any training program where residents rotate from one service to another, patient care must not be compromised during such transitions. In pathology, potential handoffs occur when responsibility for an anatomic pathology specimen transfers from one resident to another, or the laboratory workup of a complex patient transfers from one resident to another.

Following consultation with the faculty as a whole, the senior leadership of the Program met to develop methods of minimizing the impact handoffs within the program. Rotations are designed in multi-week blocks (typically four), where possible, to minimize handoffs. Autopsy cases are not handed off; responsibility for the case remains with the resident who performed the autopsy. For surgical pathology and cytology cases, transfers primarily occur when one resident is rotating off a service and another is rotating on, but can also occur when a case is transferred from one subspecialty service to another. Residents may elect to follow through on their cases until signed out, depending on the demands of the service onto which they are rotating. If they do elect to handoff incomplete cases, it is not sufficient to simply hand over the slides. The process is: a) print out (from CoPath) a list of all of your active cases (unless only one case is being transferred), b) organize the cases, c) sit with the incoming resident (or a fellow or attending if there is no incoming resident) and go through each case, discussing the status of the case, particularly any pending studies, and handing over any paperwork / slides for the cases, and d) identify which attending (outgoing or incoming) will be responsible for the case.

In Laboratory Medicine, patients undergoing complex laboratory workups can be transitioned at the end of the rotation by a verbal handoff that identifies key aspects of the workup, including: a) patient names and identifiers, b) clinical context, including any pertinent diagnoses, specific laboratories that have been involved in the management of the patients, and clinicians/clinical teams who are involved in the care of the patient, c) laboratory studies that have been performed prior to the transition, and d)

pending studies and issues that are likely to require follow up. Handoffs following weekend coverage are formalized as a Monday Morning Report to include printouts of laboratory consults encountered by the laboratory medicine resident throughout the weekend, as well as discussion among residents of the clinical context of each consult, laboratory involvement in the care of the patient, results of the consult, and any issues that may require follow up by the resident covering the pertinent laboratory service. Handoffs after a single night of coverage occur on a one-on-one basis in which the covering resident verbally signs out consults to the resident covering the pertinent laboratory service.

The ACGME also requires us to monitor the effectiveness of the handoff of cases. The effectiveness is best assessed by the person receiving the cases – did any issues arise for which they were not prepared because they did not know the status of a case? Monitoring the mechanism and effectiveness of handoffs is done using the Duty Hours and Handoff Tracking Form. The resident receiving cases should complete this portion of the form when starting a new rotation, and then continue to record their duty hours on the form. Specific problems with handoffs should also be reported verbally or by email to the Program Director or an Associate Program Director. Additionally, to monitor the effectiveness of post-weekend handoffs, during the first three nights and first weekend of coverage by incoming CP-1 residents, backup is provided by a CP-2 resident in the event of a challenging consult, and to monitor the effectiveness of the CP-1 resident at handling consults. Evaluations of the CP-1 resident will be completed by the backup CP-2 resident to ensure the CP-1 residents understand their duties and responsibilities during these coverage periods, and they show they can effectively hand off pertinent consults.

Resident Call and After Hours Coverage *(Updated 2011)*

Evening and holiday call is from 5:00 PM until 8:00 AM and weekend call is 24 hours a day, from 5:00 PM Friday until 8:00 AM Monday. All evening call in anatomic and clinical pathology is at-home call by beeper. Residents or fellows on call must be reachable either at home or by assigned beeper at all times. It is not necessary for the resident to remain in the hospital all night when they are on call. However, residents assigned to cover some services on weekends are expected to be in-house during certain hours and to come into the hospital whenever an issue requires on-site attention. Any time spent in the hospital should be recorded on the Duty Hours and Handoff Tracking Form.

All on-call residents are expected to verify that their pagers are working by paging themselves. It is also the responsibility of the on-call residents to assure that they are properly trained in any on-call responsibilities BEFORE their first day/evening of call.

Residents on-call are expected to know who the attending(s) on-call is/are, and how to reach him/her.

During the last week of each month, the page operator will be provided with a call schedule for the following month including beeper numbers and home phone numbers. It is important that any changes in call be arranged prior to this time so that an accurate schedule can be provided.

The details of resident responsibilities when covering services off-hours are listed below:

Autopsy Weekend Coverage *(Updated 2011)*

Two residents, typically AP-1 residents, are scheduled to cover the autopsy service each weekend. They cover autopsies performed at Yale-New Haven Hospital (includes both YNHH autopsies and Bridgeport Hospital autopsies) and at the VA Connecticut Healthcare System's West Haven campus.

Prior to the weekend, the covering resident should contact both the attending on-call for surgical pathology and the attending(s) on call for autopsies and reach an understanding as to how events over the weekend should be handled.

The “first call” resident is responsible for the first case EACH DAY. The “second call” resident is called in only if there is more than one case on a given day. Subsequent cases are assigned alternately to the two residents. Residents are not assigned to cover the autopsy service more than two weekends a month to assure that they have the one day in seven, averaged over the month, free from service obligations.

Residents are expected to be available to be in at work by 9:30 AM when they are covering the service. Residents should call the morgue shortly after 9:00 AM to see if there are any cases and to verify with morgue staff how they can be reached. If there is no case going on early in the morning, assigned covering residents are expected to remain available to arrive expeditiously at the hospital until 2:00 PM that afternoon. Cases for which all of the necessary paperwork is not available by 2:00 PM are routinely held over until the next day. However, in rare instances, an autopsy may need to be performed even after this “cut-off” time. The attending on call or the Director of the autopsy service will make this decision.

Surgical Pathology “Weekend Cutter”

On a rotating basis, AP-1 and AP-2 residents serve as the weekend cutter. Some of the surgeries on Friday run late, past the time of the last specimen delivery to pathology. These specimens are brought to pathology on Saturday morning. Additional specimens from Saturday surgeries may also arrive on Saturday. Finally, specimens may be dropped off from physician offices on Saturday morning. These specimens cannot be allowed to simply sit around until Monday. The same rules apply for holidays. The weekend cutter is responsible for taking care of these cases.

The weekend cutter is responsible for fully grossing in all of these specimens, to the extent to which they do not require extended fixation. In the vast majority of cases, these specimens will all be accessioned before 8AM, but may include an occasional Saturday morning case. The weekend cutter should be in by 8AM and gross specimens as long as is needed to complete the work. If they complete the grossing before the 12 noon cut-off time, they should call the OR to make sure there are no cases about to send down specimens for cutting. If there are none, the weekend cutter can leave as early as 11AM, but not earlier. It is not necessary to remain around past 12:00 noon on the outside chance that something else might show up.

One of the histotechnologists in from 7-11 AM will be assigned to wait until the weekend cutter finishes grossing the specimens received before noon, and will take responsibility for loading those cassettes on the processor. On many occasions, this may all be completed by 11AM, so no additional time will be needed. However, there will typically be the need for this person to stay until about 12 or even 1 when the resident finishes cutting. As a courtesy, the weekend cutter should be conscious of the fact that they are keeping someone from going home. The weekend cutter should cut continuously until the cutting is complete, and not wander off for lunch with the plan to come back and finish later, all the while keeping the histotech from going home.

Any specimens which arrive after 12 noon or which arrive after the weekend cutter has appropriately discharged his/her duties and has left become the responsibility of the senior on call resident. This responsibility involves "stabilizing" the specimen (placing in formalin, perhaps pinning out) but not fully grossing in the specimen unless there is a medical indication that requires special handling.

On official YNHH holidays, the clinics, physician offices, and ORs are closed, so there is no regular specimen drop-off. Also, on those days, no histology staff is available to accession the cases or load the cassettes into the processor. Therefore, if the holiday day is contiguous with a weekend, the resident on weekend cutter duty will only have to come in on the Saturday, not the contiguous holiday.

Surgical Pathology Weekday Evening Call

The AP-3 resident or fellow on the frozen section rotation is automatically the resident on call Monday through Thursday evening. The on-call resident should check with the operating room before going home to see if there are any surgeries still in progress which may require a frozen section. Any rush biopsies which come out after 5:00 PM, or other pending clinical issues, are also the responsibility of the senior resident/fellow on-call.

Any emergency specimens or other "new" specimens that arrive after hours MUST be accessioned into CoPath before they are processed. The CAP specifically requires that all specimens must be given a unique accession number when received in the lab. Failure to do so could result in the tissue or slides being later associated with the wrong case.

Surgical Pathology Weekend Call

Weekend call begins at 5:00 PM on Friday and continues until 8:00 AM Monday. After 5:00 PM Friday, all on-going and add-on surgery cases, rush biopsies, or other pending clinical issues are the responsibility of the on-call senior resident or fellow, recognizing there may be professional-based reasons for patient care issues in which it is appropriate for the day frozen section resident to continue a case past 5:00 pm.

On Friday afternoon, the on-call resident/fellow should contact the AP-1 residents scheduled to cover the autopsy service over the weekend, the attending(s) for autopsy (to determine whether or not they want to be called for every case), the Saturday grossing resident (who might need supervision), and the on-call attending for surgical pathology (beeper number, home phone number, type of cases for which he should be called). The on-call resident/fellow should also determine who the histotechnologist on call is and how they can be reached. If there have been any changes in the posted monthly on-call schedule, contact the hospital page operator (203 688-3111) to be sure they know you are on-call and have your correct beeper number.

On Saturday, the person on-call is expected to cover the Hot-Seat phone from 9:00 AM until 1:00 PM, during which time all biopsies from the previous day should be read and necessary phone calls made.

On both Saturday and Sunday, the person on-call should be available, as needed, to provide advice and/or technical assistance to the residents covering the autopsy service. This includes autopsies at the VA hospital. Call the morgue at approximately 9:15 AM each day to check on the status of that service.

As with specimens that arrive late on weekdays, any emergency specimens or other "new" specimens that arrive on weekends MUST be accessioned into CoPath before they are processed.

On Monday morning, any case related issues from the weekend have to be followed up or appropriately transferred to another resident/fellow. If current service duties permit, the on-call person should attend the presentation of weekend autopsy cases. Otherwise, contact the AP-3 resident on the autopsy service and discuss any pertinent issues with them so that they can properly follow up on the case.

Laboratory Medicine After Hours Coverage *(Updated 2011)*

Residents are strongly encouraged to develop their skills as a CP consultant and thus have certain responsibilities besides the laboratory rotations. The most important of these is handling general evening and weekend issues for all of the laboratories and blood bank, which is rotated among all residents currently on CP rotations. This results in coverage approximately one night each 7-9 weekdays, and approximately one weekend each month. The covering resident is responsible for emergency consultations and problem-solving for all of the labs at Yale, the VA Hospital, and the Shoreline Medical Center from 5 PM to 8 AM on weekdays and from 5 PM on Friday to 8 AM on Monday during weekends. This usually entails staying in the laboratories until 6-7PM on weekdays or from about 8 AM to 3 PM on weekends, after which coverage of the laboratories is accomplished from home. Nearly all problems are handled by telephone, but we encourage, if applicable, our residents be visible on the wards to facilitate their training and their comfort level as consultants. Backup is available at all times from the chief resident, laboratory medicine fellows, and the laboratory medical directors, as well as initially from an assigned CP-2 resident (as described above).

A pool of on-call pagers is located in the resident room in laboratory medicine. It is the responsibility of the covering resident to acquire one of these pagers and have it on at all times during the period when they are covering the clinical laboratories. You must also carry your own personal beeper (the one assigned to you at the beginning of the year). The reason for this is that if the coverage beeper malfunctions or is lost, an alternate means exists for someone to get in touch with you. The program has provided a coverage laptop with complete system access so that all information may be obtained while offsite in a HIPAA compliant mode.

Between 5 – 6 PM, all of the residents in the core lab rotations should contact the covering resident to signout any active or problematic cases. This is particularly true for the Blood Bank and VA rotations, which often have patients that require attention after the regular work day has ended.

After covering the laboratories during the evening/night period, if there are any active cases remaining, it is your responsibility to sign them out to the resident covering that laboratory during the regular work day. This is normally done between 8:00-8:30 AM, prior to the morning's didactic session. In the event that evening/night coverage was very taxing and did not allow the resident an appropriate period of rest and reasonable personal time, especially if the resident was required to return to the hospital for a significant time as part of a consult, that resident is excused from their clinical responsibilities during the following work day, or they can elect to have their schedule adjusted (late arrival, early dismissal, etc.) such that they are able to achieve an appropriate rest period. This will be expedited by the chief resident who will communicate to the appropriate labs and to the Associate Program Director, Dr. Rinder. However, sign-out of cases is expected to occur after every evening/night coverage period, regardless of whether that resident is excused from their other work duties. Following weekend coverage, the resident is responsible for presenting cases at the Monday Morning Report.

Resident - Attending Compact

The Graduate Medical Education Committee for Yale-New Haven Hospital has drafted the following compact representing an implicit agreement that applies to residents and teaching faculty in all of the institution's residency programs.

Compact Between Resident/Fellow Physicians and Their Teachers

The "Compact Between Resident and Fellow Physicians and Their Teachers" is a declaration of the fundamental principles of graduate medical education (GME) and the major commitments of both residents/fellows and faculty to the educational process, to each other and to the patients they serve.

Preamble

Residency/fellowship is an integral component of the formal education of physicians. In order to practice medicine independently, physicians must receive a medical degree and complete a supervised period of residency training in a specialty area. To meet their educational goals, resident/fellow physicians must participate actively in the care of patients and must assume progressively more responsibility for that care as they advance through their training. In supervising resident/fellow education, faculty must ensure that trainees acquire the knowledge and special skills of their respective disciplines while adhering to the highest standards of quality and safety in the delivery of patient care services. In addition, faculty are charged with nurturing those values and behaviors that strengthen the doctor-patient relationship and that sustain the profession of medicine as an ethical enterprise.

Core Tenets of Residency/Fellowship Education

Excellence in Medical Education

Institutional sponsors of residency/fellowship programs and program faculty must be committed to maintaining high standards of educational quality. Resident/fellow physicians are first and foremost learners. Accordingly, a resident's/fellow's educational needs should be the primary determinant of any assigned patient care services. Residents/fellows must, however, remain mindful of their oath as physicians and recognize that their responsibilities to their patients always take priority over purely educational considerations.

Highest Quality Patient Care and Safety

Preparing future physicians to meet patients' expectations for optimal care requires that they learn in clinical settings epitomizing the highest standards of medical practice. Indeed, the primary obligation of institutions and individuals providing resident/fellow education is the provision of high quality, safe patient care. By allowing resident physicians to participate in the care of their patients, faculty accept an obligation to ensure high quality medical care in all learning environments.

Respect for Residents'/Fellows' Well-Being

Fundamental to the ethic of medicine is respect for every individual. In keeping with their status as trainees, resident/fellow physicians are especially vulnerable and their well-being must be accorded the highest priority. Given the uncommon stresses inherent in fulfilling the demands of their training program, residents/fellows must be allowed sufficient opportunities to meet personal and family obligations, to pursue recreational activities, and to obtain adequate rest.

Commitments of Faculty

1. As role models for our residents/fellows, we will maintain the highest standards of care, respect the needs and expectations of patients, embrace the contributions of all members of the healthcare team ***and exemplify the professional values of honesty, compassion, integrity, and dependability***.
2. We pledge our utmost effort to ensure that all components of the educational program for resident/fellow physicians are of high quality, including our own contributions as teachers.
3. In fulfilling our responsibility to nurture both the intellectual and the personal development of residents/fellows, we commit to fostering academic excellence, ***in part by encouraging participation in clinical and/or basic research***, exemplary professionalism, cultural sensitivity, and a commitment to maintaining competence through life-long learning.
4. We will demonstrate respect for all residents/fellows as individuals, without regard to gender, race, national origin, religion, disability or sexual orientation. ***Abuse or harassment must not be tolerated in any way, whether it be physical, verbal, emotional or sexual in nature; we will cultivate a culture of tolerance among the entire staff.***
5. We will do our utmost to ensure that resident/fellow physicians have opportunities to participate in patient care activities of sufficient variety and with sufficient frequency to achieve the competencies required by their chosen discipline. We also will do our utmost to ensure that residents/fellows are not assigned excessive clinical responsibilities and are not overburdened with services of little or no educational value. ***In particular, we embrace the values inherent to the ACGME work-hour rules and will foster an atmosphere consistent with those values.***
6. We will provide resident/fellow physicians with opportunities to exercise graded, progressive responsibility for the care of patients, so that they can learn how to practice their specialty and recognize when, and under what circumstances, they should seek assistance from colleagues. We will do our utmost to prepare residents to function effectively as members of healthcare teams.

7. In fulfilling the essential responsibility we have to our patients, we will ensure that residents/fellows receive appropriate supervision for all of the care they provide during their training.
8. We will evaluate each resident's/fellow's performance on a regular basis, provide appropriate verbal and written feedback, and document achievement of the competencies required to meet all educational objectives.
9. We will ensure that resident/fellow physicians have opportunities to partake in required conferences, seminars and other non-patient care learning experiences and that they have sufficient time to pursue the independent, self-directed learning essential for acquiring the knowledge, skills, attitudes, and behaviors required for practice.
10. We will nurture and support residents/fellows in their role as teachers of other residents and of medical students, ***in part by providing an example of clinical educator and demonstrating a commitment to life-long learning.***

Commitments of Residents/Fellows

1. We acknowledge our fundamental obligation as physicians ***under supervision***—to place our patients' welfare uppermost; quality health care and patient safety will always be our prime objectives.
2. We pledge our utmost effort to acquire the knowledge, clinical skills, attitudes and behaviors required to fulfill all objectives of the educational program and to achieve the competencies deemed appropriate for our chosen discipline.
3. We embrace the professional values of honesty, compassion, integrity, and dependability.
4. We will adhere to the highest standards of the medical profession and pledge to conduct ourselves accordingly in all of our interactions. We will demonstrate respect for all patients and members of the health care team without regard to gender, race, national origin, religion, economic status, disability or sexual orientation***—cultivating a culture of tolerance among the entire staff.***
5. As physicians in training, we learn most from being involved in the direct care of patients and from the guidance of faculty and other members of the healthcare team. ***Since our attending physicians bear final responsibility for the care of our patients, we must learn from their experience, keep them informed, faithfully execute their plans, and document their involvement in care.***
6. We accept our obligation to secure direct assistance from faculty or appropriately experienced residents whenever we are confronted with high-risk situations or with clinical decisions that exceed our confidence or skill to handle alone.
7. We welcome candid and constructive feedback from faculty and all others who observe our performance, recognizing that objective assessments are indispensable guides to improving our skills as physicians.
8. We also will provide candid and constructive feedback on the performance of our fellow residents/fellows, of students, and of faculty, recognizing our life-long obligation as physicians to participate in peer evaluation and quality improvement.
9. We recognize the rapid pace of change in medical knowledge and the consequent need to prepare ourselves to maintain our expertise and competency throughout our professional lifetimes.
10. In fulfilling our own obligations as professionals, we pledge to assist both medical students and fellow residents in meeting their professional obligations by serving as their teachers and role models.

This compact serves both as a pledge and as a reminder to resident physicians and their teachers that their conduct in fulfilling their obligations to one another is the medium through which the profession perpetuates its standards and inculcates its ethical values.

Resident "Dress Code"

A subcommittee of the Graduate Medical Education Committee for Yale-New Haven Hospital has drafted the following guidelines for appropriate resident attire while at work, and this has been approved by the GMEC and senior hospital leadership, effective January 1, 2010.

Introduction:

The Graduate Medical Education Training Programs of the Yale-New Haven Medical Center are committed to the highest standards of professionalism and professional image to all persons, agencies and associations. This foremost includes our patients, their families and other visitors. We believe that professionalism and the image we present inspires confidence in the care and services we provide as professionals and as an institution.

We expect that trainees must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles, including:

(1) compassion, integrity, and respect for others;
(2) responsiveness to patient needs that supersedes self-interest;
(3) respect for patient privacy and autonomy;
(4) accountability to patients, society and the profession; and,
(5) sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;
(6) a safe, comfortable and healthy work environment;

(7) presenting a professional and identifiable appearance to patients, their families and visitors, YNHH staff, and the medical and business communities;
(8) supporting a culture of confidence and service excellence while at the same time, accommodating sincerely held religious and cultural beliefs when operationally feasible.

In order to promote the professional image, the following standards of appearance are put into place.

Scope:

This policy applies to all residents/fellows at Yale-New Haven Medical Center.

Individual program directors have the discretion to define appropriate attire for the work environment and the nature of the work performed within the scope of this policy.

Policy:

1. General Appearance

In all circumstances, professionalism and appropriateness are the guiding standards. Extremes of fashion in clothing, hair styles and accessories must be avoided, as well as any clothing or adornment that detracts from the trainees' roles and responsibilities.

2. Identification
   a. All residents/fellows must wear their identification badges with the photo plainly visible above the waist when in patient care areas.
   b. A lab coat with name will not replace the use of a name badge
   c. Name badges should be clipped on and lanyards should not be used in areas and roles that necessitate patient contact
   d. Personal statements expressed by symbols, messages or insignia must be appropriate and consistent with our mission and patient satisfaction goals. This includes personal statements reflected on clothing, accessories, pins, buttons, stickers, fabric patterns and non-YNHH/YSM logo wear.

3. Grooming and Hygiene
   a. All residents/fellows will maintain reasonable personal hygiene and grooming standards essential to a professional image.
   b. Scents of any kind (perfumes, lotions, hair products, etc) must be used sparingly and are not permitted where there is sensitivity to fragrances.
   c. Cosmetics should be used in moderation.
   d. Hair must be clean and neat and worn off the face when working with patients or as required for safety and sanitation.
   e. Facial hair and fingernails must be clean and trimmed according to applicable health standards and Hospital policies. For additional information, please refer to the Fingernails, Natural and Artificial C: F-1 in the Administrative Policies and Procedures Manual.

4. Jewelry and Accessories
   a. Jewelry must be discreet and appropriate, and not cause a safety or infection control hazard. Earrings must be small and unobtrusive, and not detract from the professional image or represent a safety risk.
   b. Visible body piercings (other than earrings) are prohibited.
   c. Tongue piercings can impact communications and are therefore prohibited.
   d. Tattoos and body art that are considered offensive, sexually explicit, racist or threatening must be covered.
   e. Authorized head coverings, i.e. surgical caps, may be worn correctly and as appropriate to the task and work environment.

5. Professional Dress:
   a. When residents are not required to wear scrubs, their dress must be professional.
      i. For men this includes: collared shirts (dress shirts, button downs), turtlenecks or sweaters (including cardigans), tailored trousers (dress slacks, khakis, corduroys) and loafers or laceup shoes with socks. Blazers and sports jackets are optional.
      ii. For women this includes: shirts (collared) or blouses with sleeves, turtlenecks, sweaters and sweater sets, skirts or tailored pants, and flats, pumps or boots.
      iii. It is understood that when residents/fellows are asked to return to the hospital at night, in an emergency, the above requirements may be relaxed as arriving for patient care is the first priority.
   b. Inappropriate attire includes: denim, shorts, tee shirts (sleeveless shirts, tank tops, halter tops, crop tops), sandals (beach sandals, Birkenstocks, flip flops), athletic wear of any kind (sweatshirts, rugby shirts, sweatpants, leggings, stirrup pants, jogging suits, spandex, lycra, caps), torn clothing (clothing with holes or frayed ends), and provocative or revealing clothing.

c. Clothing when on night call may include heavier upper garments, including fleece jackets/vest/sweatshirts, if clean, neat and in good repair without hoods.
d. Clothing must be clean, neat and in a good state of repair.
e. Clothing must cover the shoulders and midriff.
f. Undergarments:
    i. Undergarments must be worn under clothes and must not be distinguishable through attire
g. Ties:
    i. Neck ties may be worn. In roles that require direct patient contact neck ties must be clipped or worn with a buttoned white lab coat or suit coat, so as to prevent transmission of infection.
h. Lab Coats:
    i. A clean, neatly pressed, white lab coat should be worn.
i. Footwear/Shoes:
    i. Shoes worn by direct patient care residents must be clean, well kept and should have an enclosed toe.
    ii. Athletic or walking shoes (sneakers) may be worn, but must be plain and clean.

6. Scrubs:
    a. Direct patient care employees will wear scrubs as designated by their role and their department.
    b. Scrubs must be neat, wrinkle free and clean.
    c. Soiled scrubs need to be changed immediately.
    d. Scrubs should not be worn outside of the workplace, with the exception of transport to and from the hospital.
    e. Midriff must be covered.
    f. Clean, neat T shirts without logos or turtle necks can be worn under scrub tops but not in the place of scrub tops.

Accountability:

Every resident/fellow has the responsibility of being fit for duty within the core competency of professionalism. As such, it is expected that each resident/fellow will hold one another accountable. Residents/fellows who report for duty in unacceptable attire, improper grooming or uniform, may be sent home by a supervising resident/fellow, a Chief Resident or an attending. If sent home, they must return to duty in a timely manner. After counseling, continued violations of this policy will result in progressive discipline including written notice of failure to achieve competency in professionalism and possible probation, suspension or dismissal from the training program.

Reasonable accommodations based on religion and/or cultural observances or practices such as, but not limited to, style of dress, head coverings, grooming requirements will be considered on a case-by-case basis.

On the Job Injuries

Any resident who sustains an injury while on service **must** report the injury to your supervisor and seek medical care immediately. If the injury is not life threatening, the resident should report to Occupational Health (if rotating at YNHH). Occupational Health is staffed from 7:30 am until 4:30 pm each weekday. If the injury occurs outside of these hours, or is emergent, please report to the Yale-New Haven Hospital Emergency Room. Complete an accident report within 24 hours of the injury. Give the accident report to the Residency Program Coordinator.

For injuries which occur at the VA, report the injury immediately to your supervisor, who will complete the appropriate forms. On-site emergent medical care is available from the Employee Health Unit (EHU).

At Bridgeport Hospital, any occupational incident, no matter how slight, must be reported to the Employee Health Service/Industrial Medical Center (EHS/IMC). There, emergency treatment is available, and appropriate documentation of the incident will occur.

Required On-Line Training

All residents are required to complete a series of on-line training courses. Many of these only need to be taken once, but several have to be taken each year. The topics are broad and include such things as

Bloodborne Pathogens Training, Corporate Compliance, Ergonomics, Electrical Safety, HIPAA, and Transmission Precautions training.

These courses are provided through the YNHH Healthstream system. To access the system, go to any internet-connected computer, open a web browser, and go to www.cmecourses.com/ynhh. You will be asked to log in using your user ID and password. Your user ID is your employee number, which can be found on your pay stub. Your password is the last four digits of your social security number. Click on the "My Account" tab and the "My Courses" sub-tab. Required courses will be listed. Some courses offer a pre-course assessment. If you score >80% on the pre-assessment test, you don't have to take the course. Otherwise…

Failure to complete required on-line training may result in suspension of your pay.

House Staff Meetings *(Updated 2011)*

There are monthly house staff lunch meetings run by the Program Director and attended by the Associate Directors. This conference is a forum for communicating important recent developments and discussing issues related to the training program or clinical operations. Residents are strongly encouraged to make every effort to attend so as not to miss out on important information. If a resident has a particular issue they would like to have discussed, but does not feel comfortable bringing it up at the meeting, communicate this issue to one of the Chief Residents before the meeting, and they will bring it up anonymously on your behalf. Minutes are recorded and kept on file by the Residency Program Coordinator.

Resident Portfolios

All residents are expected to maintain a "portfolio" on a form provided by the Program. This will document the progress of the resident's training, professional development, teaching and administrative activities, and promote a self-evaluation process. Each resident should treat this as a dynamic form, and update it throughout their training. Having all of this information in one place will greatly facilitate the process of preparing applications for the Board Examination as well as assembling a Curriculum Vitae. Residents will be expected to provide an updated portfolio to the Program Director prior to the individual semi-annual progress review meetings. The completed portfolio will remain a permanent part of the resident's file.

Resident In Service Examination

Every year, during the first two weeks of May, a Resident In Service Exam (RISE) is administered. The exam is now taken on line, utilizing an "honor system" approach. **Every resident in the Pathology Residency Program is required to take this exam.** The RISE provides objective data regarding each individual resident's progress, as well as gauging the Program's efficacy. The Program covers the cost of this exam. For these reasons, all residents are expected to take the RISE annually, and only extreme circumstances will be deemed acceptable excuses for missing the RISE. Failure to take the RISE will require the resident to submit a written explanation to the Program Director and may result in disciplinary action.

Moonlighting Policy *(Updated 2011)*

Any resident who wishes to moonlight must meet with the Director of the Program and obtain written approval prior to beginning any moonlighting activities. This approval will be placed in the resident's file. All moonlighting work counts toward the 80-hour work week limit. The Program Director must be aware of all moonlighting work as well as the moonlighting schedule, and will monitor the resident's performance for any adverse effects that may be attributable to the moonlighting activities. Any adverse effects on performance may require abrupt termination of the moonlighting activity. Residents are not allowed to bill for professional services provided during normal work hours and that fall within the scope of the training program. YNHH does not provide any liability coverage for residents while they are moonlighting.

Residents on J-1 visas are not permitted to moonlight, as established by Federal Regulations 22CFR 514.16. Residents on H-1B visas may only moonlight within the Institution that supports the visa. PGY-1 residents may not moonlight.

Toll Authorization Numbers

Each resident will be provided with a Toll Authorization Number (TAN) that will allow you to place long-distance phone calls from University and Hospital phones. TANs are issued individually, and are to remain confidential and be used exclusively by the person to whom they are assigned.

TANs are to be used only to place calls that are concerned with obtaining or conveying data relevant to Hospital business or to the well being of its patients. No other categories of calls are authorized. Unauthorized use of Hospital telephone privileges may result in disciplinary action. Residents are required to use a personal cellular telephone or a calling card when making personal calls.

If you have reason to believe that someone has acquired your TAN, notify the Program Coordinator immediately to have that TAN number deactivated and a new one assigned.

Grievance Policy

The Yale-New Haven Medical Center has a Grievance Policy which applies to all of its graduate clinical training programs. The policy is intended to address those situations in which a house officer may have a disagreement with an action taken or treatment received within their program. In brief, if a resident is unable to resolve his/her problem by discussions with chief residents, the Program Director, and/or their Chiefs of Service (department chair), a written statement should be submitted to the Graduate Medical Education coordinator who will forward it to the chair of the Graduate Medical Education Committee. As needed, a Grievance Panel consisting of chief residents, program directors, clinical chiefs, and administrative officials will be assembled to review the grievance, meet with relevant parties, and recommend an action. The full details of this policy are available from the YNHH Graduate Medical Education web site.

Faculty and Staff

Administrative Appointments / Directorships / Managers *(Updated 2011)*

Director, Residency Training Program	John Sinard
Associate Director, Residency Training Program (AP)	G. Kenneth Haines
Associate Director, Residency Training Program (CP)	Henry Rinder
Residency Program Coordinator	Debra Wycoff
Chief Residents (AP)	Jaroslaw (Jarek) Jedrych
	Alexa Siddon
Chief Resident (CP)	Alex Ryder

Department of Pathology

Chair and Chief of Service	Jon Morrow
Vice Chair of Clinical Affairs and Director of Anatomic Path	Brian West
Director, Autopsy Service	John Sinard
Director, Cytology	David Chhieng
Director, Endocrine/Head & Neck Pathology Program	Manju Prasad
Director, Gastrointestinal and Liver Pathology Program	Dhanpat Jain
Director, Hematopathology Program	David Hudnall
Director, Medical Renal Pathology Program	Gilbert Moeckel
Director, Musculoskeletal Tumor Program	Jose Costa
Director, Neuropathology Program	Alexander Vortmeyer
Director, Ophthalmic Pathology Program	John Sinard
Director, Thoracic/Genitourinary/Miscellaneous Program	Kenneth Haines
Director, Women's Health and Pathology Program	Fattaneh Tavassoli
Director, Anatomic Pathology, VA Connecticut Healthcare	Robert Homer
Interim Chair, Bridgeport Hospital Pathology	Paul Cohen
Director, Surgical Pathology, Bridgeport Hospital	Vinita Parkash
Director, Clinical Laboratories, Bridgeport Hospital	Young Choi
Director, Pathology Outreach	David Chhieng
Director of Laboratories, Yale University School of Medicine	Michael Kashgarian
Director, Histology Laboratory	Brian West
Director, Immunohistochemistry Laboratory	Manju Prasad
Director, Electron Microscopy Laboratory	Gilbert Moeckel
Director, Molecular Diagnostics Program and Laboratory	Jeffrey Sklar
Clinical Director, Molecular Diagnostics Laboratory	Pei Hui
Clinical Director, Tumor Profiling Laboratory	Zenta Walther
Director, Molecular Virology Program	John Rose
Director, Pathology Informatics	John Sinard
Associate Director, Pathology Informatics	Peter Gershkovich
Director, Yale Pathology Tissue Services	David Rimm
Medical Director, Tissue Procurement / Research Histology	Alexander Vortmeyer
Director, Medical Studies	David Rimm
Course Director, Pathology 100	Robert Homer
Course Director, Pathology 200 / Pathology Modules	Constantine Theoharis

Director, Medical Student Electives	Kenneth Haines
Director, Graduate Studies	Gerald Shadel
Director, Physician Associate Studies	Earl Glusac
Vice Chair of Finance and Clinical Administrator	David Wooster
Clinical Quality Improvement Manager	Andrea J. Viray
Manager, Autopsy Service	Arthur Belanger
Manager, Cytology	Kevin Schofield
Manager, Report Generation Unit	Rachel Leftridge
Manager, Gross Room	Lori Marini
Manager, Histology and Immunohistochemistry Laboratory	Cynthia DeRiso
QA/QC Manager, Immunohistochemistry Laboratory	Mary Helie
Manager, Electron Microscopy Laboratory	Margaret Ianniello
Manager, Molecular Diagnostics Laboratory	Monica Talmor
Manager, Clinical Information Systems	Brian Daley
Manager, ITS User Services; Graphics and Imaging	Katie Henderson
Manager, ITS Infrastructure	Janos Lobb
Technical Director, Tissue Procurement	Yalai Bai
Technical Director, Research Histology	Lori Charette

Department of Laboratory Medicine

Chair and Chief of Service	Brian Smith
Vice Chair	Marie Landry
Associate Chair for Clinical Affairs (Therapeutic)	Edward Snyder
Associate Chair for Clinical Affairs (Diagnostic)	Henry Rinder
Associate Chair for Research	Paula Kavathas
Director of Medical Studies	Marie Landry
Director, Blood Bank	Edward Snyder
Associate Director, Blood Bank	Yan Yun Wu
Associate Director, Blood Bank	Mark Shlomchik
Associate Director, Blood Bank	Diane Krause
Director, Clinical Chemistry Laboratory	John McClaskey
Associate Director, Clinical Chemistry Laboratory	Michael Hodsdon
Assistant Director, Clinical Chemistry Laboratory	Tore Eid
Assistant Director, Clinical Chemistry Laboratory	Herbert Malkus
Director, Hematology Laboratories	Henry Rinder
Assistant Director, Hematology Laboratories	Richard Torres
Director, Coagulation Laboratory	Henry Rinder
Director, Immunology/Flow Cytometry Laboratory	Brian Smith
Assistant Director, Immunology/Flow Cytometry Laboratory	Stephanie Eisenbarth
Assistant Director, Immunology/Flow Cytometry Laboratory	Lesley Devine
Acting Director, Clinical Microbiology Laboratory	David Peaper
Associate Director, Clinical Microbiology Laboratory	Sheldon Campbell
Assistant Director, Clinical Microbiology Laboratory	Thomas Murray
Director, Virology Laboratory	Marie Landry
Director, Molecular Diagnostics Laboratory	J. Greg Howe
Associate Director, Molecular Diagnostics Laboratory	Sandy Chang
Director, Pheresis/Transfusion Service	Edward Snyder
Associate Director, Pheresis/Transfusion Service	Yan Yun Wu

Director, Cell Therapy Laboratory	Diane Krause
Director, Computer Operations	Rodion Rathbone
Director, Satellite Laboratories	Henry Rinder
Director, Point of Care	Peter Jatlow
Director, Outreach	Brian Smith
Director, YUSM Immune Monitoring Laboratory	Lesley Devine
Director, YUSM In Vivo Microscopy	Ann Haberman
Director, YUSM Flow Cytometry	Mark Shlomchik
Director, YUSM Cell Therapy	Diane Krause
Chief of Pathology and Lab Medicine, VA CT Healthcare	Gary Stack
Director of Laboratories, VA Connecticut Healthcare System	Sheldon Campbell
Assistant Director of Laboratories, VA CT Healthcare	Christopher Tormey
Director of Laboratory Services, YNHH	Peter Marone
Administrator, Department of Laboratory Medicine, YUSM	Ruth Cooper
Patient Services Manager, Apheresis Laboratory	Bill Hoffman
Manager, Blood Bank	TBA
Manager, Clinical Microbiology	Dana Towle
Manager, Clinical Virology	David Ferguson
Manager, Prenatal Testing and External Laboratories	Donna Scarano
Manager, Chemistry	Voula Golfis
Manager, Hematology	Edmund Sullivan
Manager, Immunology, Flow, Molecular Diagnostics	Teodorico Lee
Manager, Computer Operations	Helen Schweidler
Manager, Outreach	Deborah Anthony
Manager, Laboratory Specimen Processing	Meeok Chan

Faculty, Department of Pathology *(Updated 2011)*

Faculty	Rank	Specialty Interests
Adebowale Adeniran, MD	Assistant Professor	Cytology, GU Pathology
Seema Agarwal, PhD	Assoc Research Scientist	Experimental Pathology
Ronald Albright, PhD	Assoc Research Scientist	Experimental Pathology
Yalai Bai, PhD	Assoc Research Scientist	Experimental Pathology
Yunhua Bao, MD	Assoc Research Scientist	Experimental Pathology
Veerle Bossuyt, MD	Assistant Professor	Gyn Pathology / Breast Pathology
Demetrios Braddock, MD, PhD	Associate Professor	Structural Biology, Hematopath
Natalia Buza, MD	Assistant Professor	Gyn Pathology / Breast Pathology
Guoping Cai, MD	Assistant Professor	Cytology, Surgical Pathology
Robert Camp, MD, PhD	Assoc Research Scientist	Experimental Pathology, Autopsy
Anasuya Chattopadhyay, PhD	Assoc Research Scientist	Experimental Pathology
Dong Chen, MD	Assoc Research Scientist	Experimental Pathology
David Chhieng, MD	Professor	Cytology, Outreach
Young Choi, MD	Professor	Clinical Labs (Bridgeport)
Carol Cianci, PhD	Assoc Research Scientist	Experimental Pathology
Paul Cohen, MD	Assistant Professor	General Pathology (Bridgeport)
José Costa, MD	Professor	Bone/Soft Tiss Path, Molecular Diag
Gustave Davis, MD	Clinical Professor	Experimental Pathology
Akosua Domfeh, MD	Assistant Professor	General Pathology (Bridgeport)

Steve Downing, MD	Professor Emeritus	Cardiac Pathology, Autopsy
Anthony D'Souza, PhD	Assoc Research Scientist	Experimental Pathology
Peter Gershkovich, MD, MHA	Assoc Research Scientist	Informatics
Joanna Gibson, MD	Assistant Professor	GI Pathology
James Gill, MD	Assistant Clinical Prof	Forensic Pathology
Maureen Gilmore-Hebert, PhD	Assoc Research Scientist	Experimental Pathology
Earl Glusac, MD	Professor	Dermatopathology
Bonnie Gould Rothberg, MD,PhD	Assoc Research Scientist	Experimental Pathology
G. Kenneth Haines III, MD	Associate Professor	General and GU Surgical Pathology
Liming Hao, MD	Associate Professor	GI & General Path (Bridgeport)
Malini Harigopal, MD	Assistant Professor	Cytopathology
Yun He, PhD	Assoc Research Scientist	Experimental Pathology
Robert Homer, MD, PhD	Professor	Pulmonary Pathology, Autopsy
Qunhau Huang, PhD	Assoc Research Scientist	Experimental Pathology
Xudong Huang, PhD	Assoc Research Scientist	Experimental Pathology
S. David Hudnall, MD	Professor	Hematopathology
Pei Hui, MD, PhD	Associate Professor	Molecular Pathology / Gyn Path
Anita Huttner, MD, PhD	Assistant Professor	Neuropathology
Dhanpat Jain, MD	Associate Professor	GI Pathology
Anitha Kamath, MD	Assistant Clinical Prof	Molecular Pathology
Michael Kashgarian, MD, PhD	Professor Emeritus	Renal Pathology / EM, Autopsy
Barton Kenney, MD	Assistant Professor	General Path (VA) / GI Pathology
Sihem Khelifa, MD	Assistant Professor	Gyn Pathology / Breast Pathology
Jung Kim, MD	Professor Emeritus	Neuropathology
Steven Kleinstein, PhD	Assistant Professor	Informatics
Yuval Kluger, PhD	Assistant Professor	Informatics
Diane Kowalski, MD	Associate Professor	Cytology / Head and Neck Path
Michael Krauthammer MD,PhD	Associate Professor	Informatics
Themis Kyriakides, PhD	Associate Professor	Experimental Pathology
Sabine Lang, PhD	Assoc Research Scientist	Experimental Pathology
Angilique Levi, MD	Assistant Professor	Cytology / GU Pathology
Jie Li, MD, PhD	Research Scientist	Experimental Pathology
Qi Li, PhD	Assoc Research Scientist	Experimental Pathology
Zhongzhi Liu, PhD	Assoc Research Scientist	Experimental Pathology
Paul Lizardi, PhD	Professor	Experimental Pathology
Xian-Yong Ma, PhD	Assoc Research Scientist	Experimental Pathology
Aruna Madan, MD	Assoc Research Scientist	Experimental Pathology
Joseph Madri, MD, PhD	Professor	Experimental Pathology, Autopsy
Vincent Marchesi, MD, PhD	Professor	Experimental Pathology
Robert Means, PhD	Associate Professor	Experimental Pathology
Wang Min, PhD	Associate Professor	Experimental Pathology
Kisha Anne Mitchell, MD	Assistant Professor	GI Pathology / Forensic Pathology
Gilbert Moeckel, MD, PhD	Associate Professor	Renal Pathology / EM
Jon S. Morrow, MD, PhD	Professor and Chair	Experimental Pathology, Autopsy
Antonio Galvao Neto, MD	Assistant Clinical Prof	General Pathology (VA)
Don Nguyen, PhD	Assistant Professor	Experimental Pathology
Vinita Parkash, MD	Associate Professor	GYN & GU Pathology (Bridgeport)
Marguerite M. Pinto, MD	Assistant Professor	General Pathology (Bridgeport)
Katerina Politi, PhD	Assistant Professor	Experimental Pathology
Manju Prasad, MD	Associate Professor	Endocrine/Head&Neck Pathology

David Rimm, MD, PhD	Professor	Experimental Pathology / Cytology
Michael Robek, PhD	Associate Professor	Experimental Pathology
Marie Robert, MD	Professor	GI Pathology
John K. Rose, PhD	Professor	Experimental Pathology
Nina Rose, PhD	Assoc Research Scientist	Experimental Pathology
Ozlen Saglam, MD	Assistant Professor	Gyn Pathology / Breast Pathology
Jennifer Schwartz, PhD	Assoc Research Scientist	Experimental Pathology
Gerald Shadel, PhD	Professor	Experimental Pathology
John Sinard, MD, PhD	Professor	Eye Path / Informatics / Autopsy
Jeffrey Sklar, MD, PhD	Professor	Molecular Pathology, Autopsy
Michael Stankewich, PhD	Assoc Research Scientist	Experimental Pathology
David Stern, PhD	Professor	Experimental Pathology
Fattaneh Tavassoli, MD	Professor	Gyn Pathology / Breast Pathology
Juilee Thakar, PhD	Assoc Research Scientist	Experimental Pathology
Constantine Theoharis, MD	Assistant Professor	Cytology
Alexander Vortmeyer, MD	Associate Professor	Neuropathology
Narendra Wajapeyee, PhD	Assistant Professor	Experimental Pathology
Zenta Walther, MD, PhD	Associate Professor	Molecular Pathology
Minghong Mimi Wan, MD,PhD	Assoc Research Scientist	Experimental Pathology
Brian West, MD	Professor and Vice Chair	GI Pathology, Surgical Pathology
Qin Yan, PhD	Assoc Research Scientist	Experimental Pathology
Raymond Yesner, MD	Professor Emeritus	Pulmonary Pathology
Luyang Yu, PhD	Assoc Research Scientist	Experimental Pathology
Haifeng Zhang, PhD	Assoc Research Scientist	Experimental Pathology
Mina Xu, MD	Assistant Professor	Hematopathology

Faculty, Department of Laboratory Medicine *(Updated 2011)*

Faculty	Rank	Specialty Interests
Sheldon Campbell, MD, PhD	Associate Professor	Medical Microbiology, POC
Sandy Chang, PhD, MD	Associate Professor	Molecular Diagnosis
Susan Cotmore, PhD	Senior Research Scientist	Virology
Lesley Devine, PhD	Assoc Research Scientist	Immune Monitoring Laboratory
Tore Eid, MD	Assistant Professor	Chemistry, Epilepsy, Metabolomics
Stephanie Eisenbarth, MD, PhD	Instructor	Immunology
Peili Gu, PhD	Assoc Research Scientist	Experimental Pathology
Ann M. Haberman, PhD	Assistant Professor	Immunology
Michael Hodsdon, MD, PhD	Associate Professor	Structural Biology, Toxicology
J. Gregory Howe, PhD	Associate Professor	Molecular Diagnostics
Peter Jatlow, MD	Professor Emeritus	Chemistry, Drugs of Abuse
Paula Kavathas, PhD	Professor	Immunology
Camille Keeler, PhD	Assoc Research Scientist	NMR, Protein Purification
Ashraf Khalil, DVM, MSc	Assoc Research Scientist	Experimental Pathology
Diane Krause, MD, PhD	Professor	Transfusion Medicine, Stem Cells
Marie Landry, MD	Professor and Vice Chair	Virology
Lei Li, PhD, MD	Assoc Research Scientist	Experimental Pathology
Herbert Malkus, PhD	Assistant Clin Professor	Clinical Chem, Lab Management
John McClaskey	Assistant Professor	Chemistry, Endocrinology
Ivailo Mihaylov, PhD	Assoc Research Scientist	Experimental Pathology

Thomas Murray, MD	Assistant Clin Professor	Microbiology
David Peaper, MD, PhD	Assoc Research Scientist	Virology
R. Rodion Rathbone, MD	Assistant Clin Professor	Computers, Informatics
Rekha Rai, PhD	Assoc Research Scientist	Experimental Pathology
Henry Rinder, MD	Professor	Hematopathology, Coagulation
Nelofar Shafi, MD	Assistant Clin Professor	Hematopathology
Mark Shlomchik, MD, PhD	Professor	Transfusion Medicine, Immunology
Brian Smith, MD	Professor and Chair	Hematopathology
Edward Snyder, MD	Professor	Transfusion Medicine
Gary Stack, MD, PhD	Associate Professor	VA, Blood Banking/Transfusion
Peter Tattersall, PhD	Professor	Virology
Christopher Tormey, MD	Assistant Professor	Transfusion Medicine, Hematology
Richard Torres, MD	Assistant Professor	Hematopathology, Bioengineering
Yang Wang, PhD	Assoc Research Scientist	Experimental Pathology
Yan Wu, MD, PhD	Associate Professor	Transfusion Medicine
Ping-Xia Zhang, MD	Assoc Research Scientist	Experimental Pathology

Faculty, Dermatopathology

Faculty	Rank	Specialty Interests
Marcus Bosenberg, MD, PhD	Associate Professor	Dermatopathology
Shawn Cowper, MD	Associate Professor	Dermatopathology
Anjela Galan, MD	Assistant Professor	Dermatopathology
Christine Ko, MD	Assistant Professor	Dermatopathology
Rossitza Lazova, MD	Associate Professor	Dermatopathology
Jennifer Madison McNiff, MD	Professor, Director	Dermatopathology
Antonio Subtil, MD	Assistant Professor	Dermatopathology

Resident Core Rotations

TRAINING LOCATIONS

The primary training in all tracks of the program is centered at the Yale-New Haven Medical Center. The Departments of Pathology and of Laboratory Medicine provide direct clinical service to all components of the Medical Center but are also responsible for service at the VA Connecticut Medical Center and Bridgeport Hospital, two of the other training locations. This institutional mix assures the residents will be exposed to a very broad range of clinical material, from the common everyday specimens to rare and unusual diseases and neoplasms.

Yale-New Haven Hospital *(Updated 2011)*

The majority of the resident rotations are at the Yale-New Haven Medical Center. Yale-New Haven Hospital (YNHH) is a nearly 1000 bed hospital, including the Smilow Cancer Center, which opened in late 2009. Pathology and Laboratory Medicine are separate departments at Yale, and as such each focuses on improving the quality of services and training in anatomic and clinical pathology, respectively. Pathology evaluates nearly 50,000 surgical specimens and over 90,000 cytology specimens each year, and performs approximately 220 autopsies. Laboratory Medicine performs over 5 million tests each year. Each department uses a specialty-based approach, in which clinical services are provided by attendings who have specialized in particular areas of interest and expertise. Resident rotations are similarly divided along specialty lines. This affords the residents an in-depth exposure and emersion in focused areas of study, emphasizing the subtle nuances of various disease processes.

The Department of Pathology has clinical space in the East Pavilion of YNHH, where the surgical pathology and inpatient cytopathology services are located. The autopsy service, administrative offices, and research space are located in the Brady and Lauder buildings of the Medical Center. These areas are connected by intervening buildings, so travel from one to the other does not require going outside. Outreach cytology is in a separate building, but plans are underway to move into the main complex. The clinical space in the East Pavilion is recently renovated (May 2008). With the opening of the Smilow Cancer Center in 2009, Pathology moved it's frozen section operation to be adjacent to the new operating rooms. This space is a short walk from the main signout area.

The Department of Laboratory Medicine recently moved its clinical laboratories and administrative offices to the brand new state-of-the-art Park Street Building, immediately adjacent to the Smilow Cancer Center in the Medical Center complex. Research space remains clustered on four floors of the Clinic Building of the Medical Center.

Veterans Administration Connecticut Healthcare System

The Pathology department at the West Haven campus of the Veterans Administration Connecticut Healthcare System (located just 10 minutes away from YNHH by shuttle) is staffed, in part, by members of Yale's Departments of Pathology and Laboratory Medicine. It provides both anatomic and clinical pathology services, and therefore offers unique opportunities for instruction in the integrated approach to laboratory diagnosis. The hospital has 200 beds and performs over 2.3 million

laboratory tests each year. The anatomic pathology service handles virtually all aspects of diagnostic anatomic pathology including surgical pathology, cytology, and autopsy pathology. The laboratory medicine service provides clinical testing for patients at that facility and also serves as a reference laboratory for other VA hospitals across the country in the areas of molecular diagnostics, pharmacogenetics, mycobacteria, and virology.

The VA-CT West Haven campus is also the home of the Pathology Assistant program, and PA students are used extensively at the VA to assist in many technical aspects of the laboratory including the gross room. The residents are, however, still responsible for understanding the gross analysis of all complex specimens.

Bridgeport Hospital *(Updated 2011)*

The Pathology department at Bridgeport Hospital is staffed by the Department of Pathology at the Yale School of Medicine. Bridgeport Hospital is a 425-bed community hospital located about twenty miles west of New Haven. Although the Pathology department provides both anatomic and clinical pathology services at Bridgeport Hospital, the residents currently rotate only through the anatomic pathology services. This includes over 13,000 surgical specimens and 4,000 cytology specimens.

This community hospital setting broadens the exposure of residents in training beyond the academic medical center practice model by providing them with an opportunity to integrate into the workflow of a larger community hospital pathology department. The case mix complements that seen at Yale. Residents benefit from direct exposure to a setting more akin to a private practice model and can use this experience to help formulate their long term career plans. Resident travel expenses to Bridgeport Hospital are reimbursed by the Program.

NYC Medical Examiner Office - Bronx

Connecticut has a centralized medical examiner system, and by State statute all autopsies performed by authorization of the State are performed at the Office of the Chief Medical Examiner (OCME) in Farmington, CT. Therefore, residents do not get exposed to forensic autopsies during their rotation at YNHH. To allow the residents to participate in forensic autopsies, each resident does a two week rotation at the New York City Medical Examiner's Bronx Office. Dr. James Gill, a former Yale Pathology Resident and now a Deputy Chief Medical Examiner for NYC coordinates the experience of the residents while on this rotation. The rotation requires travel to New York on a daily basis. This can be done by car or by train. Resident travel expenses are reimbursed by the Program.

RESIDENT RESPONSIBILITIES AND COMPETENCIES

General Resident Responsibilities

Pathology residents at Yale must demonstrate a commitment to professional responsibilities and adhere to strict ethical principles throughout their training. Although individual patient contact is less common in pathology than other medical disciplines, residents must be prepared to communicate in a

sensitive manner to a diverse patient population. Additionally, residents must be able to communicate and work effectively with team members and other professional associates. Residents are expected to demonstrate respect, integrity, and collegiality when dealing with surgeons, referring physicians, faculty and ancillary healthcare professionals. Patient confidentiality is of the utmost importance, and residents must ensure that they do not leave confidential material (slides, reports, etc.) in public areas, such as conference rooms. Commitment to on-going professional development is stressed at every level of the program, and residents are encouraged to explore and expand their individual goals without sacrificing excellent patient care.

All Residents *(Updated 2011)*

Each of the individual rotations carries with it specific responsibilities and expectations. However, there are a number of general and administrative responsibilities which apply across ALL of the rotations, and to which residents are expected to adhere throughout their training. These include:

- Show up for work no later than 8AM each morning, and stay until all of your duties have been discharged, but generally until at least 5PM. If you finish before 5PM, use this time for independent study or other investigative projects that advance your training and/or the field of pathology
- Attend resident conferences. This is an important forum for building a foundation of knowledge that will be advanced during your individual rotations.
- Be available by beeper from 8AM until 5PM each weekday, plus whenever you are on call
- Learn how to present cases at a conference, with text, clinical data, and, when appropriate, gross, and microscopic slides
- Learn to collaborate with managerial and clerical/technical staff
- Assume responsibility for your own education
- Teach rotating medical students, pathology assistants, and fellow residents. Acting as an educator for others in the medical profession is an important role for pathologists.
- Complete all evaluations in a timely fashion
- Document all of your duty hours, as well as vacations, sick days, and any other time away from training

AP-1 Rotations *(Updated 2011)*

Acquisition of technical skills and knowledge are primary focuses of the first year of anatomic pathology training. Responsibilities and goals include:

- Complete multiple autopsies (evisceration and dissection), PAD and final reports for adult, pediatric, and perinatal cases:
  - perform a neck, brain, and spinal cord removal
- Know how to efficiently handle all types of surgical specimens including:
  - accurate and appropriate dictations
  - proper selection of sections
  - asking questions when unsure and follow directions
  - accessioning a case
  - grossing in biopsies from the different subspecialties
  - freezing tissue for special studies
  - document appropriate supervision as you learn to dissect new types of specimens
- Perform efficient signout of cases including:

- pulling pertinent old cases
- tracking pending cases
- organizing multipart cases
- effectively managing your caseload
- verbally describing a gross and microscopic section and formulating a differential diagnosis
- appropriate assignment of fee codes

• Attain competency in gross and microscopic photography
• Knowledge of CoPath system:
- ability to order special stains
- ability to edit a provisional anatomic diagnosis
- spell check reports
- perform electronic searches of the medical literature

AP-2 Rotations

Residents in their second year of anatomic pathology training are expected to show greater diagnostic proficiency and a broader fund of knowledge than the AP-1 residents. In addition, they should be more adept technically, and at managing their time. Responsibilities include all those for the AP-1 rotations, plus the following:

• Supervise, advise, and educate AP-1 residents in the grossing of specimens
• Perform touch-preps and frozen sections
• Assist frozen section resident with frozen sections
• Provide efficient and confident diagnostic interpretations in the different specialty and general services
• Demonstrate a thorough understanding of the special procedures available to provide decisive tissue analysis for diagnosis and prognosis
• Interact with clinicians regarding specific details of a case
• Present cases at interdepartmental conferences
• Attend interdepartmental conferences, such as Chest Conference, Breast Conference, Heme Staging Conference, Bone Marrow Aspiration Conference, GYN Tumor Board, Pediatric Surgery Conference, Pediatric Tumor Board, Neurosurgery Conference and Neuropath Conference
• AP-2 residents should participate in a research project under the supervision of an attending.

AP-3 Rotations

Senior residents in anatomic pathology have an implicit responsibility for the supervision, assistance, and training of the junior residents. This is not only an important part of your educational experience, but also builds camaraderie within the program. Junior residents will be asked to evaluate how successfully the senior residents fulfill this responsibility.

Senior residents should also voluntarily “step-to-the-plate” to address issues that may arise in the daily clinical care of patients, independent of which service they are on. Inquiries by clinicians from other departments should be addressed, investigated, and if necessary referred to the appropriate attending staff. Senior residents are expected to be able to represent the department and its policies to individuals in other departments.

CP-1 Rotations

First year residents in clinical pathology focus on learning the details of laboratory diagnostics, including the capabilities and limitations of each laboratory test. Learning appropriate interpretation and utilization of the tests is accomplished through direct clinical consultation. Responsibilities and goals include:

- Acquire critical skills in Clinical Pathology and understanding of laboratory principles
- Assist the medical staff with the interpretation of laboratory results
- Participate in decision-making for optimal strategies for the use of the laboratory in patient management

CP-2 Rotations

In their second year of clinical pathology training, residents take on greater supervisory and decision making responsibilities in each of the laboratories. Responsibilities include all those for CP-1 rotations, plus:

- Supervising the performance of apheresis procedures
- Supervising collection of peripheral blood stem cells
- Oversight for point-of-care testing
- Assisting in beta site instrument testing
- Consultations on clinical enzymology and pharmacokinetics cases
- Integrated case-oriented diagnostics combining flow cytometry, hematopathology morphology, cytogenetic, and molecular diagnostics
- Interpret direct immunofluorescent staining
- Acquire skills in mycobacteriology, mycology, and parasitology interpretations
- Interpret HIV western blots and HCV genotyping by line probe assay
- Conduct CAP mock inspections
- Oversee and signout of proficiency testing
- Oversight of validation studies

Chief Residents

In addition to their other duties and responsibilities as appropriate for their level of training, individuals selected to serve as the Chief Resident(s) in Anatomic or Clinical Pathology have additional duties.

- Work with the Program Director and Associate Program Directors to address the administrative needs of the program
- Establish resident rotation schedules
- Address emergency scheduling needs due to illness or unexpected absences
- Schedule morning educational conferences
- Assure that attendance sheets are completed for all formal conferences and that these are turned in to the Program Coordinator
- Set an example of proper conduct and professionalism for the other residents
- Resolve conflicts or disputes that may arise among/between residents. Conflicts that cannot be resolved should be brought to the attention of the Program Director.

- To the extent possible, remain reachable by phone or pager, even off-hours and when not on call, to help address questions of resident staff who are on call
- Identify aspects of the program needing improvement and propose solutions to the Program Director
- Represent ALL resident issues to faculty and staff
- Uphold ALL departmental and Program policies amongst the residents

Resident Competencies *(Updated 2011)*

The Accreditation Council for Graduate Medical Education has defined six areas of competency in which all residents are to be trained and evaluated, and this competency model has been adopted at all levels of medical education, from undergraduate through licensing and credentialing. In brief, these areas are:

Patient Care: how you apply your medical knowledge in caring for patients
Medical Knowledge: what you know
Practice-based Learning and Improvement: how you continually work to improve your ability to provide patient care
Interpersonal and Communication Skills: how you interact with others
Professionalism: how you present yourself
Systems-based Practice: how you work within the healthcare system

The goals and objectives for each of the resident rotations are based on these competency areas. While each rotation has some specific goals and objectives, there are a large number of competencies that are COMMON TO ALL rotations. These are listed below. **Additional** goals and objectives specific to particular rotations are listed with those rotation descriptions.

Patient Care: Residents must demonstrate a satisfactory level of diagnostic competence and the ability to provide appropriate and effective consultation in the context of pathology services. This includes:

All AP Rotations:

- becoming proficient in the standard techniques for the gross evaluation, dictation, and dissection of specimens, paying particular attention to issue of diagnostic and prognostic significance
- understanding when it is appropriate and preferable to deviate from standard dissection techniques to better demonstrate the pathology in a particular case
- becoming proficient in specimen photography, including knowing how to best prepare the specimen for photography and use of the photographic apparatus
- looking up, prior to signout, any clinical terms or abbreviations used on the requisition form
- generating appropriate differential diagnoses based upon gross examination of the specimen and the clinical questions in the case, and triage the specimen appropriately for optimal diagnostic evaluation
- promoting expedient signout of cases: preview slides, correct gross descriptions, and bring cases to signout in a timely fashion
- identifying when it is appropriate to track down prior material from the patient of relevance to the current evaluation and obtain that material prior to signout
- reliably order special stains and ancillary studies as directed by the attending
- integrate frozen section diagnoses into the final report

Additional Competencies for AP-2 residents:

- refining and perfecting gross room skills, including proactive tissue storage for ancillary studies
- being able to search the literature, as needed, in the workup of cases, and bring that information to signout
- analyze frozen sections for possible discrepancies
- understand the workings of the histology and immunohistochemistry labs

All CP Rotations:

- becoming proficient in the use and interpretation of diagnostic assays relevant to each laboratory
- promoting laboratory medicine consultation as a means of efficiently providing optimal care

Medical Knowledge: Residents must demonstrate knowledge about established and evolving biomedical, clinical and cognate sciences and application of this knowledge to pathology. This includes:

All AP and CP Rotations:

- know and apply basic and clinically supportive sciences to problems in diagnostic medicine

All AP Rotations:

- demonstrating an ability to glean from the specimen requisition form, procedure performed, and electronically available medical information, the pertinent clinical questions to be addressed during the specimen examination
- formulating appropriate microscopic differential diagnoses for the case
- understanding what, if any, special procedures can be performed to resolve the differential diagnosis
- understanding the clinical significance of the diagnoses being made, including implications for the subsequent treatment and prognosis of the patient
- understanding the data elements which need to be included in the pathology report to provide the treating clinicians with the information they need for the subsequent care of the patient

All CP Rotations:

- acquire critical skills in clinical pathology and understanding of laboratory principles
- appropriately increase their knowledge base with literature searches, reading texts, accessing journals on current cases
- learn the principles of laboratory automation
- become familiar with the strengths and limitations of current and emerging laboratory technologies
- perform appropriately on the end of rotation quizzes

Practice-based Learning and Improvement: Residents must be able to demonstrate the ability to investigate and evaluate their diagnostic and consultative practices, appraise and assimilate scientific evidence and improve their patient care practices. This includes:

All AP and CP Rotations:

- actively seeking additional clinical information by consulting patient information systems within the hospital and/or calling residents/fellows on the clinical teams
- using on-line literature searching resources to identify recent advances in our understanding of the disease processes manifested in the cases
- learning to critically evaluate clinical and scientific studies, using knowledge of study designs and statistical methods

- accepting and learning from constructive feedback and guidance from those in a position to provide such input, including attending physicians, laboratory supervisors and housestaff colleagues
- use the daily case material to systematically assess his/her current level of skills, and with attending advice, develop a plan to remediate deficiencies and enhance areas of strengths
- promoting self-evaluation to develop life-long learning skills

All AP Rotations:

- monitoring their active case lists, and organizing their cases and time in such a way as to provide as timely as possible final reports without compromising the care of the patients

All CP Rotations:

- becoming proficient at QA design and implementation
- expertly evaluating tests and procedures for clinical utility

Interpersonal and Communication Skills: Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with other health care providers, patient, and patient's families. This includes:

All AP and CP Rotations:

- effectively conversing about general pathology with clinicians, housestaff, and medical students
- attending conferences and be able to discuss the key features of their cases
- when indicated, contacting the members of the clinical team and eliciting appropriate key information about the patient's medical history and specific questions to be addressed during evaluation of the specimen
- contacting members of the clinical team in cases where the diagnosis is unexpected and has significant clinical implications for the patient
- demonstrating an ability to prepare and present cases at intra- and interdepartmental conferences
- effective teaching of fellow residents, pathology assistant students, technicians, and medical students

All AP Rotations:

- dictating a well organized, understandable, grammatically correct clinical history and gross description

All CP Rotations:

- proficiently handling and documenting all consultations

Professionalism: Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. This includes:

All AP and CP Rotations:

- demonstrating unconditional respect for patients, clinical colleagues, and the medical profession
- showing up on time for scheduled activities (signout, rounds, conferences, etc.)
- responding promptly when on service and/or on call to a service need and promoting the efficient, thorough, and expeditious processing of that specimen so as not to compromise subsequent patient care
- demonstrating an understanding of the importance of preserving patient privacy and confidentiality in the performance of their duties
- understanding medical error and its causes, and responding appropriately when errors occur
- interacting with fellow residents, assisting as needed to promote efficient running of the service

- interacting with clinical colleagues in a non-confrontational and professional manner

Systems-based Practice: Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to call on system resources to provide pathology services that are of optimal value. Pathologists occupy a unique position within health care delivery. Free from the day-to-day details of direct patient care delivery, pathologists have the opportunity and obligation to analyze and explore human disease. Residents must acquire the ability to assume this role by learning to:

All AP and CP Rotations:

- collaborate with other members of the health care team to improve patient care
- promote the practice of evidence based health care delivery, drawing upon literature and other investigative work
- educate our clinical colleagues in diagnostic criteria and the anatomic and laboratory manifestations of human disease
- use special procedures and additional testing judiciously to assure accurate diagnoses without wasting or misusing health care resources
- effectively use ancillary clinical information systems to improve patient care delivery
- participate actively in programs assuring the quality of health care, including presentation of cases at case conferences and at morbidity and mortality conference
- understand the difference between part A and part B pathology services in a hospital setting
- demonstrate an awareness of regulations such as CLIA (Clinical Laboratories Improvement Act) and HIPAA (Health Insurance Portability and Accountability Act) Privacy and Security rules, and assure compliance with these rules to improve the health care delivery system
- understand the roles of accurate CPT (Clinical Procedural Terminology) and ICD (International Classification of Disease) coding in assuring appropriate reimbursement for health care delivery
- promote and participate in obtaining tissue and other human material for research which will advance our understanding of human disease, without compromising patient care or patient rights
- demonstrate an appreciation of the importance of accurate data entry into the department's Clinical Information System which will allow appropriate retrieval of cases for approved research or educational purposes
- appreciate the impact of our diagnoses on the lifestyles, insurability, subsequent management, and long term care of patients
- demonstrate an understanding of the role of pathology in the medical care system through participation in multi-disciplinary patient care conferences (e.g. tumor boards), appropriate coding of cases, and participation in the quality assurance activities

ANATOMIC PATHOLOGY ROTATIONS

Rotations in Anatomic Pathology are based on three major services within the Department of Pathology at Yale-New Haven Hospital (Autopsy, Cytology, Surgical Pathology), supplemented by exposure to anatomic pathology practice in two different settings (Bridgeport Hospital and the Veterans Administration Medical Center).

Introduction to Histology/Immunohistochemistry (AP-1) *(New 2011)*

Cindy DeRiso and Staff

One central process fundamental to the practice of anatomic pathology is the preparation of histologic slides. Residents will spend a significant portion of their training dissecting tissue and selecting areas to be made into slides. A lot happens to the tissue between the time the resident closes the tissue cassette and when the slide leaves the histology lab. Understanding of the processes involved is important for the resident to appreciate the strengths and limitations of these processes, as well as potential artifacts that can arise.

To expose and educate residents in this process, all AP-1 residents will be scheduled to observe and participate in the operation of the histology and immunohistochemistry labs. This activity will occur from 7-8AM when they are on their first autopsy rotation. In addition, each AP-1 resident will be expected to prepare the slides from their first autopsy case, including embedding and microtomy.

Additional Resident Duties and Responsibilities

- As scheduled, report to the histology lab by 7AM and observe/participate in lab activities until the morning conference at 8AM.
- Coordinate with histology staff and arrange time during your first rotation on autopsy to work with the histotechnologists to embed and cut the tissue blocks from one of your own autopsy cases

Additional Goals and Objectives for the Histology Experience

Medical Knowledge:
- become familiar with the processes involved in converting selected tissue sections into histology slide

Practice-based Learning and Improvement:
- understand the potential sources of artifacts in the preparation of histology slides which could affect the accurate interpretation of those slides

Interpersonal and Communication Skills:
- work with members of the histology lab collaboratively as issues arise with respect to quality of histology sections

Professionalism:
- appreciate the work environment of the histology lab and the technical skill of the histotechnologists

Autopsy Service

Dr. John Sinard, Director
Arthur Belanger, Manager

The Autopsy Section investigates disease by postmortem study of tissues and the clinical record. It is essential to the closing of a patient's record. It provides verification of diagnosis and therapy, as well as important epidemiological information, and is an important source of teaching material for pre- and post-graduate training. Hospital policy requires that an autopsy be requested on all hospital deaths. Results from autopsy investigation of deaths are directly incorporated into quality assurance programs in the hospital. The case mix reflects the combined general medical and surgical hospital plus tertiary care center that characterizes the Yale New Haven Medical Center. In addition, the residents on the service cover autopsies at Bridgeport Hospital (patients are transported to Yale),

adding the case mix of a large community hospital to the experience, and cover the VA Connecticut Healthcare System autopsies (autopsies are performed at the VA), providing yet another unique patient population.

Autopsies are performed seven days a week, 365 days a year. A dedicated technical and clerical staff ensures the smooth running of autopsy services. A highly efficient laboratory staff assists residents in the timely evaluation of cases. Tissue sections are returned to house officers within 48 hours and turnaround time for special stains is the same as for surgical specimens.

Autopsies are performed primarily by AP-1 residents. For each patient autopsied, an attending pathologist assumes the responsibility for the diagnostic evaluation and clinical-pathological correlation. Provisional Anatomical Diagnoses are reported within 24 hours of the autopsy. The resident is encouraged to prepare cases for the Final Anatomic Diagnosis as soon as possible so that appropriate information can be given to clinical attendings and the family of the deceased.

Clinical teaching through the autopsy is encouraged. Peer teaching and medical student teaching are opportunities for the pathologist in training to learn teaching skills. House officers are expected to present autopsy findings at interdepartmental conferences. Pathology Assistants in training learn autopsy technique and gross pathology through interaction with the resident staff and technical staff. Appropriate specimens are triaged into the teaching collection.

An important function of an academic autopsy service is to procure tissues for research purposes. This activity is coordinated by the Tissue Procurement Module of Yale Pathology Tissue Services. The autopsy service provides tissues to investigators following the approval of the research protocol by the Human Investigations Committee. Not infrequently in a tertiary care center such as Yale-New Haven Hospital, diagnostic evaluation and clinical research are synchronous and complementary.

A detailed manual describing the operation of the autopsy service, including the autopsy process, technical procedures, and the autopsy report, is provided separately to the house staff.

Autopsy Pathology Rotation (AP-1) *(Updated 2011)*

Dr. John Sinard and Faculty

Yale New Haven Hospital, as a tertiary care center, Bridgeport Hospital, representing a large community hospital, and the VA afford the opportunity to perform a diverse array of autopsies. This includes a number of perinatal/pediatric autopsies in addition to the adult autopsies. These cases are supplemented by a small number of consult cases from outside the hospital. Historically, this service represents a cornerstone in the Department and intense teaching and numerous conferences revolve around this service. Both junior and senior level residents are integral to the function of this service, beginning with review of the chart and discussions with the clinical team, through the performance of the autopsy, to presentation of the findings and generation of the final anatomic diagnosis.

Each case is presented in conference format to the autopsy attending, residents and students assigned to the service. Clinical staff are encouraged to attend. The initial emphasis is correlation of anatomic diagnoses with clinical diagnoses, problems, and management strategies. Microscopic evaluation and further correlation follow. Three weeks is the expected time for autopsies to be completed. In addition, the autopsy service is an important focus for teaching residents pathology. Autopsy case review conferences (gross), case microscopic reviews, construction of the clinical-pathological summary, resident conferences based on challenging cases, and related reading are the educational

components of the autopsy. Intradepartmental consultation is encouraged. Case reporting and clinical investigation are academic exercises available to residents through autopsy services.

Typically, two AP-1 residents and one AP-2 or AP-3 resident staff the autopsy service. These residents cover all autopsies performed on patients from YNHH, Bridgeport Hospital, and the VA (West Haven campus). Patients from Bridgeport Hospital who are to be autopsied are transported to the Yale Autopsy facility for autopsy. VA autopsies are performed at the VA. Each weekend, two AP-1 residents are assigned to cover the service for weekend autopsies. They cover autopsies from all three facilities.

The goal of this rotation is to initially train the AP-1 resident in the techniques of performing an autopsy with evolution to becoming an adroit prosector with synthesis of all clinical and pathological data. The autopsy should be treated as a medical consult. The resident's goal is to perform a thorough examination and then interpret the findings in light of the clinical setting, drawing upon their professional knowledge and experience. The resident is always supervised by a faculty member throughout the course of an autopsy to its completion and this individual continuously evaluates the resident's progress. Direct supervision by a faculty member, PA, or senior resident is required for the first three autopsies of each type that the resident performs. Each resident is provided with a detailed manual describing the specifics of the service policies and procedures.

Residents on the autopsy service are encouraged to select two of their cases for advanced diagnostic workups. The purpose of this activity is to provide residents a practical exposure to the growing breath of alternate diagnostic modalities such as molecular testing. Details of this are available in the Autopsy Service Manual.

Additional Resident Duties and Responsibilities

- Check in with the autopsy service immediately after conference and just after 9AM on weekends when assigned to cover the service
- Verify that the autopsy permit is valid before starting the autopsy
- Discuss the case with at least one member of the clinical team prior to performing the autopsy
- Be sure the technician has entered into the computer the names of all of the clinical team members so that they all receive copies of the report.
- Discuss the case with the autopsy senior resident and then the pathology attending prior to performing the autopsy. If the brain is to be removed, discuss the case with the neuropathology attending as well.
- Assure that accurate photographic documentation of the case is completed.
- Document supervision of your first three autopsies of each type on the Resident Supervision Documentation form
- Enter the PAD into the computer following (or ideally, prior to) presentation of the case to the attending.
- Routinely select up to five cassettes for "rush processing" to allow incorporation of these findings into the PAD. If necessary, a limited number of special stains can also be requested rush.
- Contact the members of the clinical team (especially anyone with whom you discussed the case prior to performing it and also the individual who secured the autopsy permission) as soon as possible after the case to provide them with verbal feedback of your findings.
- Expect to be involved in any presentation of your cases at conferences within and/or outside of the department.
- With faculty assistance, identify at least two autopsy cases where an advanced diagnostic workup would be appropriate for the case, and perform that workup

- Do not forget about your autopsy cases or simply "let them sit" until the next time you are on a light rotation. The College of American Pathologists requires that final autopsy reports be mailed within 30 days of the autopsy.
- Although most cases which arrive for autopsy after 3PM are held over until the following day, there are rare occasions when you may be required to perform an autopsy after that point, even perhaps in the middle of the night. Therefore, when you are on the autopsy rotation, you should consider yourself "on-call" 24 hours a day, and be reachable by beeper at all times.
- If you are the one of the residents covering the service over a weekend or holiday, be sure to check with the rest of the on-call team, including the attending, before the weekend begins. Make sure you are available by beeper or by phone at all times. If you think you may be out of range, call in every hour or so to make sure there is nothing requiring your attention.

Additional Goals and Objectives for the AP-1 Autopsy Rotation

Patient Care:

- determining that an autopsy permit is valid, that permission has been given by an appropriate individual, and noting any restrictions
- recognizing when a particular case falls under the jurisdiction of the medical examiners office
- adhering to and applying universal precautions in the day-to-day activities in the autopsy room
- becoming proficient in the standard techniques for the evisceration and dissection of adults, children, and fetuses, preserving anatomic relationships and connections as appropriate, and understanding when it is appropriate and preferable to deviate from standard technique to better demonstrate the pathology in a particular case (first two months)
- becoming proficient in specialized dissection techniques, performing them without prompting when the details of the case call for a specialized approach (second two months). These would include removal of the brain and spinal cord as a connected unit, preservation of the inferior vena cava and portal vascular systems, removal of the eyes, dissection of the mesenteric vessels, etc.
- ability to generate appropriate differential diagnoses based upon gross examination of organs and tissues, and perform the appropriate histologic and special studies needed to resolve those differentials
- recognizing patterns of anatomic changes across organ systems as being related to a single underlying disease process
- completing autopsy provisional and final reports in a timely fashion
- in a graduated fashion over the four months of the rotation, acquiring the ability to perform a complete autopsy examination independently

Medical Knowledge:

- demonstrating an ability to glean from the medical record the pertinent clinical questions to be addressed during the autopsy examination
- demonstrating an understanding of the clinical correlates and manifestations of pathology identified at autopsy
- learning to photographically document an autopsy case, including all abnormal and pertinent normal findings
- writing a well-organized, thorough, and educational summary which addresses the clinical questions and draws upon recent advances in our understanding of the particular disease processes manifested in the case

Practice-based Learning and Improvement:

- actively seeking out additional clinical information by consulting patient information systems within the department and hospital

- using on-line literature searching resources to identify recent advances in our understanding of the disease processes manifested in the autopsy cases
- monitoring their own case distribution (adults vs fetal) to assure a broad-based exposure to the variations in technical and diagnostic skills based on patient age
- obtain practical exposure to advanced diagnostic techniques

Interpersonal and Communication Skills:

- contacting members of the clinical team and/or private primary care providers for the patients prior to beginning the autopsy and eliciting appropriate key information about the patient's medical history and specific questions to be addressed during the autopsy
- learning to present a concise, organized clinical summary of the patient to the attending pathologist prior to the autopsy and organ review, including pertinent negative information
- re-contacting members of the clinical team upon completion of the autopsy to discuss findings and, as needed, obtain additional clinical correlation for pathology identified at autopsy
- learning to draw upon the assistance of technicians, students, and fellow residents during the performance of the case without losing control of the case and with the understanding that the responsibility for all aspects of the case remains with the primary resident
- writing a well organized, understandable, grammatically correct report which reports findings and educates without being overly critical or inflammatory
- demonstrating an ability to prepare and present cases at interdepartmental conferences, appropriately summarizing the clinical history and selecting appropriate gross and microscopic photographs for presentation
- effective teaching of fellow residents (second month on service), pathology assistant students, and medical students in various aspects of autopsy practice and the pathologic evaluation of organs and tissues

Professionalism:

- responding promptly when on service and/or on call to a case and promoting the efficient, thorough, and expeditious performance of that case so as not to compromise family funeral arrangements
- interacting with fellow residents, assisting as needed to promote efficient running of the autopsy service
- demonstrating an ability to view the clinical case from the point of view of the clinicians with the information available to them at the time, and not simply with the full knowledge of the autopsy findings
- interacting with clinical colleagues in a non-confrontational and professional manner when issues of appropriateness of clinical care are discussed
- demonstrating an ability to speak to family members about the autopsy in general and about the findings from an autopsy the resident has performed. This includes assisting in obtaining informed consent from family members for performance of an autopsy

Systems-based Practice:

- accurately and appropriately identify and enter "Clarifications/Discrepancies" from each autopsy case into the clinical information system to allow inclusion in institutional quality assurance programs

Autopsy Senior Resident Rotation (AP-2 and AP-3)

Dr. John Sinard and Faculty

Senior residents rotating on the autopsy service manage the day-to-day medical issues of the service, and should think of the autopsy service as "their" service. Proper handling of autopsy cases, training

of residents, and coordinating the dissemination of autopsy findings through communication with clinical teams and presentation of cases at conferences is the responsibility of the senior resident on the service. This is not to say that this resident should actually present each and every case himself or herself. Learning how to properly train and delegate these responsibilities to the junior residents while at the same time assuring the quality and completeness of those tasks is an important part of the senior resident's training while on the service. Issues that the senior resident does not feel qualified to address directly should be referred to the attending pathologist (if it is a case related issue) or to the director of the autopsy service.

Additional Resident Duties and Responsibilities

- This service MUST be covered by a senior resident at all times.
- Keep your beeper on at all times so that you can be contacted. Be available and prepared to address any and all medical issues that arise while assigned to the service. Matters for which you do not have the proper experience should be referred to the attending on the case (for case specific concerns) or the director of the autopsy service
- Contact autopsy technical staff each morning (usually just after morning conference at 9:00 am) to check on status of cases; keep informed throughout the day of any changes, pending cases, etc.
- Monitor the junior residents to be sure they are progressing at an appropriate pace and fulfilling their responsibilities.
- Assign cases to the residents on the service in an equitable manner.
- Assist junior residents in interpreting clinical record, seeking additional information (e.g. lab, radiology) and contacting clinicians involved. On the basis of information obtained, determine the best approach to each particular autopsy. Pay particular attention to clinical questions to be answered, viral and bacterial cultures to be obtained, and any other special tissue requirements (e.g. fresh tissue for EM, tumor or genetic studies, liver for Carnoy's, lymph nodes for B5).
- Make sure that the attending for the case is appropriately notified (attendings vary in the degree to which they wish to be involved in the autopsy, and this may change on the weekend). It is advisable to discuss this with each attending at the beginning of their rotations on service. Most attendings would like to be called after the clinical information has been gathered but before the autopsy starts. (NB: The attending for weekend autopsies is the attending on service the following Monday.)
- When necessary due to case load or junior resident staffing, the chief resident should assume primary responsibility for cases, including completing all of the paperwork/reports for such cases. Usually, after each junior resident assigned to and present on the service has received two cases on any given day, and there is still another case to do, the chief resident should take a case.
- Supervise any post-sophomore fellows on the service. In some instances, the post-sophomore fellow may be allowed to assume primary responsibility for a case, but the chief resident must supervise the post-sophomore fellow during every aspect of the case.
- Be available to discuss the case with the resident prior to performing the autopsy. Provide advice as to technique and special procedures.
- Make sure the technicians have contacted a member of the Yale Pathology Tissue Procurement team prior to the beginning of the case. This is particularly important in cases in which neoplasms are suspected. You should be familiar enough with the case to be able to give an initial assessment as to which tissues are likely to be available from the case for research purposes.
- Be available to assist the junior resident(s) during the autopsy, train them in appropriate autopsy techniques, and encourage the use of special procedures such as frozen section and specimen x-ray where indicated.
- Gradually transfer increasing responsibility for the case to the AP-1 resident

- Act as diagnostic consultant for the junior residents, discussing differential diagnoses for any lesions encountered.
- Make a special effort to teach any medical students or other visitors who may be present in the room during the autopsy.
- Be sure tissue is frozen, where appropriate, for diagnostic and research purposes. This includes all tumors. Tissue should be frozen either by a Yale Pathology Tissue Services representative or by yourself. These tissues must be transported to the -80°C freezer the day of the autopsy or left in the cryobath since the cryostat goes through a thaw-refreeze cycle every evening.
- Review the case with the junior resident after he or she has laid out the organs but before the attending arrives to review the case. Be sure everything has been dissected properly and completely, and that the room is in a presentable state for review of the case.
- Assist in the preparation of the PAD. Be sure it is accurate, complete, and in the proper format. Be sure to discuss with the attending what your role in the signout of the PAD will be.
- Be available to review the slides for the case with the junior resident and to assist them in preparing any conference presentations of the case within or outside of the department.
- Review the final report with the resident before it goes to the attending for review. Assure that the report is complete, accurate, and in the proper format. Remember, your name is on this report as well.
- "Encourage" the junior resident, as needed, to have the final autopsy report completed and ready for the attending within 3 weeks of the autopsy.
- If at all possible, the weekend chief-on-call should be present for the Monday morning review of the case with the attending and follow through with assisting the junior resident in preparing the PAD. When responsibilities of another service make this impossible, be sure to "sign-off" on the case with the autopsy chief resident so that they can perform these tasks.
- Coordinate interdepartmental morbidity and mortality conferences as necessary
- Coordinate the weekly gross conference, including case selection. The Conference may be conducted on autopsy or surgical material on an alternative basis, depending on the availability of cases.
- Be responsible for coordinating Wednesday brain cutting
- Bring up any issues regarding technical support and facilities with the Manager of the Autopsy Service and/or the Director
- Assist with regular extradepartmental conferences as needed; slides and reports will be pulled for you and in your box sometime in the morning. If you have any questions about the arrangements for this conference, see the Report Generation Supervisor.

Additional Goals and Objectives for the Autopsy Senior Rotation

Patient Care:
- training junior residents in the techniques of autopsy evisceration and dissection
- obtaining experience running a medical service
- mediating as needed between the attending pathologist and junior residents on the service
- being fully aware of the details of on-going and pending cases
- understanding what constitutes a medical examiner reportable case and appropriately bringing such cases to the attention of morgue staff
- proofreading junior resident write-ups in a timely fashion, providing direction, constructive criticism, and assistance
- as needed due to case load or junior resident staffing, taking primary responsibility for cases, including writing the report for such cases

Practice-Based Learning and Improvement:
- intervening in complicated cases to assist the coordination of obtaining history and special studies
- selecting and preparing material for the weekly gross conference

Interpersonal and Communication Skills:
- coordinating communication with members of the clinical team and/or private primary care providers to provide feedback as to autopsy findings
- learning to delegate responsibility to junior residents and technical staff without compromising patient care
- effective teaching of junior residents, pathology assistant students, and medical students in various aspects of autopsy practice and the pathologic evaluation of organs and tissues

Forensic Pathology Rotation (AP-1)

Dr. Jim Gill and Faculty

The educational objectives of this rotation are met by a series of comprehensive lectures designed by the Medical Examiner's Office of the City of New York as a didactic element of training. These mandatory lectures are given approximately monthly in the early evening. The lectures are supplemented by a two-week forensic rotation with the New York City Medical Examiner's Office during the anatomic pathology portion of the program, usually in combination with an autopsy rotation. On this rotation, the resident has the opportunity to observe/perform several autopsies daily.

Additional Resident Duties and Responsibilities

- During the rotation, the resident has the opportunity to attend court (to see a medical examiner testify) and to go to death scenes with the medicolegal investigators to see how the medical examiner's office interacts with the police, crime scene unit, and next of kin.

Additional Goals and Objectives for the Forensic Pathology Rotation

Patient Care:
- becoming proficient in the standard techniques for the forensic autopsy, paying particular attention to issues of diagnostic and medicolegal significance
- generating appropriate differential diagnoses based upon gross examination of the specimen and the clinical and medicolegal questions in the case
- understanding what ancillary studies are needed in particular cases (pediatric deaths, homicides), such as cultures, metabolic screens, radiographs, DNA testing, toxicology.
- demonstrating the ability to suggest appropriate testing (e.g., SIDS work-up) and interpretation of special testing (e.g., toxicology).
- showing the ability to investigate cases utilizing textbooks and journals.
- demonstrating an understanding of the role that the circumstances of death play in the cause and manner of death.

Medical Knowledge:
- demonstrating an ability to glean from the detective and medicolegal investigators reports, the pertinent clinical and medicolegal questions to be addressed during the autopsy
- understanding the clinical and medicolegal significance of the diagnoses being made, including implications for family, treating physicians, law enforcement, and district attorneys.
- understanding the data elements which need to be included in the pathology report to provide the treating clinicians, police, family, and district attorney with the information they need for the subsequent medicolegal issues.
- recognizing and describing types of injury (blunt, sharp, burn, gunshot, asphyxia), cause and manner of death definitions and determinations, time of death issues, and interpretation of toxicology results.

Interpersonal and Communication Skills:

- demonstrating an ability to prepare and present cases at agency working conferences
- being available for court proceeding to observe medical examiner testimony

Professionalism:

- demonstrating a commitment to ethical principles (e.g., decedent confidentiality) and sensitivity to next of kin interactions.
- Understanding religious autopsy objection law and demonstrates sensitivity to family diversity during death investigation.

Systems-based Practice:

- collaborating with other members of the death investigation team to improve patient care, public health, and assist the legal system in relevant medicolegal issues

Cytology Service

Dr. David Chhieng, Director
Kevin Schofield, Manager

The Cytopathology division of the Department of Pathology at Yale-New Haven Hospital provides preparatory and diagnostic services for all fluid, smear and aspiration specimens. The service processes and reads approximately 89,500 specimens per year. Of these, around 4300 are non-gyn specimens, including about 2650 fine needle aspirations (FNAs) and 300 consults. The service also provides a pathologist-performed superficial FNA service at the request of physicians within the hospital. On site adequacy assessment and preliminary interpretation of ultrasound, CT, and EUS fine needle aspirations are provided by cytotechnologists and the cytopathology fellow.

The laboratory occupies about 700 sq. ft. on the second floor (EP2-612) of the East Pavilion in Yale New-Haven Hospital, where all non-GYN specimens are processed. About 1/3 of the space is devoted to the preparatory lab, while the remaining space is devoted to specimen review and signout by cytology attendings, fellows, residents and cytotechnologists.

The lab is equipped with a Cytyc Thin Prep processor and an AutoCyte Prep system for production of thin layer preps. This process facilitates collection of material for routine diagnostic work while saving otherwise discarded material for ancillary tests or research purposes. The lab also maintains all necessary equipment for routine processing and staining cytologic specimens. Additionally, Cytopathology occupies lab space at 430 Congress Avenue, where all GYN specimens are processed. There, we have two FocalPoint Primary Screening Instruments, one Cytyc Imager, two Cytyc ThinPrep processors, and two Autocyte Prep systems.

The laboratory interfaces with immunohistochemistry and the molecular diagnostics lab on a routine basis. Material collected for cytologic analysis may be sent to either of those labs as necessary.

The goals of the service include:

- To maintain excellence in specimen preparation and diagnostic accuracy
- To provide the highest quality consultative services to our clinical colleagues, both within our institution and elsewhere
- To develop and maintain excellent communications with patient care clinicians and consulting pathologists to enhance the reputation and recognition of the Yale Pathology Services
- To train residents, fellows, medical students and cytotechnologists in diagnostic cytopathology

- To support and incorporate advanced diagnostic techniques to improve diagnostic accuracy
- To pioneer new molecular techniques to increase the amount of information obtained from the minimal amounts of tissues received in the routine specimen

Cytology Rotation (AP-1 and AP-2)

Drs. David Chhieng, Diane Kowalski, Constantine Theoharis, Malini Harigopal, Adebowale Adeniran, Guoping Cai, and Angilique Levi

Residents training in anatomic or combined anatomic-clinical pathology will complete a minimum of two months of cytology training. This training is designed to provide a framework upon which to build, leading to possible sub-specialization and expertise as a cytopathologist. Residents are encouraged to do additional elective rotations in cytology if this is aligned with their future career interests.

The service is divided into three units, GYN, non-GYN, and FNA/consults with three attendings on service at all times. As the cytology fellow is an integral part of the cytology service, the resident will work closely with the cytology fellow, under direct supervision of the cytopathology attending, in training and performance of FNA biopsy, triaging of specimens, cytologic preview, case work-up, and communication with clinicians. The attending on service will review all aspects of the cases with the resident at the time of signout.

During the first days of the first rotation, the resident should spend a few hours in the prep lab with a senior cytotechnologist familiarizing themselves with the various laboratory techniques routinely used in preparation of both GYN and non-Gyn specimens. These include ThinPrep, SurePath, cell blocks, cytospins, smears, and routine stains such as Diff Quik.

The resident is responsible for previewing all non-GYN specimens and a portion of the GYN specimens, often in conjunction with the fellow, and will participate in daily signout. Signout for the non-GYN service may occur twice a day.

The resident will be instructed on proper FNA technique by the cytopathology fellow and on-service attending, and will be expected to perform 5 FNA biopsies over the two months of training. Before a resident may perform an FNA on a patient, initial instruction will include practice on a food item, followed by observation at the bedside. The resident will participate with the fellow in adequacy assessment of deep US, CT, and EUS-guided FNAs.

An abundance of teaching material is available in the cytology division including, glass study sets, books, journals, ASCP and CAP workshops, and unknown slides. The resident is expected to utilize these resources to enhance their cytology education. Residents are also expected to attend and participate in regularly scheduled cytology conference, including cytology-histology correlation, weekly consensus conference, and pertinent tumor boards.

<u>Additional Resident Duties and Responsibilities</u>

- Observe routine specimen preparation under the guidance of a senior cytotechnologist during the first week of the first rotation
- Attend daily signout
- Attend all cytopathology conferences
- Practice laboratory preparation of cytology specimens including PAP smears, FNAs, and fluids
- Practice smear techniques

• Practice FNA technique and attend patient FNAs with cytopathology fellow and attending
• Attend image guided, cytology assisted FNAs and observe preliminary assessment process

Additional Goals and Objectives for the Cytology Rotation

Patient Care:

- Understand the techniques used in cytopathology to obtain and preserve specimens, including conventional PAP smears, liquid-based PAP smears, fine needle aspiration, brush specimens, endoscopic ultrasound, bronchial alveolar lavage, and fluids (including urine, CSF, effusions, ascites)
- Understand the preparation of cytology specimens and slides, including PAP smears (Thin Prep and SurePath), HPV typing, touch preps, direct smears, and centrifugation.
- Understand commonly used stains, including, Diff Quik, H and E, PAP stain, special stains, and immunohistochemical stains; their limitations; and how they apply to cytopathology
- Triage the specimen appropriately for optimal diagnostic evaluation

Medical Knowledge:

- At the conclusion of the eight-week rotation, the resident should fully understand the morphologic criteria used to define normal, reactive, atypical, dysplastic, and malignant cells in common cytology specimens, including FNAs and fluids, and GYN specimens (CSF, thyroid, head and neck, breast, GI, GU, lymph nodes, fluids, soft tissue, bone), and GYN specimens
- Specific medical knowledge goals that should be attained at the **conclusion of the first four-week rotation include:**
    - Understand normal GYN, Non-GYN, and Fluid cytology
    - Understand and be able to apply the newly revised Bethesda system
    - Understand the diagnostic criteria for reactive changes, ASCUS, LGSIL, HGSIL, AGUS, adenocarcinoma, and squamous carcinoma in PAP smears
    - Understand the diagnostic criteria for atypical, dysplastic, and malignant non-GYN and fluid specimens
    - Understand the purpose of cytology-histology correlation and participate in monthly conference
- Specific medical knowledge goals that should be attained at the **conclusion of the second four-week rotation include:**
    - Accurately diagnose common abnormalities of the cervix, endometrium, vagina and vulva, including reactive processes, dysplasia and malignancy
    - Accurately diagnose common abnormalities in FNAs and fluid specimens including reactive processes, dysplasia, and malignancy
    - Present cytology teaching cases as necessary, with assistance from the cytopathology fellow, at tumor board and unknown resident conference
    - Review cytology consult cases with cytopathology fellow prior to signout with the attending
    - Understand the limitations of assessment of a disease process by cytopathology
    - Gain exposure to CPT and ICD-9 coding for common cytology specimens

Surgical Pathology Service *(Updated 2011)*

Dr. Brian West, Director
Lori Marini, Pathologist Assistant and Gross Room Manager
Andrew Imperati, Pathologist Assistant

Jamie Santanello, Pathologist Assistant
Keri Stratton, Pathologist Assistant
Christopher Sylvest, Pathologist Assistant
Nicole Wittenzellner, Pathologist Assistant

The Surgical Pathology Service renders tissue diagnosis on biopsy samples and studies surgical resection specimens in an accurate and timely fashion. The service is staffed by several attending Pathologists, residents, and fellows. This service entails all facets germane to the evaluation of surgical specimens, including prosection, interpretation, communication, and report generation. As members of a tertiary care center, residents are exposed to a vast spectrum of material. The resident is responsible for each case assigned to him/her and, with supervision by a faculty member, initiates all studies necessary for the completion of a case, including utilization of all available ancillary studies and molecular technologies. Areas of intense sub-specialization include the fields of genitourinary pathology, endocrine pathology, orthopedic tumors, lung pathology, and ENT pathology. As residents accrue experience from the first to second years, they are given increasing responsibilities in this setting. The residents interface with numerous faculty members and experience ongoing evaluation and input that culminates in a formal written evaluation. The ultimate goal for this area is to produce experienced, qualified Surgical Pathologists who will have a solid foundation on which to build their careers and who will appreciate the need for consultation.

Because of the specialized nature of the clinicians who avail themselves of the expertise of the staff, the service is organized in programs that focus on one organ or specialty. Depending on the caseload for each individual program, the residents will be assigned to one rotation or a combination of rotations that optimizes the learning experience and the smooth functioning of the service.

Each incoming case is assigned to a resident (AP-1 or AP-2) and an attending who will be responsible for the final report. The average time for a final diagnosis rendered on a biopsy is 24 hours; for resection specimens, it is two to four days. When cases demand a work-up that will prolong the turn around times, a provisional report may be issued and/or the attending will be notified by telephone. The senior resident assigned to the “hot seat” reviews every case and acts as focal point for the communication and exchange of information with the clinical staff.

The medical staff in surgical pathology is supported by the technical group in the gross room, the Histology Laboratory, the laboratory information system, and the report generation unit. Separate summaries are provided in this manual for the histology laboratory and computer services. The gross room group is responsible for the intake of cases and helping the medical staff with the grossing and work-up of the specimens. A manual devoted to gross room procedures is distributed separately. First year residents must be directly supervised in the dissection of at least their first three cases of each of the specimen types identified on the Resident Supervision Documentation Form for surgical pathology, and document that supervision on that form. Harmonious cooperation between the Histology Laboratory and the Yale Pathology Tissue Services staff optimizes the collection of samples for scientific purposes without compromising patient care.

After a specimen has been accessioned and subsequently “grossed” by a resident or Pathologist Assistant, a secretary transcribes the gross dictations. The Hot-Seat reviews the paperwork and slides and formulates a preliminary diagnosis. A final diagnosis is generated after further review by the resident and attending. The final reports are electronically signed out by the attendings and copies are sent to attending physicians and medical records.

It is very important for patient care to maintain continuity of knowledge about a specimen. When a resident has grossed in a specimen, that specimen remains the responsibility of that resident until a) it has been signed out, or b) responsibility has been formally transferred to another resident. Transferring responsibility occurs most commonly when one resident is rotating off service and another is rotating on, but also occurs when a specimen is referred to a different specialty service for signout. It is not sufficient to simply "pass on" the slides to the new resident. The resident transferring the case must organize the case and sit with the resident transferee and clearly communicate how the specimen was grossed in and what workup, if any, has been initiated for the case. See the Handoff Policy for more information.

Rotation Redesign to Maximize Teaching

The volume of surgical material being evaluated by most pathology departments has been steadily increasing over the past several years. However, in most programs, the number of residents has not been increasing. As a result, residents are interacting with more and more specimens each year. Although this increased exposure provides new and important learning opportunities, volume overload can ultimately compromise training.

In response to this growing workload, the Resident Education Committee in Anatomic Pathology recommended redesign of each of the surgical pathology rotations to create two paths for specimens through the department: one path involving the residents, and one by-passing the resident, so that resident workloads remain reasonable. *This process is complex and is currently underway*. The Education Committee has developed guidelines for rotation directors to use in the redesign process. They are:

Residents must be directly and actively involved in all aspects of the real-time evaluation of active cases within the department.

It is not necessary for a resident to be involved in every case that comes through the department; however, guidelines need to be in place to ensure adequate exposure to neoplastic as well as non-neoplastic lesions specific to each specialty service. Typically, residents should be involved with all malignant resections (up to a reasonable volume limit).

Residents should be fully responsible for all cases they gross in until they are signed out with the attending. Residents are expected to be able to converse intelligently about their cases with the attending pathologist as well as residents and clinicians in other departments. Therefore, residents must routinely be given time to preview slides on all cases they gross in BEFORE taking them to signout. Residents must accomplish this in a timely fashion to prevent delays in the care of the patients. Previewing should include writing up the case, correcting the paperwork, pulling relevant prior material, and reading about the cases as appropriate. Exceptions may occur at the time of change in rotation, in which case a resident leaving a surgical service may sign-over a case to the resident coming on to the service.

Decisions about which specimens take a resident path and which take a non-resident path should be determined on a per-service basis and based on the educational value/need for the specimen. These decisions may take into account level (year) of training but should NOT vary based on the interests, efficiency or skill of a particular resident (all residents of equivalent training level should be held to the same standard) or on non-educational factors, such as who the submitting physician is.

There must be a mechanism to identify unusual and highly educational specimens that take the non-resident pathway to ensure resident exposure.

Rotations should be designed to provide the resident with a balanced exposure to all stages of the diagnosis, evaluation, and treatment of disease. This should include thorough exposure to primary biopsies (in which a diagnosis has not yet been made), involvement in selection and interpretation of ancillary techniques, evaluation of definitive resections, and participation in multidisciplinary clinical conferences. Opportunities for direct communication with clinicians should be encouraged.

Bone and Soft Tissue (Neoplastic) Pathology Rotation (AP-1 and AP-2) *(Updated 2011)*

Dr. Jose Costa

The bone and soft tissue rotation at YNHH encompasses a wide variety of specimens, including sarcoma resections, amputations, and smaller benign lesions. The residents should familiarize themselves with a differential diagnosis starting with the gross specimen in order to utilize appropriate ancillary testing such as saving fresh tissue for cytogenetic analysis or performing radiographic examination of bone lesions. Correlation with radiographic studies is mandatory for the diagnosis of bone and often necessary for soft tissue lesions.

Additional Resident Duties and Responsibilities

- Review/obtain available imaging studies for cases as needed
- Procure fresh tissue from cases for appropriate ancillary studies
- Attend the biweekly musculoskeletal tumor board
- Ready the case to be signed out in CoPath at the time of sign-out. This can be done directly by the house-staff or through transcription

Additional Goals and Objectives for the Bone and Soft Tissue Rotation

Patient Care:

- Understand commonly used techniques, including safe use of the band-saw, cytogenetics, electron microscopy
- Learn to develop an appropriate differential diagnosis and utilize radiologic techniques to narrow the differential and arrive at the most likely diagnosis
- Learn the role of the pathologist as a consultant participating in the care of patients with musculoskeletal tumors

Medical Knowledge:

- The resident should demonstrate an appropriate level of understanding of the pathogenesis, clinical significance, treatment and prognostic factors of the major pathologic entities covered on this service, including the role of chromosomal translocations in the etiology of these neoplasms

Breast Pathology Rotation (AP-1 and AP-2) *(Updated 2011)*

Drs. Fattaneh Tavassoli, Veerle Bossuyt, Natalia Buza, Kenneth Haines, Malini Harigopal, Sihem Khelifa, and Ozlen Saglam

The specimens removed from the breast form the basis of a rotation, in which both AP-1 and AP-2 residents participate. The purpose of the rotation is to examine and accurately diagnose these cases, to become acquainted with the processing of specimens derived from the breast, and to understand the diagnostic features and clinical implications of the surgical pathology of the breast.

The resident is guided by the Pathology Grossing Manual, Pathology Assistants, the senior residents, the fellow, and the attendings in learning the processing of specimens. Much of the teaching occurs at the multi-headed microscope, but to help the resident gain an understanding of these features, there is a series of both didactic and case-based conferences held throughout the year dealing with breast pathology. An understanding of the clinical implications is gained by attendance at the weekly Breast Tumor Board, which meets on Wednesdays, and the monthly Breast/GYN Journal Club.

The goals of the resident on this service can be divided into AP-1 and AP-2 levels. The AP-1 resident should be able to describe the grossly observed pathologic changes in relation to the anatomy of the structures in which they are found. The resident should be able to concisely describe the lesion verbally and accurately photograph the pathologic features in relation to the anatomic structures that have been removed. Quality photography is a major element used to evaluate residents' performance. In addition, the resident should be able to demonstrate the pathology efficiently with well-preserved and well-chosen blocks. They should know the pathologic entities that occur and the diagnostic criteria for distinguishing them. The resident should also work up the cases and present the pertinent clinical and previous pathologic material at the time of signout. In addition to these goals, the AP-2 resident is expected to regularly apply the diagnostic criteria and have an understanding of the clinical significance of distinguishing the pathologic entities. Additionally, the AP-2 resident should understand assays and their interpretation as utilized to acquire additional prognostic and therapeutic information such as ER/PR status, Her2/Neu expression, Oncotype DX, and DNA flow cytometry ploidy studies.

Additional Resident Duties and Responsibilities

- attend Breast Tumor Board and Breast/GYN Journal Club
- pull slides of prior biopsies for all cancer cases
- use the digital X-ray equipment when mammographically detected microcalcifications are not identified grossly to localize calcifications and lesions in various specimens; all cases with multiple lesions should have confirmation by imaging
- take quality gross photographs of the cut surface of all major lesions

Additional Goals and Objectives for the Breast Rotation

Patient Care:

- becoming proficient in the standard techniques for the gross evaluation, dictation, and dissection of breast mastectomy, lumpectomy, reduction mammoplasty, core biopsies, and sentinel & axillary lymph node dissections specimens, paying particular attention to issue of diagnostic and prognostic significance
- appropriately handling implants, implant capsules, titanium clips, handling of cores with microcalcifications, sentinel node processing, touch preps, whole mounts

Medical Knowledge:

- By the end of the **first rotation**, recognize, understand the diagnostic criteria for, and be able to accurately diagnose the following lesions:
  - Normal structure of the mammary duct system
  - Spectrum of fibrocystic changes
  - Physiologic alterations: Gestational Hyperplasia, Lactational changes, Involution
  - Benign Lesions:
    - Sclerosing Adenosis and variants
    - Radial scar
    - Gynecomastia
    - Pseudoangiomatous stromal hyperplasia
    - Fibroadenoma
    - Nipple duct adenoma
    - Fat Necrosis, various types of mastitis
    - Location of and lesion associated with microcalcifications; types of calcifications
  - Lobular intraepithelial neoplasia and variants
  - Spectrum of Ductal intraepithelial neoplasia (flat type, grades 1 – 3) / IDH, AIDH, DCIS
    - Grading of DIN, tumor extent/size assessment, margin assessment

- Carcinomas
    - Microinvasive, Invasive
    - Ductal/Lobular
    - Clinical significance of special types (Tubular, adenoid cystic, mucinous, cribriform, medullary, secretory)
    - Inflammatory carcinoma
    - ER/PR/HER2, Immunohistochemistry, and FISH
    - Lymphovascular invasion
    - Margin status
    - Grading of carcinomas
    - TNM/staging of carcinomas
    - Sentinel lymph node assessment
- Papilloma, atypical papilloma, and papillary intraductal carcinoma (criteria for diagnosis)
- Biphasic Tumors:
    - Fibroadenoma (adult and juvenile)

• By the end of the **second rotation**, in addition to the above, recognize, understand the diagnostic criteria for, and be able to accurately diagnose the following lesions:

- Morphologic diagnosis of special types of carcinoma (Tubular, adenoid cystic, mucinous, cribriform, medullary, secretory)
- Biphasic Tumors:
    - Phyllodes Tumor
    - Periductal stromal tumors
- Mesenchymal tumors:
    - Benign
        - Myofibroblastoma/Fibromatosis
    - Malignant:
        - Angiosarcoma (de novo and post-radiation)
        - Other soft tissue sarcomas (liposarcoma, fibrosarcoma, osteogenic sarcoma)
- Additional carcinomas of special types:
    - Metaplastic carcinomas
    - Signet ring cell carcinoma
    - Carcinoma presenting as an axillary mass

Dermatopathology Rotation (AP-2)

Dr. Rossitza Lazova and Faculty

Residents are exposed to dermatopathology specimens from two different sources. Specimens resulting from surgery in the YNHH operating rooms come to surgical pathology. This consists mostly of resections of cutaneous malignancies with some additional biopsies mixed in. In addition, residents rotate through the Yale Dermatopathology Laboratory within the Department of Dermatology, where approximately 70,000 specimens per year are interpreted.

Residents' responsibilities include participating in the daily sign-out of dermatopathology specimens, as well as researching interesting cases, gathering cases for teaching purposes, and preparing and presenting occasional talks. In addition, residents are also expected to review teaching sets with examples of different neoplastic and inflammatory conditions.

During a typical morning, the resident handles specimens received in Pathology, and signs out with a dermatopathology faculty member each day. Many cases may be signed out with other Pathology faculty. In the afternoon, the resident reviews and attends signout of cases in Dermatopathology.

The didactic teaching program in Dermatopathology for the dermatology residents consists of a weekly conference, which throughout the academic year covers major topics in dermatopathology. A small number of these conferences are mandatory for pathology residents. However, all of these conferences are open to the pathology residents. Pathology residents should attend these conferences while on Dermatopathology rotation. Reading material is assigned prior to the conference and residents are encouraged to review the slides and be prepared to discuss them during conference. These didactic sessions are conducted largely by Yale's board-certified dermatopathologists, one Yale-affiliated board-certified dermatopathologist from the community, and the dermatopathology fellow. There is also once or twice a month slide review and teaching conducted by the dermpath fellow with review of a variety of interesting cases collected during the preceding month. Additional lectures in Dermatopathology are given throughout the year on a variety of topics in skin pathology, specifically for the pathology residents. Residents also have the opportunity to review two large study sets, often with the guidance of a dermatopathologist or the dermpath fellow.

Additional Resident Duties and Responsibilities while on the Dermatopathology Rotation

- Attend Dermatology Grand Rounds
- Attend all of the weekly dermatopathology conferences

Additional Goals and Objectives for the Dermatopathology Rotation

Patient Care:

- Mastering skills needed to correctly orient and gross skin specimens:
    - Proper fixation and dissection
    - Appropriate usage of cassettes and an understanding of tissue processing
    - Ability to know limitations, seek help from the fellow or attending prior to grossing

Medical Knowledge:

- Expected fund of knowledge:
    - Inflammatory conditions
        - Know criteria for psoriasis and eczematous dermatitis
        - Know criteria for Graft vs Host disease and differential diagnosis with drug eruption and erythema multiforme
        - Know histologic features for Lupus erythematosus and Dermatomyositis
        - Know how to differentiate toxic epidermal necrolysis from staph scalded skin syndrome on frozen and permanent sections
        - Recognize common inflammatory patterns of cutaneous infections on routine and specially stained sections
    - Neoplastic conditions. Know the characteristic histologic features of…
        - melanocytic nevi and malignant melanoma
        - basal cell carcinoma and distinction from benign tumors of the hair follicle
        - squamous cell carcinoma, and distinction from pseudoepitheliomatous hyperplasia
        - common benign conditions such as epidermoid cysts, hemangiomas, acrochordons and dermatofibromas

Endocrine and Head & Neck Pathology Rotation (AP-1 and AP-2)

Drs. Manju Prasad, David Chhieng, Diane Kowalski, Constantine Theoharis, and Joanna Gibson

During this rotation, the resident is exposed to the pathology of thyroid, parathyroid and adrenal glands, and of upper aerodigestive tract including oral and sinonasal cavities, salivary glands, pharynx and larynx. Pathology of bone and soft tissues of the head and neck including jaw cysts and tumors is also included. YNHH has one of the most active endocrine surgery services in the country, so a large variety of pathology is encountered. The head and neck oncology service is a referral center for the region and attracts many complex and rare cases. During this rotation, clinical, radiological and cytology correlation with surgical pathology is emphasized.

Additional Resident Duties and Responsibilities

• Attend Endocrine and ENT Tumor Boards and Thyroid Cytology Conference

Additional Goals and Objectives for the "Endocrine/H&N" Rotation

Patient Care:

- Become proficient in the standard techniques for the gross evaluation, dictation, and dissection of specimens from:
    - ENT: Laryngectomy, Neck Dissection, Tongue/FOM, Salivary Gland
    - Endocrine: Thyroid, Adrenal, Parathyroid

  Emphasis is placed on issues of diagnostic and prognostic significance
- The resident is expected to learn and apply the nuances of the complex AJCC staging system pertaining to these organs

Medical Knowledge:

- The resident should demonstrate an appropriate level of understanding of the pathogenesis, clinical significance, treatment and prognostic factors of the major pathologic entities covered on this service

Gastrointestinal and Liver Pathology Rotation (AP-1 and AP-2)

Drs. Dhanpat Jain, Marie Robert, Kisha Mitchell, Joanna Gibson, Bart Kenney, and Brian West

During this rotation, the resident is exposed to the interpretation of gastrointestinal and liver pathology and has an opportunity to examine a wide range of biopsy and resection specimens. Emphasis is placed on correlating the clinical findings and endoscopic appearance of the lesion with the histopathology. The importance of a good working relationship and excellent communication with clinicians is vital to giving good patient care on this service.

In addition, residents are encouraged to participate in on-going clinical research with the faculty and to start their own projects under the guidance of faculty. The GI service offers a series of didactic and case based conferences throughout the year, which cover a broad range of aspects of GI and liver diseases. Residents may also participate in the GI Journal Club, which meets on a monthly basis.

Additional Resident Duties and Responsibilities

• Residents are expected to have looked at all slides for their cases prior to signout
• Read standard GI texts on cases as needed prior to signout
• Utilize AJCC manual to accurately stage all resections of carcinomas of the gastrointestinal tract
• Be prepared to discuss diagnosis and medical implications of the diagnosis during signout
• Participate in journal club presentations
• Assist in teaching medical students that rotate on the service

Additional Goals and Objectives for the Gastrointestinal Pathology Rotation

Patient Care:

- Becoming proficient in the standard techniques for the gross evaluation, dictation, and dissection of gastrointestinal, liver and pancreaticobiliary specimens, paying particular attention to issue of diagnostic and prognostic significance
- Master skills needed to correctly dissect gastrointestinal specimens in the gross room, including:
    - Correct fixation and sampling of tissue
    - Correct usage of cassettes and an understanding of tissue processing
    - Ability to know when to seek help from the fellow or attending prior to grossing in specimens
- Learn CPT and ICD-9 codes and apply to each case
- During the **second rotation**:
    - Participate in journal club presentations
    - Assist in teaching medical students that rotate on the service

Medical Knowledge:

- Specific Medical Knowledge in the field of gastrointestinal pathology that is required during **first rotation** includes:
    - Inflammatory conditions
        - Criteria for diagnosis of reflux esophagitis
        - Gastritis- including H. pylori and NSAID injury
        - Celiac disease
        - Colitis, including distinguishing acute self limited from idiopathic inflammatory bowel disease
        - Common GI infections, both immunocompetent and immunocompromised hosts
        - Chronic hepatitidies
        - Ancillary studies of use in the above conditions
    - Neoplastic conditions
        - Intestinal metaplasia and dysplasia in the esophagus and its meaning
        - Squamous cell carcinoma of the esophagus
        - Colonic polyps, including hyperplastic polyps, adenomas, and inflammatory polyps
        - Adenocarcinoma of the tubular GI tract
        - Pancreatic adenocarcinoma
        - Tumor types common to the pancreas
        - Gastrointestinal stromal tumors
- Specific medical knowledge that is required of the resident on their **second GI rotation** includes, in addition to those listed above:
    - Inflammatory Conditions:
        - Be able to diagnose all usual chronic hepatitidies and write a complete report
        - Be fluent in liver transplant pathology
        - Be able to distinguish colitidies, including microscopic, ischemic, infectious, IBD and graft versus host disease
    - Neoplastic conditions:
        - Be able to fully discuss and diagnose GI stromal tumors and sarcomas
        - Be able to diagnose liver tumors and tumor-like lesions, including focal nodular hyperplasia, hepatic adenoma, hepatocelluar carcinoma, and cholangiocarcinoma
        - Be able to distinguish mucinous cystic neoplasms of the pancreas from intraductal pancreatic mucinous tumor.

Gynecologic Pathology Rotations (AP-1 and AP-2)

Drs. Fattaneh Tavassoli, Kenneth Haines, Pei Hui, Veerle Bossuyt, Natalia Buza, Sihem Khelifa, and Ozlen Saglam

The experience in this rotation encompasses reproductive and gestational pathology and the pathology of gynecologic disease. Emphasis is placed on recognition of common gynecologic tumors, and the Pathologist's role in the management of these tumors. A major clinical program in gynecologic oncology provides the setting for the development of the residents as consultants for the gynecological surgeon.

Residents do two rotations in gynecologic pathology during their AP-1 and AP-2 years. A large variety of gynecologic specimens consisting of surgical specimens and biopsies comprise the surgical material. Most of the in-house specimens will be grossed in by the resident on the service. Most of the biopsies will be grossed in by technicians.

For those residents interested, they can do an additional elective rotation in "outreach GYN", reviewing biopsy specimens received by the department from physicians' offices.

Gestational pathology specimens such as products of conception are shared between the GYN service and the pediatric service. For cases in which a termination is done for suspected or known genetic abnormalities, the specimens go to the pediatric pathology service. Always read and understand the clinical questions first before grossing the specimens. If the clinical information is not clear, call the physician and clarify.

As with all the surgical pathology services, residents are expected to have previewed their slides prior to bringing them to sign-out, to have formulated a preliminary impression/diagnosis for the case, and to have all the paperwork in order, with appropriate **previous material available for review**.

Additional Resident Duties and Responsibilities

- Attend the weekly GYN-Oncology Tumor Board Conference
- Use standardized forms/synoptic reports for signing out all tumor cases. They are stored in the signout area and in the copy room
- Fee codes and ICD-9 codes should be entered before signout.
- In cases of Pap smear discrepancy, the resident should inform the attending at signout. These cases should be brought to the attention of the cytopathologist for review. The attending on service will decide if the cases should be included for cytology-histology correlation conference.
- The resident will maintain a log of all special stains and studies for each case. A copy of the report should be attached to all special stains when presented for review. Follow up on POC specimens for which flow cytometry has been ordered and check back on a regular basis and report on the results with special reference to discrepancies if any.
- Photograph ALL carcinomas and unusual tumors
- Attend gyn/Breast Journal Club
- Pull slides of prior biopsies for all cancer cases

Additional Goals and Objectives for the Gynecologic Pathology Rotation

Patient Care:

- Become proficient in the standard techniques for the gross evaluation, dictation, and dissection of conization specimen; hysterectomy specimen for benign and malignant epithelial and/or mesenchymal tumors; oophorectomy specimen for benign and malignant lesions; cancer

staging procedures; partial and complete vulvectomy samples; biopsies and curettings, paying particular attention to issues of diagnostic and prognostic significance (e.g., complete distortion of uteri or vulvar specimen by massive benign or malignant lesions)

Medical Knowledge:

- At the end of their **first** rotation, residents should be able to recognize, understand the diagnostic criteria for, and accurately diagnose the following lesions:
  - Vulvar intraepithelial neoplasia
  - Classic and differentiated variants of vulvar intraepithelial neoplasia
  - High and low grade squamous intraepithelial lesions of the cervix Non-neoplastic changes: including atrophy, reactive/reparative changes, radiation effect, implantation site, adenocarcinoma in situ of the cervix, benign glandular cell changes, including tubal metaplasia, reactive changes, benign hyperplasia of the cervix (1^{st})
  - Adenocarcinoma of the cervix
  - Cycling endometrium
  - Endometrial stromal breakdown
  - Endometriosis
  - Endosalpingiosis
  - Changes associated with dysfunctional uterine bleeding
  - The range of endometrial metaplasia and its significance
  - Criteria for distinguishing endometrial glandular from mixed glandular/stromal (carcinosarcoma) tumors
  - Biomarkers distinguishing endometrial stromal from myometrial smooth muscle neoplasms
  - Variants of leiomyoma, including degenerated leiomyoma, mitotically active leiomyoma, plexiform leiomyoma, lipo-leiomyoma, symplastic leiomyoma
  - Criteria for distinguishing smooth muscle tumors of uncertain malignant potential (STUMP) and leiomyosarcoma
  - Chronic salpingitis Common ovarian structures, including cystic follicle, follicle cyst, corpus luteum, cortical inclusion cysts, endometrioma, endometriosis, adhesions, hilus cell hyperplasia, cortical stromal hyperplasia, theca-lutein hyperplasia of pregnancy
  - Borderline serous tumors
  - Endometroid cystadenofibromas
  - The spectrum of endometroid ovarian neoplasms, including endometroid adenofibromas, endometroid carcinomas with sex cord growth patters, clear cell carcinomas arising in endometriosis
  - Benign, proliferative and malignant Brenner tumors
  - Criteria for grading immature teratomas
  - The ten most common benign placental disorders and their clinical significance, including those associated with systemic and local infection, toxemia, growth retardation, genetic syndromes
  - The distinction between uterine papillary serous and endometroid carcinoma (clinical significance) Type I & Type II
  - Benign, borderline, malignant and early malignant (intraepithelial carcinoma) mucinous neoplasms
- At the end of their **second** rotation, residents should be able to recognize, understand the diagnostic criteria for, and accurately diagnose the following lesions:
  - Paget's disease and melanoma
  - Condylomas

- The distinction between uterine papillary serous and endometrioid carcinoma (morphologic criteria) Type I and Type II
- Macro and micro-glandular patterns of endometrioid carcinoma; Endometrial vs. Endocervical Primary
- The distinction of stromal nodule from endometrial stromal sarcoma
- The distinction of adenosarcoma from polyp
- The distinction of atypical polypoid adenomyoma, endometrial polyp and adenomyoma
- Non-invasive desmoplastic from invasive desmoplastic peritoneal serous implants
- Serous ovarian from primary peritoneal serous carcinomas
- Benign, borderline, malignant and early malignant (intraepithelial carcinoma) mucinous neoplasms
- Criteria for distinguishing primary from potentially metastatic ovarian neoplasms including biomarkers used for this purpose
- Trophoblastic disease
- Hyperplasias

Hematopathology Rotation (AP-2)

Drs. David Hudnall, Mina Xu, and Demetrios Braddock

The resident is crucial to this service, organizing all information regarding wet hematologic cases and initiating phenotyping and genotyping studies on lymphomas. A wide spectrum of material, both in-house and consultative, is available due to the variety of patients attracted to YNHH. Thus, residents experience diverse exposure to histologic material and become conversant in the rapidly evolving field of molecular hematopathology. Residents also have access to a vast teaching collection. Evaluation and constant guidance are ongoing. The goal of this rotation is to assure adequate exposure in hematopathology for general surgical pathologists as well as to afford a very strong foundation for those residents wishing to specialize in this field.

Ancillary studies are integral to the workup of most hematopathology cases. The resident will be expected to participate in the evaluation of all components of a case, including those portions performed in Laboratory Medicine. This rotation, thus, routinely bridges the AP and CP training experiences.

Additional Resident Duties and Responsibilities

- Attend the weekly hematology/oncology conference
- When not handling cases in surgical pathology, participate in the evaluation of other parts of these cases in Laboratory Medicine

Additional Goals and Objectives for the Hematopathology Rotation

Patient Care:

- Become proficient in the standard techniques for the gross evaluation, dictation, and dissection of lymph node/spleen specimens, paying particular attention to issues of diagnostic and prognostic significance
- Understand techniques commonly used in working up hematopathologic cases such as classic morphology, immunohistochemistry, flow cytometry, FISH, cytogenetics, EM, Frozen sections, smears, and touch preparations

Medical Knowledge:

- Understand the clinical and pathologic criteria used to distinguish reactive from malignant lymph nodes, phenotype and genotype lymphomas, apply cytogenetic results to diagnoses, stage lymphomas, diagnose etiologies for anemia, understand myelodysplastic syndromes and leukemias, and evaluate the effects of treatment and therapy on lymph node, splenic, and bone marrow pathology

Introduction to Clinical Pathology Rotation (AP-1) *(New 2011)*

Laboratory Medicine Faculty

Since many AP/CP residents do not get any significant exposure to CP until their third year of training, and most AP-only residents do not get any significant exposure to CP at all, we have created a one-week rotation experience designed to introduce PGY-1 residents starting in AP to the various aspects of clinical pathology. Through this experience, residents will learn the structure of the clinical labs at Yale and the VA, allowing them to more effectively draw upon these resources as needed during their training and for the workup of their cases. Some residents may discover that they have significant interest in some aspect of Clinical Pathology and elect to do their second year of training in CP rather than in AP, an arrangement that is particularly advisable if the resident believes he or she may be interesting in a CP-based fellowship following residency training.

During the one-week rotation, the resident will spend each day in a different laboratory, accompanying the resident assigned to that laboratory while they perform their clinical duties and attending any meetings pertinent to that lab. Since different labs have different activities on different days of the week, the rotation has been designed to maximize the experience of the resident, in particular allowing the resident to attend the Chemistry Director's Didactic Conference, the Micro Virology/Parasitology rounds, and the VA test of the week: Monday – Blood bank; Tuesday – Chemistry; Wednesday – Heme/Flow; Thursday – Microbiology; and Friday – VA Hospital. The resident is also encouraged to attend CP morning conferences and journal club (if it coincides with that week).

Additional Resident Duties and Responsibilities

- Shadow the daily activities of the resident assigned to the clinical laboratory for each day
- Attend morning CP conference

Additional Goals and Objectives for the Clinical Pathology Rotation

Patient Care:

- understand the scope of testing available
- understand the structure of laboratory medicine, and whom to call for specific issues

Practice-based Learning and Improvement:

- appreciate the role of the clinical laboratories in the overall care of patients

Molecular Pathology Rotation (AP-1) *(Updated 2011)*

Drs. Pei Hui, Anitha Kamath, Zenta Walther, and Jeff Sklar

As part of a program to introduce trainees to the evolving and expanding diagnostic repertoire available in the practice of pathology, residents will participate in a one week rotation in the anatomic pathology molecular diagnostics laboratory and the Yale-New Haven Hospital tumor profiling laboratory. This rotation is combined with a one-week exposure to clinical pathology (See

Introduction to Clinical Pathology). During the rotation, residents will observe a number of technical procedures, not with the goal of being able to perform them themselves, but rather aimed at gaining an understanding of the techniques involved and thus the capabilities and limitations of the techniques and possible areas of technical failure. Residents will be provided with a list of activities they are expected to observe over the course of the week, and it is there responsibility to work with the faculty, Molecular Genetics Fellow, and technical staff to complete this list.

Additional practical exposure to molecular pathology is available as an elective.

Additional Resident Duties and Responsibilities

- Shadow the daily activities in the clinical molecular diagnostics laboratory
- Read papers as assigned
- Attend the weekly molecular signout

Additional Goals and Objectives for the Molecular Rotation

Patient Care:

- understand the scope of molecular tests available in the molecular diagnostics lab
- understand how to interpret the data resulting from these tests
- appreciate the limitations of the techniques and pitfalls of the interpretations

Practice-based Learning and Improvement:

- Begin to appreciate the value of ancillary testing beyond the traditional gross and histologic examination of the specimen

Neuropathology Rotation (AP-2) *(Updated 2011)*

Drs. Alexander Vortmeyer and Anita Huttner

Training in neuropathology includes both surgical and autopsy neuropathology. During surgical neuropathology training, the neuropathology resident has the opportunity to see many interesting and unusual in-house neurosurgical cases. In addition, the neuropathology faculty receives numerous extramural consultation cases, which are often diagnostically challenging and highly educational. The neuropathology resident receives training in the special handling of certain neurosurgical cases, including the peripheral nerve and skeletal muscle.

Autopsy neuropathology is learned at the weekly "Brain Cutting" gross conference, where one of the residents on the autopsy service describes the gross findings of postmortem brains and takes sections of the brain for histological evaluation. The resident on the neuropathology rotation should attend this conference when possible.

The neuropathology resident is responsible for preparation of cases for conferences, particularly the weekly neuro-oncology tumor board, neurosurgical morbidity and mortality conferences, and pediatric tumor board. Less frequently, cases need to be prepared for the pediatric discharge conference, for the pediatric intensive care conference and rheumatology conferences. Regular neurology and neuromuscular conferences may be introduced in the future. For the neurosurgical M&M conference, the neuropathology resident prepares a PowerPoint presentation with photomicrographs.

Handling of specimens for neuropathology is not, in general, different from those for other subspecialties. However, there are some specimens (peripheral nerve, skeletal muscle) that need to be

treated differently. Details of these specimens are described in the Grossing Manual, and the resident is expected to be familiar with the special handling these specimens require.

Additional Resident Duties and Responsibilities

- Preparation of slides and digital photographs for different case conferences
- Take over cases still pending at the beginning of the rotation and follow them through to completion

Additional Goals and Objectives for the Neuropathology Rotation

Patient Care:

- Understand uniqueness of neuropathological evaluation in CNS disorders
- Acquire appropriate history or other laboratory data, including imaging, and be able to acquire information from charts, clinicians, or other related personnel before signing out cases with an attending.
- Be able to technically handle different types of tissue (muscle, nerve, CNS and PNS, for example) proficiently including preparations for histochemistry and ultrastructural studies
- Digital photography of gross specimens (neuropathology specimens are frequently small and subject to numerous ancillary studies; documentation and visualization of size and shape is frequently useful

Medical Knowledge:

- Demonstrate appropriate knowledge of normal anatomy, histology and biology of the nervous system, and skeletal muscle.
- Understand the reason why various routine histochemical and enzyme histochemical stains are needed for the evaluation of the skeletal muscle
- Develop knowledge on histological and biological differences among common brain tumors, and on the principle of histological grading, if applicable.
- Be able to describe salient neuropathological features in various neurological disorders including neurodegenerative and metabolic disorders

Ophthalmic Pathology Rotation (AP-1 and AP-2)

Dr. John Sinard and attending staff

Ophthalmic pathology represents a subspecialty area both because of the number of entities which occur uniquely in the area and because of the somewhat esoteric vocabulary associated with the discipline. Since the specimen volume is small, these specimens are handled by the resident on the "TGUM" surgical pathology rotation or on the Dermatopathology rotation (for eyelid lesions). Many of the cases, such as eyelid biopsies and temporal artery biopsies, can be signed out directly with these attendings. Other cases more unique to the eye, such as corneas, some conjunctival biopsies, and most lesions of the globe are routinely signed out with Dr. John Sinard, who is also happy to look at any other peri-orbital specimens.

The resident is exposed to a wide array of neoplastic and non-neoplastic pathology with study sets supplementing this material. The goal of this rotation is to assure some exposure to the field of ophthalmic pathology, which may be enhanced with additional training.

Additional Resident Duties and Responsibilities

- for specimens which will not be signed out by the attending pathologist on the General rotation, contact Dr. Sinard and arrange for timely signout of the material

Additional Goals and Objectives for the Ophthalmic Pathology Rotation

Patient Care:

- becoming proficient grossing specimens from the eye and peri-orbital region

Medical Knowledge:

- learning ophthalmologic terminology and abbreviations

Interpersonal and Communication Skills:

- working with the ophthalmology resident assigned to the service to interpret clinical histories and clinical differential diagnoses

Placental Pathology Rotation (AP-2) *(New 2011)*

Dr. Brian West (Acting Pediatric Pathologist)

General pediatric surgical specimens are handled by the individual sub-specialty teams at both the resident and attending levels, with the exception of placentas and fetuses less than 20 weeks of gestational age which are signed out by Dr. West. The resident on the placenta service is also on the Neuropathology and Bone and Soft Tissue rotations.

The department receives a high volume of placentas. It is not necessary for residents to participate in the gross and/or microscopic examination of every placenta received in order to obtain a fundamental grasp on placental pathology. Residents focus on the placentas from cases with obstetric complications and on multigestational births, and the bulk of the routine material is grossed by the pathologist assistants and signed out directly by the attending pathologist.

Examination of material from intrauterine fetal demises and elective terminations prior to 20 weeks gestational age can provide important information for the mother which may directly pertain to future pregnancies. While the surgical pathology evaluation of these products of conception is not as extensive as when these cases are examined on the autopsy service, it is crucial not to overlook important abnormalities, even in non-intact remains.

Additional Resident Duties and Responsibilities

- Attending and presenting intra- and interdepartmental conferences, as appropriate for the material with which the resident was involved

Additional Goals and Objectives for the Placental Pathology Rotation

Patient Care:

- Becoming proficient in the standard techniques for the gross evaluation, dictation, and dissection of perinatal and placental specimens, paying particular attention to issues of diagnostic and prognostic significance. Residents need to keep in mind that the key word in this rotation is DEVELOPMENT. Preservation of visceral relationships is essential in order to recognize deviations from the normal anatomy
- Knowing special techniques to dissect and submit sections for complex developmental disorders (including dysmorphic fetuses and abnormal placental vascular anastomoses).
- Recognizing when to submit specimens for special molecular techniques required in pediatric specimens (cytogenetics, flow cytometry, electron microscopy, molecular studies, tissue culture and microbiology studies). Chromosomal and molecular genetic analyses are extremely important in the diagnosis and treatment of many pediatric disorders. Complete and partial moles require molecular analysis, and the same may be true for other placental anomalies (e.g. confined placental mosaicism).

- Looking up, prior to grossing and/or signout, any clinical terms, unusual syndromes, or abbreviations used on the requisition form. This is particularly important in pediatrics, since many relatively rare syndromes are part of our daily routine.
- Reviewing and understanding, prior to grossing and/or signout, key points of the mother's clinical history that may be required for the appropriate interpretation of gross and/or microscopic findings. This may be done by utilizing any of the available electronic clinical information systems and/or by contacting the clinician(s) in charge of the patient's care.
- One particularly sensitive issue in pediatric pathology is the proper handling of fetuses. In Connecticut, examination of fetuses >20 weeks of gestation requires an autopsy request signed by a parent, and a death certificate. The autopsy examination is then performed in the Autopsy Suite by one of the residents on the Autopsy Pathology rotation. The residents rotating in the Placental Pathology service need to familiarize themselves with the proper handling of fetuses, and should contact the Pediatric Pathology attending whenever necessary.

Medical Knowledge

- Understanding the clinical significance of the diagnoses being made, including implications for the subsequent pregnancies
- Understanding the basic principles of congenital/developmental diseases (malformations, deformations, sequences, field defects, dysmorphic syndromes, pediatric cancer-predisposition syndromes and the like), inborn errors of metabolism, placental pathology, and disorders related to twining and multiple gestations.

Practice-Based Learning and Improvement:

- Using online literature and online searching resources (such as Online Mendelian Inheritance in Man-OMIM™) to identify recent advances in our understanding of the disease processes manifested in the cases

Interpersonal and Communication Skills:

- Always be aware of the increased sensitivity that parents may have in regards to gestational diseases. This sometimes introduces a high level of anxiety, and information needs to be delivered to clinicians promptly and efficiently. The residents should not get in touch with family members of pediatric patients without previous consultation with the faculty member in charge of the case.

Renal and Ultrastructural Pathology Rotation (AP-1) *(Updated 2011)*

Drs. Gilbert Moeckel and Michael Kashgarian

This integrated rotation incorporates the histopathology, ultrastructural, and immunofluorescence evaluation of a diverse spectrum of renal pathologic lesions, including kidney diseases in the pediatric and adult native kidneys, as well as in transplanted kidney grafts. The resident learns all of the techniques relevant to this subspecialty. In addition, all other diagnostic electron microscopy examinations on autopsy and surgical pathology specimens are reviewed by the resident during this rotation. This includes ultrastructural evaluation of tumors, peripheral nerve and muscle diseases, identification of virus, and evaluation of cilia. The goal of this rotation is to assure significant exposure to the plethora of renal diseases and understanding the role that ultrastructural studies play in diagnostic pathology.

Additional Goals and Objectives for the Renal/EM Rotation

Patient Care:

- Becoming proficient in the standard requirements and techniques for the submission of specimens for electron microscopy and immunofluorescence, paying particular attention to issues of diagnostic and prognostic significance
- Understanding the differences in transporting and processing of specimens for these special procedures
- Becoming proficient in immunofluorescence imaging interpretation
- Keeping cases moving along in the assessment and sign-out process: preview slides, IF, and EM, and bring cases to signout in a timely fashion

Medical Knowledge:

- Demonstrating knowledge regarding contribution and utility of electron microscopy and immunofluorescence microscopy to the surgical pathology diagnosis.
- Demonstrating knowledge of the indications for diagnostic electron microscopy and immunofluorescence microscopy
- Understanding the contribution of electron and immunofluorescence microscopy to resolving a differential diagnosis
- Demonstrate an understanding of cellular ultrastructure
- Demonstrate an understanding of normal histology of the kidney in biopsy specimens
- Demonstrate an understanding of the types of inflammatory changes involving glomeruli and interstitium
- Understanding the criteria for the diagnosis of acute and chronic rejection in renal transplantation
- Understanding the criteria for ultrastructural identification of viruses and other pathogens
- Understanding the contribution of ultrastructural features of tumors and other tissues to the diagnosis

Thoracic/Genitourinary/Misc Surgical Path Rotation (AP-1 and AP-2) *(Updated 2011)*

Drs. Ken Haines, Rob Homer, Adebowale Adeniran, Gouping Cai, Angilique Levi, and John Sinard

This rotation/service receives specimens from surgical specialties with insufficient volume to support an independent specialty service. The educational focus is on cardiothoracic (including pulmonary), genito-urinary and ophthalmic pathology.

The variety of specimens received on this service is more akin to programs with a general surgical pathology signout. Acquiring a broad range of grossing and diagnostic skills, and efficiently obtaining consultations from sub-specialist pathologists are important components of the rotation.

To assure exposure to all areas of these subspecialties, daily assignments and weekly assessments supplement the traditional case-based teaching approach.

Additional Resident Duties and Responsibilities

- Write up preliminary diagnoses and add appropriate ICD-9 and billing codes for each case previewed
- Attend weekly thoracic oncology tumor board, interstitial lung disease conference, and biweekly GU tumor board
- Attend and, if called upon, present an assigned paper at the monthly GU journal club

Additional Goals and Objectives for the "Thoracic/GU" Rotation

Patient Care:

- Become proficient in the standard techniques for the gross evaluation, dictation, and dissection of specimens from:
    - GU: Prostate, Bladder, Kidney, Ureter, Testis
    - Pulmonary: Approaches to biopsy and resections of neoplasms; inflammatory lung pathology
    - Bone and Soft Tissue: Benign versus Sarcoma
    - Eye and orbit: Cornea, Globe, Eyelid

  Emphasis is placed on issues of diagnostic and prognostic significance
- Understand commonly used techniques, including inflation/dissection, cytogenetics, electron microscopy

Medical Knowledge:

- The resident should demonstrate an appropriate level of understanding of the pathogenesis, clinical significance, treatment and prognostic factors of the major pathologic entities covered on the multi-specialty service
- Be able to generate an appropriate differential diagnosis for cases, and describe the diagnostic criteria used to resolve this differential
- Specific entities and topics:
    - First rotation:
        - Lung:
            - Normal anatomy/histology and processing
            - Acute lung injury / infections
            - Chronic diffuse lung disease
            - Lung cancer
        - Prostate:
            - Normal histology and hyperplastic changes
            - Inflammatory lesions and intraepithelial neoplasia
            - Carcinoma
        - Bladder:
            - Normal and flat lesions
            - Papillary and inverted neoplasms
            - Invasive urothelial carcinoma
            - Glandular lesions and cystitis
        - Kidney:
            - Benign neoplasms and tumor-like lesions
            - Malignant tumors
            - Pediatric tumors
    - Second rotation:
        - Testis
            - Infertility
            - Germ cell tumors
            - Sex cord / stromal tumors
        - Mediastinum, Cardiovascular, Ophthalmic
            - Thymoma
            - Cardiac valves
            - Aneurysms and arteritis
            - Ophthalmic pathology
        - Lung:

        - Pulmonary vasculitis
        - Metastatic tumors
        - Pseudoneoplastic and benign tumors
        - Mesothelioma
    - GU-Advanced
        - Uncommon / rare lesions
        - Mimic-ers

Practice-based Learning and Improvement:

- The resident should review new developments in the pathogenesis and diagnosis of entities seen on the service

Systems-based Practice:

- The resident should appropriately assign CPT codes for their cases

"Hot-Seat" General Surgical Pathology Rotation (AP-3) *(Updated 2011)*

The "Hot-Seat" rotation is one of the most challenging rotations in surgical pathology. The senior resident/fellow on this rotation previews the vast majority of the in-house cases that pass through surgical pathology before the slides go to the resident who grossed in the case. This affords the resident exposure to a vast array of surgical pathology, crossing all subspecialties.

One of the most challenging organizational issues associated with this rotation has been getting the Hot-seat resident appropriate feedback as to the diagnosis the attending pathologist ultimately made on cases for which the Hot-seat resident has rendered a provisional diagnosis. The Pathology Informatics Program has recently developed a new software solution to address this problem. Using this software, the Hot-seat resident can scan the barcode on any slide from a case and immediately retrieve all of the relevant information about the case, including the parts, status of slides, ordering clinician(s) with phone numbers, pathology staff, frozen section diagnosis, images of the requisition, gross photographs, and a list of prior material from the patient with full access to pdf versions of the prior reports. There is also a place for the resident to enter his/her diagnosis for the case. Later, the resident can go into review mode, which will retrieve all of the cases for which the resident entered a diagnosis which has subsequently been signed out, and allow the resident to compare his/her diagnosis with the final diagnosis for the case. The resident can also score their level of agreement with the final diagnosis as a self-performance metric, and the application will keep track of the percentage of cases in each agreement category.

In addition to rendering preliminary diagnoses, the Hot-Seat functions as a hub of communication between clinicians and residents/attendings. The Hot-Seat should be aware of the status of high priority cases, anticipate potential problems, and alert those involved to important issues. He/she must use his/her judgment to facilitate the movement of cases through signout and transcription.

Another important role of the Hot Seat resident is to facilitate the interactions between the Department and our clinical colleagues from other departments. The Hot-Seat resident is responsible for troubleshooting cases for clinicians, showing cases to clinical teams, and generally being a collegial liaison on behalf of the department. As such, the Hot-Seat resident is expected to be available at the Hot-Seat desk at all times. In the Hot-Seat, one is an ambassador for the Department; professionalism must be demonstrated at all times.

<u>Additional Resident Duties and Responsibilities</u>

- Review the slides for all in-house cases that come to the Hot-Seat, recording provisional diagnoses in the Hot-Seat application. If appropriate, order necessary special stains to facilitate the

handling of the case. Make notations for any stains you have ordered or any other information you become aware of through your contact with clinicians.

- Communicate any relevant information to the appropriate junior resident and/or signout team.
- **If you come across a case which you feel needs immediate clinical action, act.** DO NOT CALL PRELIMINARY DIAGNOSES TO CLINICIANS without first discussing the case with the attending, except in response to specific inquiries.
  - **When rendering a preliminary diagnosis, it is IMPERATIVE that the clinician understands that you are a resident and that the diagnosis is preliminary.** Feel free to communicate your level of confidence, but remember that your diagnosis is still preliminary.
  - Give the clinician some idea of when the signout attending pathologist will see the case and offer to call back with the final diagnosis. Use Post-it notes or some other system of organization to make sure you can do this.
  - Communicate to the signout team that the clinician/clinical team has inquired about the case, so the signout team may prioritize its review if indicated.
- Biopsies should be read and in the residents' boxes by 8 am. To facilitate this, you can work cooperatively in the morning with the residents on the biopsy-heavy subspecialty services, or begin earlier in the morning. (Biopsies are out the evening before at 10-11 PM; some Hot-Seat residents prefer to review the slides at night to avoid the morning rush.) Remember that the AP-1 and AP-2 residents are expected to have their biopsies ready for 9 AM signout.
- Late biopsies (those arriving after 8 AM) need to be reviewed and given to the appropriate resident ASAP.
- Flag important cases (unsuspected malignancy, cases requiring immediate treatment) to the resident's attention, so that he/she can alert the attending and prioritize signout.
- Try not to bypass the resident on service in your enthusiasm to discuss cases with the attending, unless it is urgent. However, if, in your professional judgment, immediate review by an attending is necessary, please respond accordingly.
- After the AP-1 and AP-2 residents have signed out their cases with their attendings, they should report the diagnoses back to you. While this is always desirable, the Hot-seat application will keep track of which cases you have evaluated and allow you to see the final diagnosis rendered once it has been entered into the computer. <u>All residents should report every final diagnosis back to you</u> after signout; they should also alert you to the status of pending cases so you can function effectively in your communications with clinicians.
- In those cases in which you find a significant disagreement between your preliminary interpretation and the case final diagnosis, you are encouraged to discuss your discrepancy with the signout attending. This should be done in a respectful, non-confrontational manner, keeping in mind that the purpose of such discussion is not only educational, but also a reflection of your involvement in patient care. Not infrequently, the Hot Seat resident picks up on something that the attending may have missed.
- CALL FINAL DIAGNOSIS on cases where the final diagnosis shows an unexpected malignancy or a significant change in diagnosis from that made at the time of frozen section, unless the junior resident, fellow, or signout attending has already done so.
- The Hot-Seat resident is expected to remain at their "post" until at least 5:00 PM on weekdays, even if all slides have been reviewed. Hot-Seat is responsible for the organization of the "unknown" resident microscopic conference.

<u>Additional Goals and Objectives for the Hot-Seat Rotation</u>

Patient Care:

- Increase your confidence and your ability to diagnose a wide variety of specimens

- Make critical decisions regarding the workup of cases, ordering appropriate stains and ancillary tests, which may he crucial for the final diagnosis.
- Report critical results to clinicians on a timely fashion, when appropriate.

Medical Knowledge:

- Understand the key therapeutic consequences of the pathologic diagnosis and facilitate communication of diagnoses which require rapid treatment action
- Become proficient in multiple areas of surgical pathology through the daily review of a large number of cases spanning many different subspecialties.

Interpersonal and Communication Skills:

- Learn to communicate effectively with clinical teams, providing preliminary diagnoses and following up on clinical issues
- Learn to communicate effectively with staff members of the Department of Pathology, making sure that cases are complete and ready for signout.
- Learn to communicate effectively with colleagues and faculty members in the Department of Pathology, providing accurate and appropriate clinical information to signout teams, and discussing case workups and final diagnoses.

Frozen Section Rotation (AP-3)

Surgical Pathology Staff

Senior residents in their third year of anatomic pathology training participate in intraoperative clinical care by serving as the front-line contact for frozen section consultations. During this rotation, all frozen section intraoperative consultations are the primary responsibility of the frozen section resident. These are evaluated under the direct supervision of an attending surgical pathologist, who is assigned to the service on a daily rotational basis. The frozen section resident is the default on-call resident for all weeknights Monday through Thursday, just as the frozen section attending each day is the on-call attending that evening.

It is crucial that the frozen section resident accurately communicate to the resident who will be grossing in the case how the specimen looked when it was received and what manipulations have been done to it. This is more difficult now that the frozen section area and gross room are physically removed from each other, but can be accomplished by writing notes and taking photographs. Photography of the specimen, especially after initial dissection, is important because the in-house built frozen section management application has the ability to share these photographs immediately with the operating room.

<u>Additional Resident Duties and Responsibilities</u>

- Keep your beeper on for 24-hour availability, from 7:30 AM Monday to 5 PM Friday.
- The frozen section coverage on the last day of the rotation is performed by the person finishing the frozen section month who is on call until 8:00 AM of the morning when the new frozen section resident starts.
- Obtain the OR schedule on the afternoon before a day of coverage, look up previous material, and request relevant slides for cases likely to generate frozen sections.
- Arrive no later than 7:30 AM (ORs start at 7:00 AM) to be available for specimens/questions from the OR. Inform the staff that you are present and where you can be found.
- When specimens arrive for frozen section (FS), label containers with case number, examine the tissue, perform touch preps if indicated, select tissue to freeze, and orient on chuck. Ask for assistance from the FS attending if you have any questions on how to process the specimen.

- Provide a written description of the specimen for the resident who will be responsible for the final prosection, including weight, size, orientation, sections taken, etc., attached to the protocol.
- Photograph interesting specimens before freezing, if sectioning will destroy the integrity of the specimen, and after sectioning, and ensure that the images are quickly loaded into the ImageDrop folder for filing and possible sharing with the operating room
- Help technicians freeze, cut, and stain when appropriate.
- Look at slides immediately when ready (verifying case and part numbers, size of tissue and number of pieces).
- Review slides with the FS attending, providing relevant history and previous material when available.
- Assure that all diagnoses are properly entered into the FSLink application and transmitted to the appropriate OR. Since the FSLink application is new, diagnoses must also be recorded on the paper frozen section form. If the operating room does not acknowledge receipt of the electronically transmitted diagnosis, call OR/surgeon with the diagnosis and acknowledge the diagnosis yourself in the FSLink application. Be sure to correctly indicate in the FSLink application the number of tissue blocks frozen for diagnosis and the number of unique touch prep sites used for diagnosis (this controls the billing for the specimens); consult with the signout to determine which of the frozen blocks should "count" for billing purposes.
- Photocopy diagnosis and separate the paperwork:
  - original to originals box behind FS desk
  - yellow and pink copies to residents' slide box
  - xerox with yellow protocol sheet, description, original containers, frozen controls and original specimen in formalin on resident's FS shelf
- Before putting a specimen in formalin, take fresh tissue as needed for special studies. Be sure to accurately document what you have done for the grossing resident. If frozens are busy and you are unable to take care of this within a reasonable amount of time, alert the ultimate grossing resident who may be able to help.
- Make sure that you have recorded enough information so that the ultimate grossing resident will understand how the specimens were handled at FS. For difficult cases, go over the specimen with the grossing resident at the time the frozen section is performed. Such communication is <u>expected</u> and <u>essential</u> for optimal patient care.
- If there is an AP-2 resident also rotating on the frozen section service, work with that resident to provide appropriate frozen section experience while retaining responsibility for smooth operation of the service. Although the AP-2 resident may cover the service alone during the AP-3's lunch or teaching/conference responsibility, the AP-3 resident should otherwise be present for all frozen sections. Difficult cases should be handled by the AP-3 resident.
- Supervise gross room technical staff to assure a clean, properly equipped working environment. This includes making sure that each cutting station is clean and appropriately stocked, that clean and sharp cutting instruments are readily available, that photographic stations are clean and stocked, and that all shelved supplies are stocked.
- Be responsible for any rushes (kidney, heart, biopsy, etc.) that come out after 5:00 PM.

<u>Additional Goals and Objectives for the Frozen Section Rotation</u>

Patient Care:

- Become proficient in quickly and accurately evaluating a specimen received for intraoperative consultation, selecting sections appropriate to answer the surgeons questions

Medical Knowledge:

- Understand the key decision points for surgery and how information obtained at frozen section can direct the source of the surgery

Interpersonal and Communication Skills:

- Learn how to communicate diagnoses clearly and succinctly to surgeons, providing the information they need without providing more information than is appropriate for the material examined
- Learn how to supervise junior residents in the gross room, providing them with needed assistance without simply assuming their duties

Bridgeport Hospital Pathology Service *(Updated 2011)*

Dr. Paul Cohen, Interim Chair of Pathology
Dr. Vinita Parkash, Director of Surgical Pathology
Dr. Young Choi, Director of Clinical Laboratories
Brian Jameson, Pathologist Assistant

The Pathology department at Bridgeport Hospital is staffed by the Department of Pathology at the Yale School of Medicine. Autopsies on Bridgeport Hospital patients are performed at Yale. Surgical pathology services are provided by on-site pathologists and one AP-3 level resident.

Bridgeport Hospital Rotation (AP-3)

Drs. Paul Cohen, Liming Hao, Vinita Parkash, and Marguerite Pinto

The rotation in Bridgeport Hospital Pathology Department allows an opportunity for AP-3 residents to begin to function as a practicing pathologist in a community hospital setting. This includes taking an active role in case management, technician and pathologist assistant supervision, and clinical consultation by preparing and presenting cases at multiple clinical conferences.

The AP-3 resident will cover the biopsy service 1-2 days each week. The final report bears the name of the resident as co-signout pathologist and it is expected that the resident will produce a report for which they are willing to take such a responsibility. Sign out requires that the resident review the case in its entirety, order the appropriate stains in the computer, and write up the final diagnosis. Ideally, they should edit and correct the diagnosis in the computer. This activity should resemble sign-out in real practice and the resident is expected to do everything short of signing out the case. In most cases, the AP-3 resident should take a complete transcribed and corrected case for sign-out to the attending pathologist. In occasional cases, where additional stains may be necessary, the AP-3 resident should still have the entire case submitted for transcription but should consider a quick discussion with the attending to determine if the additional work-up being considered by the AP-3 resident is in line with the norm at the institution. Cases that have been signed out with the AP-3 resident will undergo a rapid signout with the attending. At least one day a week the senior resident will be responsible for signing out Frozen Section cases. The proposed method of functioning in this setting is that the senior resident discuss with the PA what sections they want taken and cut. They will read the slide and form an independent diagnosis and ought to be ready and willing to call in the report within 15 minutes of receipt of the frozen. The attending pathologist will then review the material with them and may choose to allow the resident to call in the frozen or call in the frozen section themselves. The volume of frozen sections is sufficiently low to allow the resident to independently preview the frozen section and form an opinion. They will perform a similar function for on site FNA adequacy evaluations. 1-2 days a week, the resident will sign large cases and will have similar responsibilities.

Preparation and presentation of cases at conferences is also a high priority. This includes Tumor Board (every Friday), Pulmonary Conference (once a month), and GI Conference (every Tuesday).

Preparation for these conferences requires review of all slides and gross pictures if available, taking microscopic pictures using digital camera, literature review if dealing with an unusual entity, and creating a PowerPoint presentation. Emphasis should be on relevant clinicopathologic issues pertinent to patient management rather than pure histologic criteria, keeping in mind that the target audience consists of clinicians and residents from several specialties as well as nursing, medical, and PA students. The designated pathologist will provide back up and answer the more complex questions that may arise at the meeting.

The AP-3 resident will be required to choose one article of interest in a current pathology journal and present that article at a journal club.

The resident will be given an intake examination of up to 10 slides covering various areas of pathology to determine their level of knowledge and to identify any areas of weakness that we might help address during this rotation. A similar examination will be given at the end of the rotation, so that the resident may objectively evaluate their performance and identify areas that they need to focus on in subsequent rotations.

Additional Resident Duties and Responsibilities

- Residents will be expected to be in the department by 8AM, except when the resident is attending a grand-rounds speaker conference at YNHH. Some clinical conferences at Bridgeport Hospital occur at 7:00 AM, and residents are required to attend these conferences (for example, the biweekly GYN Tumor Board). On frozen section days, the resident is expected to be on site by 7:30 AM.
- Residents will perform all frozen sections on their assigned day, under supervision of a pathologist
- Residents may be required to assist in the cutting schedule in extremely rare circumstances. In the event this happened, the resident will complete these cases through to signout.
- Residents will attend all conferences at Bridgeport hospital which have pathology participation
- Residents will signout additional biopsies, cytology, and outreach cases as assigned to them

Additional Goals and Objectives for the Bridgeport AP-3 Rotation

Patient Care:

- Becoming proficient in the standard techniques for the gross evaluation, dictation, and dissection of a wide variety of specimens received in a large community Hospital, paying particular attention to issue of diagnostic and prognostic significance

Interpersonal and Communication Skills:

- Enhancing skills in writing concise, accurate reports in Anatomic Pathology
- Developing skills in communicating with community physicians while seeking additional clinical information, explaining the diagnosis, and answering other clinical questions that the physicians may have
- Enhancing and developing communication and presentation skills while preparing for tumor board and other multidisciplinary conferences

Professionalism:

- Learning to interact with a small, tightly knit group of PA/PA students, histotechnologists, technicians, pathologists, and other clinicians in a professional and collegial manner

Systems-based Practice:

- Understanding the differences between the practice models for anatomic pathology in academic and community hospital settings

Veteran's Administration Connecticut Medical Center

Dr. Gary Stack, Director of Pathology and Laboratory Medicine, VA Connecticut Healthcare System
Dr. Robert Homer, Director of Anatomic Pathology
Dr. Sheldon Campbell, Director of Laboratories

The Pathology department at the West Haven campus of the Veterans Administration Connecticut Healthcare System is staffed, in part, by members of Yale's Departments of Pathology and Laboratory Medicine. Residents rotate in both Anatomic and Clinical Pathology rotations at the VA.

Frozen section coverage is provided primarily by the signout Pathologist, thus allowing the residents flexibility in their time commitment. Autopsy coverage is provided by the residents on the autopsy service at YNHH. Off hours laboratory medicine issues are handled by the Yale CP resident on-call. Familiarity with the VA system is necessary from the beginning of the academic year for all residents and fellows taking call.

Veteran's Administration Connecticut Healthcare System (AP-1) *(Updated 2011)*

Drs. Robert Homer, Bart Kenney, Antonio Galvao Neto, Nelofar Shafi, and Susan Gobel

The rotation at the West Haven campus of the VA Connecticut Healthcare System allows the resident to function in an environment where the clinical material and the problems that challenge the pathologist are different from those encountered at YNHH. Specifically, the VA operates as a general pathology service rather than a subspecialty-based practice, although all VA attendings do have expertise and fellowship training in a specific subspecialty area.

The VA has its own hospital-wide computer system, and residents are expected to become familiar with its use. One major feature of the VA is the availability of a complete electronic medical record that allows comprehensive clinical and laboratory correlation with all diagnostic specimens. Additionally, the VA is a key training site for the Quinnipiac University Pathologist Assistant Program. As such, learning to work with and supervise PA's is an important feature of the rotation.

Additional Resident Duties and Responsibilities

- Residents will be expected to be on-site at the VA at least five hours each full day they are assigned to that rotation
- Residents will preview all slides on surgical and cytology cases and sign them out with a pathologist
- Residents will attend relevant tumor boards/conferences
- Residents will observe AP laboratory function and management

Additional Goals and Objectives for the VA AP-1 Rotation

Patient Care:

- Develop familiarity with the operation of a general pathology service and of AP laboratory function
- Develop an understanding of the approach to serving a veteran population with specific demographics and health concerns (lack of screening, late disease presentation, mental illness, smoking, substance abuse)

- Becoming proficient in supervising pathology assistant students in the standard techniques for the gross evaluation, dictation, and dissection of resection specimens, paying particular attention to issue of diagnostic and prognostic significance
- Looking up, prior to signout, relevant history on CPRS electronic medical record
- Taking responsibility in assisting with obtaining consultations from affiliated academic institutions

Interpersonal and Communication Skills:

- Attending GI, GU Hematopathology and General Tumor Boards and being able to discuss the key features of their cases

CLINICAL PATHOLOGY ROTATIONS

Blood Bank / Transfusion Medicine (CP-1 and CP-2)

Drs. Edward Snyder, Mark Shlomchik, Gary Stack, Diane Krause, Chris Tormey, and Yan Wu

Transfusion Medicine is comprised of the Blood and Tissue Bank, the Apheresis and Transfusion Service, and the Cellular Processing Laboratory. A full range of routine and special transfusion medicine services are provided. There are especially close interactions with the hematology/oncology program, the bone marrow and solid organ transplantation programs, the trauma and cardiac surgery service. An approved Transfusion Medicine Fellowship is funded for those wishing to pursue Transfusion Medicine as a career.

During the rotation the resident will learn the principles and skills involved in the workup of transfusion reactions, interpreting of antibody panel workup, the indications for and the performance of apheresis procedures, the indications for use of various blood products, and the interpretation of tests for transfusion transmitted diseases. The fundamentals of blood typing and screening, antibody identification, cross matching, etc., are learned through a comprehensive series of laboratory exercises designed to introduce the trainee to safe transfusion practice. Clinical rounds are held daily in the Blood Bank with the discussion of the use of uncrossmatched blood, massive transfusions, serology problems, transfusion reactions, special blood product management, positive transfusion transmitted disease testing, stem cell processing and infusion, and other relevant issues. Patient rounds are held daily in the Apheresis and Transfusion Service to discus all patients who receive apheresis treatments including peripheral blood stem cell collection and therapeutic apheresis, and patients who receive transfusion, phlebotomy, or medication infusion and have adverse reactions, deferral, and other issues.

Attending on-call coverage is available at all times; please refer to the on-call schedule. The Medical Director MUST be called when any of the following conditions are suspected or proven: acute intravascular hemolytic transfusion reaction, septic transfusion reaction, TRALI, new apheresis patient referral, incompatible blood is given to any patient, death as a result of transfusion, anaphylactic reaction to blood, seizures in a blood donor, inadequate blood inventory or Red Cross supply available as back-up, disagreement with members of the medical staff regarding blood ordering or transfusion reaction work-up, cardiac arrest in an apheresis patient, need to switch component blood type for a patient, patient has multiple antibodies and a limited number of RBCs are available, or simply if you think maybe you should.

Additional Resident Duties and Responsibilities

- Work up transfusion reactions
- Determine and approve indications for blood products
- Audit the use of uncrossmatched blood and massive transfusions
- Provide consultation and follow-up for the use of factor concentrates
- Interpret tests for positive antibody screen and identification, and positive DAT
- Learn blood typing and screening, antibody identification, and cross matching procedures through bench exercise
- Determine indications for the performance of apheresis procedures, the need for central line, consent patients, write orders for the procedures and related medications, write procedure notes, and coordinate activities for the procedure
- Determine deferral and manage adverse reactions for autologous blood collection, transfusion, phlebotomy, or medication infusion
- Interpret tests for transfusion transmitted diseases and provide consultation and notification
- Determine and approve indications for the work-up for platelet alloimmunization and management of matched platelets
- Provide consultation on calculation and dose for RhIg
- Other clinical consultations and follow-up as determined by clinical needs

Additional Goals and Objectives for the Blood Bank Rotation

Patient Care:

- Correctly classify transfusion reactions and give appropriate treatment recommendations.
- Choose appropriate cross-matching methods for various patients (e.g., electronic, immediate spin, and antiglobulin).
- Recognize and appropriately refer serological evaluations that are beyond the scope of a hospital-based transfusion service/blood bank.
- Correctly choose (or recommend) the appropriate blood product for patients with special needs.
- Triage and screen requests for blood components appropriately during inventory shortages.
- Demonstrate the ability to perform blood utilization reviews.
- Perform a donor interview and exam.
- Evaluate and perform initial management of whole blood and apheresis donor reactions.
- Write physician orders for peripheral blood hematopoietic stem cell collections and therapeutic apheresis procedures.
- Appropriately manage reactions that occur during peripheral blood hematopoietic stem cell collections or therapeutic apheresis procedures.

Medical Knowledge:

- Acquire a fund of knowledge necessary to function as an independent practitioner in the field of transfusion medicine. We follow the CP curriculum proposed by the ACLPS, for details, please see: Curriculum Content and Evaluation of Resident Competency in Clinical Pathology (Laboratory Medicine): A Proposal. *Clinical Chemistry* 52:6 (2006)
- Demonstrate understanding of and ability to interpret major regulations and guidelines that are applicable to collection, processing, storage, and release of blood and other cellular therapeutic products.

Practice-Based Learning and Improvement:

- Demonstrate the ability to develop new policies and procedures or change existing policies and procedures based on a review of the literature or issuance of new guidelines by regulatory agencies.

Interpersonal and Communication Skills:

- Demonstrate the ability to discuss the process of therapeutic apheresis and transfusion reactions with patients, and/or family members where appropriate; answer their questions; and obtain informed consent. Residents should show compassion and patience to patients and their families.
- Develop or improve communication skills in the course of carrying out their clinical responsibilities as first-line consultants for the transfusion service, by communicating with other physicians in multiple specialty areas, with technical staff members in the transfusion service, with apheresis nurses, and with other caregivers.
- Learn how to communicate efficiently, coherently, and understandably
- Learn how to organize and present complex information

Professionalism:

- Demonstrate compassion: be understanding and respectful of patients, their families, and the staff and physicians caring for them.
- Interact with others without discriminating on the basis of religious, ethnic, sexual, or educational differences.
- Demonstrate positive work habits, including punctuality, dependability, and professional appearance.
- Demonstrate a responsiveness to the needs of patients and society that supersedes self-interest.
- Demonstrate principles of confidentiality with all information transmitted both during and outside of a patient encounter.
- Demonstrate knowledge of regulatory issues pertaining to the use of human subjects in research.
- Demonstrate a commitment to excellence and ongoing professional development.
- Demonstrate interpersonal skills in functioning as a member of a multidisciplinary healthcare team

Systems-Based Practice:

- Gain an appreciation regarding the impact of transfusion medicine on the totality of health care; the role that transfusion services play in patient care in a wide range of medical specialties.
- Gain a perspective on how the local provision of transfusion services depends on regional and even national cooperative efforts to obtain and assure the availability of an adequate blood supply.

Clinical Chemistry and Toxicology Rotation (CP-1 and CP-2)

Drs. John McClaskey, Michael Hodsdon, Herbert Malkus, and Tore Eid

The Clinical Chemistry Laboratory performs over 150 different tests and provides a window on all aspects of clinical medicine. Rapid progress in areas such as automation, toxicology, endocrinology, therapeutic drug monitoring and "wellness testing" keeps the lab in a state of constant evolution with new or improved methods being introduced at a rate of one or more per month. Clinical Chemistry also provides oversight for all point-of-care testing in the hospital. The rotation is a busy one in which the resident takes first call for all consultations on the selection and interpretation of tests and for clinical problems arising in the laboratory. Daily rounds are held in which current cases presented by the resident form the basis for discussions of all aspects of Clinical Chemistry. These rounds are supplemented by frequent informal discussions with the Chemistry faculty as needed. Monthly Toxicology Rounds are conducted by Dr. Hodsdon. The Clinical Chemistry section also participates in the weekly endocrine rounds of the Department of Internal Medicine. During this rotation the resident will learn the basic principles of laboratory management, laboratory automation, quality control, serum protein and isoenzyme electrophoresis, clinical enzymology, laboratory endocrinology, pharmacokinetics and the clinical interpretation of therapeutic and toxic drug levels,

and clinical interpretation of markers of cardiac injury, as well as personnel and data management in a large laboratory. Research opportunities include assay development and pharmacokinetic studies of the latest drugs for HIV infection, the neurobiology of cocaine use, and clinical outcome studies of testing algorithms, including point-of-care testing and strategies for cardiac risk assessment.

Additional Resident Duties and Responsibilities

- Learn principles of automation
- Interpret and consult on cases for toxicology, endocrinology, and therapeutic drug monitoring
- Interpret protein and isoenzyme electrophoresis

Additional Goals and Objectives for the Clinical Chemistry Rotation

Patient Care:

- Become proficient in presenting cases at laboratory rounds and correlation conferences
- Appropriately interpret serum protein electrophoresis panels
- Appropriately interpret overdose panels and therapeutic drug monitoring

Flow Cytometry and Immunology (CP-1 and CP-2) *(Updated 2011)*

Drs. Brian Smith, Henry Rinder, Greg Howe, Chris Tormey, Tore Eid, Michael Hodsdon, Stephanie Eisenbarth, David Hudnall, and Richard Torres

The CP-1 and CP-2 resident rotations in Flow Cytometry are separate rotations, each combined with the Hematology and Immunology rotations, respectively. This provides an integrated case-oriented approach to education. For example, flow cytometry studies are examined in the context of hematopathology morphology and cytogenetic and molecular diagnostic assessment and rheumatologic work-ups are interpreted with knowledge of immunologic and complementary chemical analysis results. The focus is derived from the typical patterns of association between disease driven patient testing and helps maintain improved continuity of care when interacting with clinical teams, particularly hematologists, clinical immunologists, and other specialties.

For similar reasons, virology serologic assays are carried out in the virology laboratory and these and bacterial serologic assays are mainly the purview of the Microbiology/Virology resident for use in consultative evaluation of patients performed in conjunction with the microbiology fellow and infectious disease clinical team. Some immunology rotation interpretative work (such as IFEs) is more associated with hematologic workups, but it reduces the hematology/flow cytometry resident workload and fits better with other associated rotation duties (such as SPEP). In each of the sections, emphasis is placed on the acquisition of integrated consultative skills related to the specific discipline.

All rotations are characterized by close interaction with other hospital clinical teams and participation of the resident in joint Pathology-Medicine-Pediatric-Surgery conferences and rounds. Specifically, in Flow Cytometry/Hematology, the resident works with the resident rotating on surgical hematopathology and with the Hematopathology fellow, preparing cases for weekly joint Hematopathology Conference with Medicine and Pediatric attendings and housestaff, and at weekly joint Lymphoma/Stem Cell Transplant Conference. The more senior residents on Flow Cytometry or Immunology may also participate in monthly Hematopathology/Molecular administrative rounds for a managerial perspective on the planning of development work. In Immunology, the resident is responsible for collecting data and preparing interpretive assessments together with the immunology attending for the monthly Laboratory-Clinical Immunology Conference at which lab medicine

presents together with adult and pediatric Immunology/Allergy and Rheumatology attendings and house staff, providing an excellent forum both for ongoing clinical diagnostic/therapeutic care and for education. These joint conferences also provide quality assurance functions for all clinical services involved.

Responsibilities are graded, increasing as the resident acquires experience. In Flow Cytometry, residents are responsible for initial formal interpretation of all immunophenotyping and DNA ploidy reports, including collecting clinical history data from online chart notes and evaluating cytometry data in the context of all other relevant morphologic and molecular studies. Learning to appropriately apply ICD-9 coding is also a resident responsibility as it is within the scope of pathologist responsibilities. All immunophenotyping (blood, marrow, lymph node, fluids) is handled in the same laboratory. The total number of flow cytometry studies is more than 7500 per year and growing, including leukemia/lymphoma evaluations, studies for myelodysplasia, transplant/stem cell assessments, and immunodeficiency (including both HIV and congenital immunodeficiencies) evaluations. At the start of the day, the resident, attending or fellow, and technologists review the day's upcoming work by looking over the morphology and clinical data for each case and jointly choosing an appropriate 'panel' of tests. Residents later review each flow result independently and record their preliminary interpretation; at afternoon signout rounds, this is then reviewed with the attending and a final interpretive report generated. The result is frequently called to the ordering clinician by the resident, under supervision of the attending. Communication skills are regarded as one of the core components of clinical pathology training and such interactions are taught, monitored, and formally evaluated.

Graduated responsibility occurs both throughout the rotation and between the CP-1 and CP-2 rotations. First year residents initially may handle only a subset of the total daily workload in terms of detailed evaluation and gradually move to handling the entire repertoire; consultation with Medicine/Pediatric/Surgical attendings (by phone or in person) is initially carried out in the presence of the pathology attending, but over time, residents take sole responsibility for this. While the goal is for residents to enter their own preliminary flow interpretations into the computerized system, part of the process of acquiring experience with this involves transcribing attending written flow diagnoses into the computerized report. Residents attend joint conferences initially and gradually take responsibility for presentation at those conferences. CP-1 residents learn technical aspects of flow cytometry and gradually acquire skills to manage gating adjustments on the flow cytometry raw data files during evaluation for which a specific computer has been designated. The Hematopathology fellow, when on a Flow rotation, takes a senior educational role, substituting for the attending in the education of the resident as appropriate and responsible for education of medicine and pediatric housestaff rotating through the service. He/she assumes managerial responsibility, generally not assumed by CP-1 residents.

Consultative interpretive studies in Immunology include: immunofixation electrophoresis, CSF oligoclonal banding, and interpretive analysis for all molecular studies. The latter include many different types of assays for among others: diagnosis of inherited hypercoagulability, gene rearrangements for NHL, diagnosis and treatment of myeloproliferative disorders, quantitative transcript assays (e.g. EBV, *BCR-ABL1*) for therapeutic response, UGT polymorphisms for predicting complications, and screening for cystic fibrosis risk. Some of these studies are done in support of the approximately 350 stem cell transplants and >500 solid organ transplants performed at YNHH per year. There are also >2,000 ANA, >2,600 quantitative Ig, >10,000 syphilis serologies, and >1,000 mycoplasma/toxoplasma serologies per annum. Graduated responsibility is similar to that outlined above: CP-1 residents take all initial consultative calls to the laboratory but do not carry out managerial responsibility; CP-2 residents assume a junior managerial role, consult and approve

serologic studies, and take primary responsibility for education of allergy/immunology housestaff rotating through as well as serving as primary liaison for guiding and interpreting immune deficiency patient workups with allergy/immunologists, immunology lab attendings, and the resident on flow cytometry. Such cases serve as basis for the monthly combined rheumatology/immunology/lab medicine conferences which residents help prepare. CAP challenges that require pathologist interpretation are also reviewed initially by residents in the respective rotation and then reviewed with the corresponding attending prior to submission. In addition, QC/QI duties (as an elective) are gradually assumed based on what other rotations the resident may have had previously.

Additional Resident Duties and Responsibilities on the Flow Cytometry Rotation

- Collect clinically relevant history for flow cytometry cases from electronic record and flow cytometry charts
- Consult and interpret flow cytometry immunophenotyping, PNH, and DNA ploidy studies

Additional Resident Duties and Responsibilities on the Immunology Rotation

- Interpret immunofixation electrophoresis and isoelectric oligoclonal banding
- Consult and approve serologic studies
- Communicate important results relevant to hematologic workups to the Flow Cytometry/Hematology resident

Additional Goals and Objectives for the Flow Cytology / Immunology Rotation

Patient Care:

- Become proficient in presenting cases at laboratory rounds and correlation conferences
- Appropriately interpret immunofixation electrophoresis and oligoclonal bands
- Appropriately interpret flow cytometry results
- • Learn to compose clear, accurate, complete, and concise diagnostic reports for flow cytometry, oligoclonal bands, immunofixation electrophoresis, and molecular diagnostics
- • Become adept at verbally communicating flow cytometry results

Hematology Rotation (CP-1 and CP-2)

Drs. Henry Rinder, Brian Smith, Chris Tormey, David Hudnall, and Richard Torres

The complexities of identifying blood-borne parasitic infections, deciphering abnormal hemostasis, diagnosing a hematologic malignancy or identifying hemoglobinopathies demand a particularly close collaboration between the laboratory medicine and the clinical care physicians. Our goal is to bring the latest developments in cellular, protein, and molecular biotechnology directly from the research bench to the clinical hematology laboratory for patient care.

During the rotation in hematology, the resident has the opportunity to learn general hematology as well as various specialty areas including coagulation, urinalysis, bone marrow interpretation, and flow cytometry. The resident is responsible for the daily review of abnormal differential counts, blood or body fluid smears containing atypical cells, platelet function testing, hemoglobin electrophoreses, and special hematology cytochemistries. The resident also reviews flow cytometry and special coagulation studies and prepares all reports on these studies in consultation with the attending staff. Drs. Smith and Rinder have joint appointments in Internal Medicine (and, in the case of Dr. Smith, Pediatrics) and rounding with the clinical hematology team is available to interested residents.

As noted in the section on Flow cytometry and Immunology resident responsibilities, residents in Hematology enjoy graduated duties as they progress in their training. For example, CP-1 residents focus on learning diagnostic criteria, honing their skills in microscopy, and becoming familiar in general with the technical aspects of the hematology laboratory. Over time, residents begin to field questions independently and direct the activities of the technical staff. Finally, CP-2 residents take on the role of an assistant director of the laboratory, handling complex technical and clinical issues, overseeing QC/QA and regulatory components, and handling all clinical interpretive work. Upon completion of the hematology laboratory rotations, the senior resident will be competent to independently interpret hematology assays and supervise a professional staff.

Additional Resident Duties and Responsibilities

- Smear (and fluid cytopathology) interpretation and correlation with cytology
- Interpretation of special coagulation and hemostasis work-ups for clinical consults
- Blood cytochemistry interpretation to correlate with flow cytometry
- Oversight and interpretation of non-routine special hematology testing

Additional Goals and Objectives for the Hematology Rotation

Patient Care:

- Become proficient in presenting cases at hematology conference
- Become proficient in the interpretation of smears, marrow aspirates, coagulation profiles, CBC cytograms, and hemoglobin screens
- Learn how to perform manual differentials
- Appropriate referral for reference testing, e.g. hemoglobin gene analyses

Microbiology Rotation (CP-1 and CP-2)

Drs. David Peaper, Sheldon Campbell, and Thomas Murray

During the rotation, the resident will learn general microbiology techniques as well as the interpretation of cultures from blood, CSF, the respiratory tract, genital areas, wounds and stools. Skill will also be obtained in mycobacteriology, mycology, parasitology, molecular diagnostic methods, and the interpretation of antibiotic sensitivity profiles. These skills are learned by rotations through the various stations of the laboratory as well as daily rounds in which instructive cases are discussed from both the microbiological and clinical points of view.

Cancer chemotherapy, organ transplantation, and HIV infections have let to an increasing number of patients with immunodeficiency who in turn are susceptible to a large number of opportunistic pathogens causing disease. The development of sensitive and specific diagnostic procedures for these opportunistic pathogens presents an ongoing challenge. Novel, emerging infections and changes in the pathogenic mechanisms and antimicrobial resistance of familiar pathogens also provide new problems. In addition, the application of monoclonal antibodies and molecular techniques is revolutionizing all of microbiology.

In order to provide clinical correlation, Infectious Disease teams from adult and pediatric services round in the laboratory daily and review laboratory tests relevant to their patients. Residents help to collect, demonstrate and explain the laboratory tests to the I.D. team, as requested on specific patients. The resident also attends the weekly clinical conference of the Infectious Disease Service. An approved Clinical Microbiology Fellowship is funded for those wishing to pursue Microbiology as a career.

Additional Resident Duties and Responsibilities

- Learn general microbiology techniques
- Interpret routine and special cultures
- Consult on biochemical identification and antibiotic sensitivity profiles
- Prepare and present at plate rounds with the Infectious Disease Service
- Correlate microbiologic results with clinical and pathologic findings

Additional Goals and Objectives for the Microbiology Rotation

Patient Care:

- Assess the quality of a specimen by Gram stain
- Utilize antibiotic susceptibility data to determine the appropriateness of an antibiotic choice
- Learn to present cases to the Infectious Disease clinicians on rounds
- Appropriately report AFB smears to clinical team(s)
- Correlate relevant histopathology with the microbiology results

Virology Rotation (CP-1 and CP-2) *(Updated 2011)*

Drs. Marie Landry and David Peaper

The Clinical Virology Laboratory is a full-service virology laboratory operating 7 days a week that performs rapid detection of viral antigens in clinical samples, a large menu of molecular tests, conventional and rapid virus isolation techniques, and determination of viral antibody response.

Direct detection of viral antigens by cytospin-enhanced direct immunofluorescence (DFA) is employed for VZV and HSV in skin lesions; HSV, VZV and adenovirus in eye swabs; and RSV, influenza A and B, parainfluenza types 1-3, adenovirus and HMPV in respiratory samples. Hepatitis B surface antigen is detected in serum and rotavirus in stool by ELISA. Molecular methods include commercial Roche assays to detect and quantify HIV-1 RNA, HCV RNA and HBV DNA in plasma or serum, and to detect HIV-1 provirus in peripheral blood mononuclear cells. Real-time TaqMan PCR assays, developed in-house, are used to detect DNA viruses (HSV, VZV, CMV, EBV, HHV-6, JC virus, BK virus, adenovirus, parvovirus B19) and RNA viruses (enteroviruses, human metapneumovirus, RSV, influenza A and B, influenza A subtypes, parainfluenza types 1-3, rhinovirus and norovirus. HCV genotyping (Line prove assay)and HIV-1 drug resistance genotyping (sequencing) are also available. A variety of cell cultures are maintained for isolation of common viruses. Rapid shell vial centrifugation cultures are routinely performed for CMV. Antibody tests are available for hepatitis A, B, C, HIV, HSV 1 and 2, CMV, VZV, EBV, rubella, measles, and mumps by random access chemiluminescence; and for parvovirus B19 and West Nile virus by ELISA; and for EBV by IF. Immunoblots are performed for HIV-1 and HCV. The detection of *Clostridium difficile* by GDH bacterial antigen followed by cytotoxin neutralization in cell culture is performed in the Virology Laboratory.

A teaching schedule has been organized so that residents will become familiar with all testing done within Virology. The resident is expected to investigate problems, determine clinical correlations when needed, consult with physicians, interpret HIV western blots, and correlate virology results with pathologic findings. A close working relationship between the virology laboratory and the transplant and AIDS care programs is essential and the resident helps to communicate and maintain this relationship.

Additional Resident Duties and Responsibilities

- Consult with physicians on molecular tests
- Correlate virology results, especially molecular tests, with clinical and pathologic findings
- Contact the Infectious Disease team and prepare case histories for the biweekly virology case presentations associated with Infectious Disease rounds

Additional Goals and Objectives for the Virology Rotation

Patient Care:

- Become proficient in handling telephone consultations
- Interpret HIV-1 western blots and other molecular diagnostic tests
- Learn to present cases at laboratory rounds

Veteran's Administration Healthcare VA-1 and VA-2 (CP-1)

Drs. Gary Stack, Sheldon Campbell, Nelofar Shafi, Chris Tormey, Donald Mayo, Rick Torres, David Peaper, and Brigitte Griffith

The VA-1 rotation provides the resident with the opportunity to practice Clinical Pathology in the setting of an integrated Pathology and Laboratory Medicine Service. Residents cover all sections of the clinical laboratories and have the option to interact more closely with the Anatomic Pathology laboratories. This allows the resident to gain a broader view of patient diagnostic services than is possible in the more specialized rotations.

Of particular interest are two national reference laboratories for virology and mycobacteriology. These laboratories serve the entire Veterans Administration health care system, as well as many non-government medical facilities. The VA also has a recently established molecular diagnostics laboratory with state-of-the-art equipment, which provides opportunities for residents to participate in new test development.

During this rotation, the resident also has the opportunity to observe and perform bone marrow aspirations and biopsies, and to interpret those tissues for final diagnosis, providing a 360-degree experience in aspirate procedures.

The VA-2 rotation provides residents with a formal graduated responsibility with senior level duties. The resident may elect to act as the assistant director of a subspecialty laboratory, handling all procedural and personnel issues, CAP surveys, budget and capital issues, and of course, all interpretative aspects of that laboratory. In addition, the VA-2 rotation offers specialized experience at the central virology laboratory, the state epidemiologic center, and other VA sites of excellence.

Additional Resident Duties and Responsibilities on the VA-1 Rotation

- Learn the practice of general Clinical Pathology integrating lab diagnostics with medicine and surgery ward teams
- Consult, investigate, and approve all send-out tests for non-routine laboratory studies
- Observe and perform bone marrow aspirations and biopsies

Additional Goals and Objectives for the VA-1 Rotation

Patient Care:

- Understand appropriate use of blood products and esoteric testing

- Learn to interpret molecular diagnostic tests, Lyme disease results, and antibody screens
- Evaluate transfusion reactions
- Learn to assess and discuss test methodology and evaluate application of new technology
- Utilize and critically evaluate medical literature

Additional Resident Duties and Responsibilities on the VA-2 Rotation

- Formal graduated responsibility with senior level duties supervising junior residents
- Act as the assistant director of a subspecialty laboratory
- Investigate lab-specific procedural and personnel issues
- Interpret and assist in signing out of CAP proficiency testing
- Address budget and capital issues
- Obtain specialized experience at the state epidemiologic center and other VA sites of excellence
- Participate in test development at two national reference laboratories for virology and mycobacteriology

Additional Goals and Objectives for the VA-2 Rotation

Patient Care:

- Become proficient in reference lab consultations
- Perform mock-CAP inspection of subspecialty labs and make recommendations
- Become proficient in mycobacterial and viral diagnoses

Laboratory Management (CP-2)

Dr. Henry Rinder

Senior (CP-2) residents have a mandatory 4 week rotation during their YNHH clinical pathology time in Laboratory Management. Residents may choose several options for accomplishing the goals of this rotation that are namely: to experience and participate in the daily management of a clinical laboratory. Residents may rotate among different labs or elect to work within a single laboratory for the entire rotation block. Residents work directly with a medical director to gain experience in the following areas of lab management:

1. Regulatory administration
2. Financial management and planning
3. Instrument evaluation and comparisons
4. Personnel issues and direction
5. Handling complex technical and clinical problems beyond the level of a CP-1
6. Follow-through on CAP PT, other proficiency training, computer and LIS problems, and assisting with inspections

Residents are asked to initially shadow a director to observe management issues and the style of the director in handling problems. Residents are then encouraged to directly undertake solving management problems and work on some of the above issues, with immediate attending supervision available. This enables residents to develop their own personal way of addressing management problems and gain skills at management while having attending support for any and all management issues. Residents who elect to work within a single lab for the rotation are asked to also select a limited scope single management project for that period.

Examples of prior lab management projects:

1. Mock CAP inspections to prepare for formal inspection
2. Evaluation of new automated or kit assays versus in-use manual methods
3. Development of algorithms for test ordering and/or utilization
4. Financial assessment for needed FTE's in order to run new instrumentation

Additional Resident Duties and Responsibilities

• Develop a plan for the rotation in consultation with the rotation director
• Set specific goals and objectives for a personally tailored management experience

Additional Goals and Objectives for the Laboratory Management Rotation

Systems-Based Practice:

- Begin to acquire the skills necessary to manage a clinical pathology laboratory
- Understand external regulatory issues which pertain to the operation and certification of a clinical laboratory

Molecular Cytogenetics Laboratory (Genetics) (CP-2)

Dr. Peining Li

Cytogenetics is now an integral diagnostic and prognostic tool in various branches of medicine (e.g. oncology, pediatrics, cardiology, neurology, and internal medicine). The number of syndromes identified as associated with chromosome abnormalities has increased from less than a dozen in the 1960s to over 400 today. More recently, cancer cytogenetics has provided valuable diagnostic and prognostic information for hematopoietic tumors and tumors of solid tissues. The cytogenetics laboratory at the Yale University School of Medicine has been updated and staffed and now offers a full range of services for clinicians and researchers from Yale and beyond.

The cytogenetics laboratory services include routine and specialized chromosome karyotype analysis, fluorescence in situ hybridization (FISH) and genome-wide array comparative genomic hybridization (aCGH), and collaborative research services. Types of specimens processed include blood, amniotic fluids, chorionic villus, products of conception, bone marrow, skin, solid tumors, and many others.

Additional Resident Duties and Responsibilities

• Become familiar with analytical cytogenetic techniques, nomenclature, and counseling
• Gain experience in human chromosome G-band techniques and chromosome identification
• Learn FISH and aCGH techniques
• Interpret and report numerical and structural chromosome abnormalities

Additional Goals and Objectives for the Molecular Cytogenetics Rotation

Patient Care:

- Perform karyotyping and FISH imaging for selected abnormal cases.
- Interpret test results from karyotyping, FISH and aCGH analyses
- Become proficient in presenting cases at laboratory rounds and correlation conferences

Molecular Diagnostics Laboratory (Laboratory Medicine) (CP-2)

Dr. Greg Howe

Molecular techniques are changing the face of medicine. Few areas are being more intensely affected than Laboratory Medicine, which has the duty of translating assays developed in the research laboratory into routine, rapid and cost-efficient clinical laboratory assays. Believing that techniques based on recognition of nucleic acid sequences will become widely applicable, we have established a Molecular Diagnostics Laboratory that has the job of developing molecular assays, transferring them to routine clinical use and overseeing their continued use. We are currently developing a wide range of molecular diagnostic assays that will affect all aspects of Laboratory Medicine and are at the forefront of the molecular diagnostics field. A large number of tests, including those for genetic disorders such as hemochromatosis, prothrombin G20210A mutation, Factor V Leiden and cystic fibrosis screening, as well as those for tumor diagnosis and minimal residual disease detection, are carried out. Techniques include several amplification strategies, sequencing, quantitative PCR, and RFLP analysis. Bacterial and mycobacterial identification by 16S ribosomal amplification and sequencing are also performed. Residents are regularly exposed to molecular techniques in the majority of their rotations. For example, the Virology and Microbiology laboratories test for a number of organisms by molecular diagnostics methods, such as HIV, HSV, enterovirus, chlamydia, and mycobacterium. In addition, the pathology department at the affiliated VA performs molecular diagnostics testing for HCV and Factor V Leiden. Residents also have the opportunity to work on new assays in the Molecular Diagnostics Laboratory, either as a rotation project or as a development project in their rotation. Finally, a lecture series in molecular diagnostics is taught jointly by Anatomic and Clinical Pathology.

Additional Resident Duties and Responsibilities

- Interpret all assays for identifying genetic disorders such as hemochromatosis and cystic fibrosis
- Hypercoagulation consults with prothrombin G20210A and Factor V Leiden mutation analysis
- Learn and apply methodologies for tumor diagnosis and minimal residual disease detection
- Participate in laboratory procedures of amplification strategies, sequencing, quantitative PCR, and RFLP analysis

Additional Goals and Objectives for the Molecular Diagnostics Rotation

Patient Care:

- Become proficient interpreting hematopathology tests, EBV tests, and pharmacogenomics tests

PATHOLOGY INFORMATICS *(Updated 2011)*

Informatics is defined as the science of information management. As the amount of medical information that needs to be accessible and assimilated has grown, manual management of this information has become impossible. Therefore, familiarity and proficiency with computers has become an essential component of informatics. The pathologist of the future (and of today), in order to effectively serve his/her role as a diagnostic consultant, must become comfortable with the use of computers to access and manage information. Therefore, training in informatics is an essential part of any modern pathology residency training program. However, unlike many of the subspecialty areas of pathology that have segregated from the mainstream, ALL pathologists must be able to use computers. Therefore, informatics exposure and training at Yale is fully integrated into each and every rotation.

All day-to-day operations in both anatomic and clinical pathology are managed by laboratory information systems (LIS). Each department maintains its own LIS. The anatomic pathology services

use CoPath Plus from Cerner/DHT. Yale Pathology is unique among all CoPath users. Extensive in-house expertise and special arrangements with the vendor allow us to customize our system to meet departmental needs. This is managed by the Pathology Informatics Program's Operations Unit. The clinical pathology laboratories have recently installed a new LIS from SCC Soft Computer, which is maintained by Laboratory Medicine's Instrumentation and Data Processing Unit. Each resident interacts with these systems on a daily basis, managing their cases, entering histology information, ordering tests, looking up test results, and printing reports. The systems can also be searched to identify cases for teaching or research purposes (with appropriate approvals). Virtual Private Networking software and accounts allows the residents to access the laboratory information systems from off-site locations, such as home, when on call.

Residents also have electronic access to other hospital information systems, including the radiology PAC system (which allows residents to view not only the reports but the actual images for all plain films, CT, and MRI studies) and the inpatient and outpatient electronic medical record systems. The institution is currently undergoing a massive reorganization of its information technology unit. The three hospital members of the Yale-New Haven Health System (Yale-New Haven Hospital, Bridgeport Hospital, and Greenwich Hospital), together with the Yale University School of Medicine, are uniting their IT support structure and collectively implementing a new Health System-wide medical record (EPIC) over the next two years, which will allow better and more complete access to patient information.

Residents are also exposed to many other informatics tools. All residents are given electronic mail accounts. All resident computers, as well as most workstations throughout both departments, give the residents access to the internet and the world wide web for literature searches and access to other information resources and on-line databases. Departmental conferences and vacation schedules are maintained by the residents in on-line calendars. All residents learn to acquire and use both gross and microscopic digital images. Digital cameras, both copy stand-mounted and microscope-mounted, are available to all residents 24 hours a day. Residents use digital images and presentation software (PowerPoint) in preparing formal conferences which are delivered in conference rooms equipped with digital projection equipment, available in both departments. They also use image editing, word processing, and spreadsheet software.

Finally, residents receive a formal education in informatics through a series of didactic lectures, delivered by faculty in both departments with a special interest in informatics. Topics include desktop computer hardware and software, networking and the internet, databases, interfaces, laboratory information systems, and diagnosis coding.

Opportunities are available for the residents to get involved in system customizations, interface design and deployment, and web page development. Elective time may be spent working on special informatics projects, under the instruction and supervision of faculty.

Additional Goals and Objectives for Informatics Training

Patient Care:

- Demonstrating proficiency in the use of the departments' clinical information systems and understanding their role in the delivery of patient care
- Demonstrating an ability to access hospital patient information systems to obtain clinical information on patients who have material being evaluated in pathology or laboratory medicine

Medical Knowledge:

- Understanding basic computer hardware components

- Understanding software architecture, including operating systems, object code, and the differences between high-level and low-level programming languages
- Understanding basic networking logic and the functioning of the internet
- Understanding basic database theory, the advantages of relational databases, and the utility of database management systems
- Demonstrating proficiency in acquisition of digital images
- Demonstrating basic understanding of image editing techniques
- Demonstrating proficiency in the use of word processing, spreadsheet, and presentation software

Practice-based Learning and Improvement:

- Using on-line literature searching resources to identify recent advances in our understanding of disease processes

Interpersonal and Communication Skills:

- Being able to communicate to Information Technology staff when a desktop machine or the central information system is not functioning properly

Professionalism:

- Understanding that information systems are a tool to assist in the provision of medical care, are imperfect, and are limited in their abilities by the lowest common denominator between the builders and the user
- Demonstrating an understanding of the importance of preserving patient privacy and confidentiality in the performance of their duties

Systems-based Practice:

- Promoting the practice of evidence based health care delivery, drawing upon literature and other investigative work
- Demonstrating an appreciation of the importance of accurate data entry into the department's Clinical Information System (eg Part Type) which will allow appropriate retrieval of cases for approved research or educational purposes

LABORATORY MANAGEMENT *(New 2011)*

Laboratory management is one of the most important things that pathologists are called upon to do in their careers. Quality patient care requires accurate lab results, and assuring that accuracy is not a trivial process. To be prepared to effectively manage a clinical laboratory, residents must become familiar with a number of areas not traditionally considered "medical", such as quality control and quality assurance, equipment maintenance, external regulations, human resources, policy development and management, and reagent supply control.

The role of the pathologist in laboratory management is more "transparent" during the clinical pathology training, and thus the focus of training in lab management is during the CP blocks. However, there is a growing national trend toward a more formalized approach to management in the AP labs, and structured workflow analysis techniques well established in CP are being adopted in anatomic pathology, including breaking down laboratory processes into pre-analytic, analytic, and post-analytic phases.

Resident training and exposure to laboratory management at Yale occurs in many ways. There are several lectures given each year focusing on issues related to lab management and quality assurance, (e.g. overview, financial management, personnel management, billing and external regulations), comprising a core curriculum. More importantly, however, the residents are integrated into the

weekly management meetings that occur in each lab, as well as participate in daily management decision. This occurs in a graded fashion, with CP-2 residents playing a greater role than CP-1 residents. Residents participate in annual internal mock inspections of the various labs, and some even join faculty in the department inspecting external laboratories as part of the College of American Pathologists Laboratory Accreditation Program. During the VA rotation in CP, residents delve deeply into the details of laboratory test workflow and test validation for a particular test, reporting their findings at the "test-of-the-week" conference. Residents are encouraged to participate in the actual process of bringing a new test on-line and making it available to the medical staff.

Finally, a new rotation in Laboratory Management has been created for CP-2 residents to provide a focused and dedicated practical exposure to laboratory management issues. This rotation is described in greater detail elsewhere in this manual.

MOLECULAR DIAGNOSTICS AND GENOMICS *(New 2011)*

As our understanding of the links between genetic alterations and disease increases, the use of a wide range of techniques to look for genetic alterations in patient material is expanding. Nowhere is this happening faster than in the evaluation of neoplastic disease. These genetic alterations can be used to help classify a tumor into a particular diagnostic category (molecular diagnostics), to predict the behavior of a tumor (molecular prognostics), or to suggest potential treatment options (tumor profiling).

The modern practice of Pathology requires pathologists to understand the relationship between genetic changes and disease, to know when molecular testing techniques are warranted, and to understand how to interpret the test results in the context of the specimen and patient. With the proliferation of new companies aggressively marketing new molecular tests to surgeons and other physicians, as well as patients themselves, the pathologist is often called upon to be the voice of reason, applying sound scientific principles and our understanding of quality assurance issues in assessing the appropriateness of a particular test or the value of the result of that test.

While "Molecular Pathology" exists as a subspecialty in pathology, all pathologists of all subspecialties must develop a level of proficiency in the use of molecular testing, as has already become the case with immunohistochemistry and information management tools. In the Yale Pathology Residency Program, residents are exposed to a wide range of molecular techniques through a multi-facetted approach. First and perhaps most important is the use of molecular studies in the daily evaluation of cases. However, in addition to this, more formal approaches to training in molecular pathology have been established.

Didactic Lectures in Molecular Pathology and Genomics

This series of lectures in morning conference slots provide a broad exposure to the fundamentals of genomic testing, including the architecture of the genome, functional genomics, epigenetics, methods of genomic analysis, and genomic alterations in disease.

Introductory Rotation in Molecular Pathology

This one-week rotation gives PGY-1 residents in AP an early "hands-on" exposure to practical aspects of the performance of molecular testing in the Molecular Diagnostics Lab in Pathology and the Tumor Profiling Lab in the Smilow Cancer Center.

Molecular Pathology Journal Club

Through the presentation and discussion of recent papers using molecular techniques, residents (working with the Molecular Genetics Fellow) see and critically evaluate the use and application of molecular pathology in the evaluation of patient material. Each paper presented in the Journal Club focuses on particular techniques and how the results of those tests can be used in clinical medicine.

Shared Genomic Research Project

Under the direction of Dr. Jeff Sklar, first year residents in Pathology will work together on a project to get direct exposure to genomic pathology, designing and then building a real-time RT-PCR array to determine the tissue of origin for cancers with unknown primaries.

Molecular Testing on Autopsy Material

Funds are available for residents to explore further a disease process manifesting in one of the autopsy patients. The autopsy can be a comparatively limitless source of material for molecular testing, and many analysis remain possible even on post-mortem material.

Laboratory Medicine Rotation in Molecular Pathology

During the CP-2 year, residents take a rotation in the Molecular Pathology lab in Laboratory Medicine. Here they are exposed to a large number of tests, including screening for genetic disorders such as hemochromatosis and cystic fibrosis, minimal residual disease detection, and molecular techniques to identify a wide variety of infectious agents.

Additional Elective Rotations in Molecular Pathology

Residents may use their elective time to schedule more advanced rotations in molecular pathology in either the Department of Pathology or the Department of Laboratory Medicine

Supporting Laboratories & Units

Histology Laboratory

Dr. Brian West, Director
Cindy DeRiso, Manager

The Histology Laboratory is critical to many of the functions of Anatomic Pathology, representing the initial interface between patient specimens and the missions of diagnosis, teaching and research. Its services are central to the mission of the Autopsy and Surgical Pathology units within the Department. Over 100,000 blocks representing sections obtained from patient's specimens are processed annually. In addition to a highly professional and technically competent staff, the laboratory plays a significant and critical role in the complex integration among house staff and faculty, the ITS unit, the report generation unit and the molecular diagnostic laboratory, among other institutional units. From the moment a patient specimen is received in Surgical Pathology, it is given its own unique accession number, which is constantly tracked via the computer system. Virtually every step of tissue processing, sectioning, diagnosis, and report generation is interfaced with the computer, allowing efficient tracking from the beginning to the end of this process. In addition, a detailed, custom-built barcode based tracking system has just been implemented in histology that tracks each histology asset (block and slide) from the moment it is ordered until it is released from histology. Tracking begins in the gross room, where residents will need to scan barcoded cassettes as part of the entry process into the LIS, which verifies accurate and unique labeling of each cassette for patient safety purposes. A real-time dashboard monitoring system shows up-to-the-minute status of all blocks and slides, allowing for immediate quality assurance in regards to possible mishandling or misplacing of a given specimen. The tissue is sectioned, slides are stained, and the cases are forwarded to the Hot-Seat for histologic examination and dissemination to the resident responsible for the case. Numerous quality control procedures are utilized in this process.

It should be noted that for optimal slide preparation at the time of prosection, sections submitted should be 2 mm in thickness and occupy no more than 75% of the area of the cassette, features that will assure adequate preparation and optimal sections for histologic examination.

The histology laboratory incorporates the latest technology to facilitate and expedite the processing of tissues, including linear stainers, automatic coverslippers, cassette and slide engravers, and automated special stainers. A rapid tissue processor is also used to improve the workflow in the laboratory.

Immunohistochemistry Laboratory

Dr. Manju Prasad, Director
Cindy DeRiso, Manager
Mary Helie, QA/QC Manager

The role of immunohistochemistry in diagnostic pathology is to increase the amount of available information, in addition to what has been obtained from well established Anatomic and Clinical Pathology diagnostic protocols. Immunohistochemistry utilizes the sensitivity, specificity, and high affinity of antigen-antibody binding to localize a wide range of molecules that will help identify tissue type, tumor origin/differentiation, or receptor expression. This reaction can then be amplified

by using a secondary or "link" biotinylated antibody followed by a peroxidase-labeled streptavidin biotin complex. This is then followed by a chromogenic substance, diaminobenzidine (DAB) containing peroxidase; this enzyme's substrate reaction then oxidizes the DAB and precipitates a brown color at the binding site. There are modifications that may be beneficed when tissues contain high amounts of biotin.

The laboratory has an extensive a list of antibodies currently available. The list details clone, dilution, lot number, expiration, detection system, and any special pretreatment protocol. It also notes the positive control used. Staining can be nuclear, cytoplasmic, or membranous, depending on the location of the antigen. This information is provided for those who would like to quote it in manuscripts, in particular in the section dealing with immunohistochemistry methods. There is a comprehensive list of antibodies and staining patterns in the lab Procedure Manual and Antibody Logs. This describes staining patterns in both normal and neoplastic tissues. The specifics are beyond the scope of this summary, but residents are encouraged to come by the lab whenever they require information. Additionally, many of the companies maintain web sites that contain specification sheets.

All indirect Immunohistochemistry procedures are automated. Fluorescent Immunohistochemistry is performed manually.

One of the most important factors in indirect Immunohistochemistry is proper fixation and processing. Please adhere to Gross Room policies when submitting tissue for processing. Any deviations may result in suboptimal and inconsistent staining.

Electron Microscopy Laboratory

Dr. Gilbert Moeckel, Director
Margaret Ianniello, Manager

The Electron Microscopy Laboratory aids the diagnostic service of the Pathology Department by providing high quality micrographs of ultrastructural aspects of disease. The Lab processes an average of 600 cases a year. Approximately half are renal biopsies; the remaining submittals consist of surgical, autopsy, research, and cytology cases.

Best EM results are obtained from tissue trimmed to 1mm cubes and placed immediately into a 3% glutaraldehyde solution. Formalin fixed tissue and paraffin embedded blocks may also be submitted. A form, available in the gross room files, must be completed and included with the specimen. If a paraffin block is submitted, a light slide should also be sent with the area of interest indicated. Samples submitted to the EM Laboratory before 11:00 AM will be embedded that same day. An overnight polymerization of the resin-embedded tissue is necessary. Semi-thin (1-2u) sections are cut the next day using a glass knife. Slides of these sections are reviewed to confirm the desired subject. The resident may wish to review the slides at this point. The block is further trimmed and cut with a diamond knife providing ultra thin (600-800A) sections. An ‘after-thin’ section is cut with the glass knife as a quality control measure to be sure the correct area was sampled. The EM technicians scan the sections and acquire digital images of salient features using the Zeiss LIBRA 120 Electron Microscope. The resulting images are reviewed, evaluated, and diagnosed by the pathologist on service.

Each case is placed in a folder and is filed by the surgical number. An EM number is also assigned to each case sequentially on the order of arrival. Images are stored on recordable CDs and on the Pathology Department's Image Repository. Embedded tissue blocks are stored for future reference.

Molecular Diagnostics Laboratory (Pathology)

Dr. Jeffrey Sklar, Director, Molecular Diagnostics Program and Laboratory
Dr. Pei Hui, Medical Director, Molecular Diagnostics Laboratory
Monica Talmor, Manager

Molecular diagnostics is the application of the principles of molecular biology to the clinical evaluation of biological specimens from patients. This discipline arose from the advances in the understanding of molecular basis of disease and the introduction over the past several decades of sensitive techniques for the detection of molecular alterations in cells, tissues, and body fluids. The molecules constituting the markers utilized in molecular diagnostics include DNA, RNA, and proteins.

The Molecular Diagnostics Service in the Department of Pathology at Yale was established in 1994 and is primarily focused on the molecular diagnosis of cancer. Among the tests performed by this laboratory are: (1) the identification of clonality in lymphoid lesions by PCR-based analysis of rearranged immunoglobulin and T cell receptor genes; (2) PCR-based detection of DNA rearrangements associated with specific chromosomal translocations in lymphoma, such as those corresponding to the t(14;18) in follicular lymphoma and the t(11;14) in mantle cell lymphoma; (3) the detection of mutations in the K-Ras oncogene; (4) the detection of mutations in the p53 tumor suppressor gene; (5) RT-PCR based detection of gene fusions associated with chromosomal translocations in various types of sarcomas; (6) assessment of Her2/Neu gene amplification in breast cancer by fluorescence in situ hybridization (FISH); (7) PCR – based detection of microsatellite instability in the DNA of colonic and other carcinomas; and (8) detection of 1p and 19q chromosomal regions in oligodendrogliomas.

PCR based assays are applicable both to tissue frozen and to formalin-fixed tissue. However, certain fixatives, such as B5, although useful for morphology, are not generally well suited to evaluation of by techniques.

Additionally, the Molecular Diagnostics Service, as part of the larger Program in Molecular Diagnostics, is involved in the discovery of new diagnostic markers and the development and implementation of novel diagnostic methods designed to address specific diagnostic problems in cancer, various acquired, non-neoplastic diseases, and a number of inherited disorders and conditions.

A standard form is used for ordering these tests from the Molecular Diagnostics Service. Additional forms may be obtained by calling (203) 785-4492. Turn-around times vary according to the assay. Initial results should be available in two working days. The results are interpreted in conjunction with the histological findings, the expected parameters of sensitivity and specificity relevant to each test, internal controls, and external positive and negative control samples. Results are saved on hard copy and digitally for future retrieval. Residents are encouraged to participate in the Molecular Diagnostics Service. For further information, contact the Service directly.

Tumor Profiling Laboratory (Pathology and Lab Medicine) *(New 2011)*

Dr. Jeffrey Sklar, Director
Dr. Zenta Walther, Clinical Director
Dr. Mimi Wan, Technical Director
Karyn Ronski, Senior Technologist

The recently opened Tumor Profiling Lab at Smilow Cancer Hospital at Yale-New Haven is the first of its kind in Connecticut. Led by Dr. Jeffrey Sklar, Professor of Pathology and of Laboratory Medicine, and Director of the Molecular Genetics Pathology Fellowship, the service allows a patient's tumor to be evaluated in order to determine the optimal treatment plan. The hope is that the resources provided by the Tumor Profiling Laboratory will lead to better individualized treatment options.

As cancer treatment and therapy becomes more customized and personalized, the need for services such as this becomes greater. A growing number of newly developed drugs target specific mutant proteins within malignant cells, or target critical biochemical pathways that have been altered within malignant cells as a result of mutations acquired during tumorigenesis. Malignant cells may also possess mutations that render a tumor resistant to drug treatment, either because the mutation prevents a drug from binding to its target or because the mutation renders tumor growth independent of the protein targeted by the drug. Each new advance furthers the understanding of the molecular basis of cancer and leads to the introduction of new drugs that target the molecular alterations that underlie tumor development.

The laboratory is a Clinical Laboratory Improvement Amendments (CLIA)-certified clinical facility that performs high throughput genotype analyses of tumor DNA to predict the sensitivity or resistance of tumors to a variety of anti-neoplastic drugs. Oncologists are then provided with a detailed mutational profile of their patients' tumors so that treatment may be optimized on an individual basis, a process often referred to as "personalized medicine."

The lab is currently capable of high throughput genotyping of tumors for 60 mutations, but over time this number will increase to include many more. This facility reflects a growing recognition of the value of analyzing tumors for mutations in order to predict the likelihood of patient response or resistance to various drugs. Ultimately, the lab will offer full sequence analysis of tumor genomes for all patients treated at Smilow Cancer Hospital.

Information Technology Services (Pathology) *(Updated 2011)*

Dr. John Sinard, Director
Dr. Peter Gershkovich, Associate Director
Brian Daley, Clinical Information Systems Manager
János Löbb, Infrastructure and Core Hardware Manager
Katherine Henderson, User Support Manager

The Yale Pathology Informatics Program is a hybrid unit consisting of an academic component (with faculty, post-doctoral fellows, graduate students, and support staff) and a service/support component.

The service/support component, often referred to as the Operations Unit or the Information Technology Services (ITS) Unit, provides a broad range of computer, telecommunications, and electronic technology support for the department. The mission of the ITS Unit is:

- To provide a pathology clinical information system, including ongoing enhancements, which facilitates patient care, instruction and research
- To provide in-house expertise for the procurement, management, and maintenance of information technologies
- To support systems to gather, organize, and integrate information for use in patient care, research, teaching, and the management of the Department's programs
- To provide support and continuing education to our staff in the advancements of medical imaging and information design
- To explore the utility and deployment of new applications

Organizationally, ITS is divided into three areas of "focus", each with a manager. Because of extensive overlap in the responsibilities of each of these areas, the managers work closely together to provide integrated services to the Department. The Information Technology staff provides user support by offering both formal and ad hoc training for all new employees and retraining as needed. In addition, the Unit maintains hardware and software and troubleshoots user problems. The staff assists users in the retrieval of information to support teaching and research, and assists with the delivery of management of clinical services.

Yale Pathology uses CoPath Plus, a product of Cerner/DHT, as its clinical information system, but performs extensive customizations on a regular basis to better meet the needs of the department. The CoPath system is involved in every aspect of the processing of clinical material by the department, including specimen tracking, histology processing, specimen reporting, and patient billing, and is used for all anatomic pathology material received from YNHH as well as Bridgeport Hospital and departmental clinical outreach activities. There are an average of 10,000 log-ins to the CoPath system each month.

The Pathology Department manages its own network and central servers. The pathology local area network (LAN) is a subnet off the YNHH network, which itself is protected behind a firewall preventing unauthorized access from the outside world. The pathology network currently supports over 800 individual connections.

The Information Technology Services unit also provides direct user services to the members of the Pathology Department. Yale Pathology is again unique among the departments at both the hospital and university in the level of services provided intradepartmentally (most departments rely upon central institutional support for these activities).

The Informatics Program also develops software for clinical use. A number of custom applications have been developed and deployed within the department to facilitate the clinical workflow. These include a digital image management system, requisition imaging and filing system, slide tracking system, CPT coding database, a digital dictation system for transcription, histology asset tracking system, frozen section management system, a hot-seat diagnosis tracking solution, and an outreach support system. Whole slide imaging equipment is also available for teaching and research use.

For those residents interested in learning more about the clinical information system, the extensive in-house customizations we do provide residents an opportunity for exposure to aspects of information system management at any of several levels, depending upon their level of interest and background

experience: suggesting new features and workflow processes to improve departmental operations and seeing those modifications implemented; taking responsibility for managing dictionaries relevant to histology data entry; peeking "behind-the-scenes" at the system structure and data storage techniques; working with departmental faculty to program and develop advanced features. The Director of the Informatics Program gives resident lectures on digital imaging, networking, database structure, and data retrieval techniques.

Further information concerning ITS and an overview of the clinical information system may be found in the Resident Information Technology Manual.

Graphics and Imaging (Pathology)

Katie Henderson, Manager

The Pathology Graphics & Imaging Service is located in Brady, Room 161, and is accessible via the web site: www.yalepath.edu/PGI. PGI provides digital imaging and graphic services to the Pathology Department and the Yale Community.

Hours: Monday through Friday, 8:30-5:00 PM. (closed 1:00-3:00 daily). Requests may be dropped off on the door at any time, sent via email to photographics@yale.edu, or placed on the Pathsrv1 server, > PG_ORDERS share. Appointments are strongly encouraged. Please call (203) 785-6500 to schedule a meeting. Order forms are available on the door or may be downloaded from the web site. All work sent via email should include your name, contact information, due date, charging instructions and a description of the work needed.

Services include: imaging and preparation of 35mm slides for talks; slides shot directly from books; scanning 35mm and other material; web design; contact sheets from the digital imaging microscopes; and preparation of publication figures, large format posters, title banners, and illustrations. Brochures are available with a complete list of services, prices, and turn-around times. Additional information on slide set-up, file preparation, and various computer hints can be found on our web site.

Instrumentation and Data Processing (Laboratory Medicine)

Dr. Rodion Rathbone, Director
Helen Schweidler, Operations Coordinator

In today's highly automated laboratories, results can be generated at rates which can only be handled by computer. The Yale Clinical Laboratories were pioneers in laboratory information systems and today boast an extensive computer system which has been completely developed and maintained with in-house expertise. The same staff of computer scientists, programmers and engineers also carries out maintenance and repair of existing instrumentation as well as design and development of new instruments, instrument interfaces, and software. Over the course of the next year, this staff will be integrally involved in the migration of departmental workflow to a new commercial laboratory information system. Although there is no formal rotation in this area, the service is an integral part of all the laboratories, so learning occurs on a continuous basis. Those wishing more in-depth exposure may pursue research and development projects as part of a second year subspecialty focus. Projects are also possible in the Center for Advanced Instructional Media.

Report Generation Unit

Rachel Leftridge, Manager

The Report Generation Unit is responsible for the front desk reception, gross and final report generation and distribution for all patient reports, and all slide and record retention activities. Mondays through Fridays there are two shifts which work from 7:00 a.m. until 8:00 p.m.. On Saturdays, the unit works from 8:00 – 12:00 p.m. Other duties performed by the Report Generation staff consist of the management of consults/referral cases that are requested through the department. The staff in Report Generation performs all the clerical and administrative tasks necessary to support Pathology's mission.

Resident training will include instruction on the department's digital dictation system that is used for all gross diagnosis and most final diagnosis dictations. This training is designed to familiarize you with some systems basics. The Chief Resident will conduct or schedule a more in-depth and specialized training designed to integrate procedural information and system procedures. Please feel free to share feedback about, and suggestions for, improving our services.

Yale Pathology Tissue Services

Dr. David Rimm, Director, Yale Pathology Tissue Services
Dr. Alexander Vortmeyer, Director, Tissue Procurement Module, and Research Histology Module
Dr. David Rimm, Director, Tissue Microarray Facility Module
Lori Charette, Manager, Tissue Microarray Facility Module

The support of tissue-based research is a vital part of the mission of the Yale Pathology Department. In 1992, the Department instituted the Program for Critical Technologies to help facilitate the transfer of human tissue samples (fresh, frozen, and fixed) to University researchers. In 2007, the name of this program was changed to the Yale Pathology Tissue Services (YPTS). The tissue procurement module depends on the timely collection of specimens by residents and pathology assistants in the gross room. An important part of resident training is learning how to divide specimens so that both the goals of accurate clinical diagnosis and tissue banking are met. The program operates under four guiding principles:

1. The collection of tissue for research does not interfere with what is needed to achieve a diagnosis.
    a. Research tissues are taken only with the input of a pathologist, pathology resident, or pathology assistant
    b. Tissues are taken in pathology not in the operating room
    c. With the exception of fresh tissue, research tissues are stored but not used until the diagnosis of the case has been finalized
2. Tissue for research, and associated patient information is kept strictly confidential.
    a. Tissues are only distributed to researchers with an approved institutional review board protocol and only through YPTS
    b. Access to the databases and tissues of YPTS, for non-diagnostic purposes, is strictly limited
3. Tissue for research should be of sufficient quality to be analyzed by the most recent scientific techniques (e.g. for DNA/RNA microarray analysis and proteomics).

   a. Minimize the amount of "cold ischemia" time – the time from surgical removal to tissue processing – as much as possible
   b. Process tissues using techniques that maximize the usefulness of the tissue
4. Tissue archives are a scare resource and consequently the amount of tissue given out should be sufficient, but not in excess of what is needed.
   a. Protocols are discussed and approved by the Director of YPTS
   b. Tissues samples are provided using techniques that preserve the available tissue including tissue microarrays, core needle biopsies, etc.
   c. A small fee is charged for tissue disbursements

In addition to tissue procurement, a Research Histology unit supports both routine and specialized histologic services for researchers. These services include paraffin, plastic, and frozen tissue embedding and sectioning, as well as special stains, immunostains, and sectioning for molecular investigations.