Resident & Fellow Manual

July 1, 2017 - June 30, 2018

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Director of Surgical Pathology.....Christopher Curtiss, MD & Ola El-Zammar, MD

Director of Clinical Pathology .....Katalin Banki, MD

Director of Autopsy Service.....Robert Stoppacher, MD

Director of Cytopathology.....Kamal K. Khurana, MD

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Director of Hematopathology ..... Robert Hutchison, MD

Director of Immunopathology .....Sylva Bem, MD

Director of Microbiology ..... Scott Riddell, PhD

Director of Molecular Pathology ..... Shengle Zhang, MD

Director of Transfusion Medicine .....Matthew Elkins, MD, PhD

Chief Resident..... Daniel Zaccarini, MD

STATEMENT OF GOALS OF THE RESIDENCY PROGRAM AT SUNY UPSTATE MEDICAL UNIVERSITY

The goals of the program is to provide physicians with training and experience sufficient to prepare them for competent, independent practice in pathology and to provide an environment that fosters individual career aspirations within the discipline of pathology. Under the guidance and supervision of faculty, residents gain experience in the practice of Pathology and assume graded and progressive responsibility for their cases. Training consists of direct experience and responsibility in the management of clinical cases in a variety of settings and is supplemented and made more comprehensive by a planned curriculum of teaching conferences. Exposure to a broad range of experiences in Anatomic, Clinical and Experimental Pathology provide opportunity for residents to explore individual interests and serve as a foundation for a career in academic pathology or community practice. The success of the program depends on mutual respect between the faculty and the residents, as well as commitment by all to both the service and educational objectives.

The curriculum consists of a basic core of mandatory rotations in Anatomic and Clinical Pathology during the first three years and six months elective time. The curriculum consists of alternating months of Anatomic Pathology (24) and Clinical Pathology (18), as well as 6 months of elective rotations.

LIST OF REQUIRED ROTATIONS

ANATOMIC PATHOLOGY	Duration in Months
Autopsy Pathology*	4
Cytopathology	3
Surgical Pathology**	17
TOTAL AP	**24**
CLINICAL PATHOLOGY	Duration in Months
Bone Marrows	3
Clinical Chemistry	1.5
Cytogenetics	1
Flow Cytometry/Immunology/HLA	1
Hematopathology	3
Lab Management/Informatics	1
Microbiology	2
Molecular Pathology	1
Special Hematology	1.5
Transfusion Medicine	3
TOTAL CP	**18**

*Autopsy Pathology and Forensic Pathology are a single integrated rotation run by the Onondaga County Medical Examiner's Office (MEO), where residents perform forensic and medical autopsies under the supervision of the MEO staff. Autopsy cases at the Veterans Administration Medical Center (VAMC) are performed by the autopsy resident under the supervision of the VAMC staff pathologists.

**Surgical Pathology rotations will be characterized by increasing responsibility and decreasing need for supervision through the 4 years of residency. In senior years, it is expected that a resident who is successful in the program will take responsibility for directing PGY-1 residents and medical students on the service. At least 4 months of the surgical pathology will be done at Veterans Administrative Hospital. The surgical pathology rotation at University Hospital is the mainstay of training with exposure to a wide variety of challenging specimens in a tertiary academic environment. There is also a surgical pathology rotation at the Community Campus which provides an opportunity for residents to experience practicing in a community hospital setting. The rotation at VA Hospital provides residents with a community practice type of exposure that includes coverage of surgical pathology, autopsies and the clinical laboratory. This rotation also provides the opportunity to perform bone marrow aspiration biopsies.

List of Departmental Conferences

Name of Conference	Frequency	What subspecialty is included
Monday morning AP Conference	Mondays 8:00am 6717	Gross conference, MEO, Medical Autopsy and Cytology
CP Service Review	Mondays 9:00 AM 6717	All CP service labs
Clinical Pathology Conference I	Tuesdays 8:00am 6717	Transfusion Medicine, Hematopathology
Clinical Pathology Conference II	Wednesdays 8:00am East Tower UH	Immunology, Microbiology, Chemistry, Cytogenetics and Molecular Pathology
Cytopathology Journal Club	Bimonthly on Tuesdays 12:00pm 6717	Exfoliative and Fine Needle Aspiration Cytology
GYN Tumor Conference	3rd Wednesday 7:15am Marley Center	Gynecologic pathology
Neuropathology/Brain Cutting	Thursdays 8:00am Gross Room	Neuropathology
Resident Journal Club	3rd Tuesday 12:00pm 6717	Topic depends on the supervising faculty subspecialty
Research Seminar/Grand Rounds	Quarterly on Wednesdays 12:00pm 6717	Anatomic, Clinical, and Basic Research Pathology
AP Didactic	Thursdays 8:00 am 6717	Kidney, Lung, Neuropathology, Eye Pathology, Environmental, Gastrointestinal, GYN, Pediatric Path, Liver, Urology, Bone tumors, Breast, Head and Neck, Soft tissue, Endocrine, Salivary gland and Joint/Rheumatology
Surgical Pathology Unknown Slides	Fridays 8:00am 6717	All Surgical Pathology Subspecialties
Surgical Pathology Daily Review	Mon-Fri 4 PM	All Surgical Pathology Subspecialties

Interdepartmental Conferences

Thyroid Tumor Board	Monthly	3rd Wednesday	8:15 AM	6717 UH	Drs. Khurana and El-Zammar
Breast Tumor Board	Monthly	1st Friday	12:00 PM	Cancer Center 3th floor	Drs. Wang, Whiting and El-Zammar
Combined Toxicology Rounds	Quarterly	Thursdays	1:30–3:30 PM	MEO's Office	Dr. Marraffa
ENT/Head & Neck Tumor Board	Biweekly	2nd and 4th Wednesday	5:00 PM	Cancer Center 3th floor	Drs Fullmer and Valente
Gastrointestinal Pathology	Biweekly	1st and 3rd Tuesday	3:45 PM	6717 UH	Drs Mehta and Whiting
GI Tumor Board	Biweekly	Every other Monday	7 AM	6717 UH	Dr de la Roza and Whiting
GI, Liver and Pancreas Tumor Board	Biweekly	Every other Monday	4:30 PM	Cancer Center 3rd Floor	Drs Wang, Whiting and El-Zammar
Neuro-Oncology Tumor Board	Monthly	4th Wednesday	12:00 PM	6717 UH	Drs Fullmer and Corona
Oncology-Hematology	Weekly	Thursdays	10:00 AM	6717 UH	Dr. Hutchison
Orthopedic/Oncology	Weekly	2nd and 4th Wednesdays	7:15 AM	3430 UH	Drs. Valente/ Naous
Oncology Path	Monthly	Last Wednesday	4:00 PM	6717 UH	Drs de la Roza and El-Zammar
Pediatric-Oncology Tumor Board	Monthly	1st and 3rd Tuesday	4:00 PM	6717 UH	Drs. Zhang and Fullmer
Pulmonary	Monthly	1st Wednesday	7:30 AM	6717 UH	Drs Curtiss and El-Zammar
Thoracic Oncology Program Clinic (TOP)		2nd and 4th Wednesday	1:30 – 3:00 PM	Cancer Center 3th floor	Drs. El-Zammar and Curtiss
Transfusion Committee	Quarterly	Thursdays	3:00 PM	6717 UH	Dr. Elkins
Genitourinary Tumor Board	Biweekly	Every other Monday	7:00 AM	6717 UH	Drs. de la Roza and Whiting

Scholarly Activity

The residents are required to participate in our academic environment through teaching and research. Residents will prepare presentations for journal clubs and educational conferences on a rotating basis. There are many opportunities for residents to be involved in research. Residents are not only encouraged to participate in ongoing research with faculty members, but also to explore ideas that may result in research projects and publications. This is considered a valuable learning experience and an important part of the residency program, regardless of the eventual practice setting for the individual resident. The academic work may also include development or improvement of clinical diagnostic methods and reviews of existing literature. This manual contains a section with details on the research and clinical interests of each faculty member.

Evaluation of Residents

Residents are evaluated in writing by the faculty involved in each rotation**. These evaluations are based on the six areas of competency defined by the ACGME: patient care, medical knowledge, practice-based learning, interpersonal and communication skills, professionalism, and system-based practice (see Appendix for definitions). A summary evaluation based on these written evaluations and discussion with the faculty will be made by the program director twice a year. This summary evaluation will then be discussed with the resident by the program director. At this time, there will be an opportunity for clarification of issues which have arisen and planning for the resident's future.

These evaluations are used to determine progress and growth of competence of the resident in pathology and will be used in decisions about promotion and retention from year to year, assignment of advanced status (such as selection of chief residents) and appropriateness of recommendations to sit for the ABP exam.

Evaluation of the Program

Residents should submit formal written evaluations of the program and faculty annually and evaluations of each rotation at the conclusion of such**. These evaluations are anonymous. Residents also have the opportunity to address issues in confidence with the program director at any time, but especially at the semi-annual meetings. The program director assesses issues brought to his attention and may present them to the Residency Advisory Committee and Department Chair when appropriate.

** All evaluations are done electronically using the MedHub internet-based system.

Supervision of Residents

All cases to be signed out by residents in all laboratories will have an assigned attending physician or Ph.D., who is responsible for the case and provide supervision; the attending is identified electronically and on hard copies.

Residents may expect increasing levels of responsibility in the work-up and management of cases as they progress through their training. The level of responsibility given to a resident in each case is at the discretion of the designated supervising attending. At no time, however, will a resident function without clear and readily available 24-hour attending supervision.

Levels of Supervision

1. Direct: the supervising attending is physically present in the room
2. Indirect supervision with direct supervision immediately available: the supervising attending is physically present and available within the hospital.
3. Indirect supervision with direct supervision available: the supervising attending is available by phone or e-mail and can come in to the hospital, if needed, to provide direct supervision.
4. Oversight: the supervising attending provides review and feedback.

Levels of Trainees

Advancement to the next training level is determined by the program director, based on faculty evaluations.

I. Beginner level: PGY-1 residents
II. Intermediate level: PGY-2 residents
III. Advanced level: PGY-3 and PGY-4 residents and sub-specialty fellows

I. PGY-1 residents

Initial phase:
PGY-1 residents must be **directly supervised** during performance of at least three initial procedures in the following areas:

1.autopsies (complete or limited)
2. frozen sections
3. apheresis
4. fine needle aspirations and interpretation of the aspirate

Gross dissection of surgical pathology specimens by organ system:
5. dissection of GI
6. dissection of prostate
7. laryngectomy
8. lung lobectomy
9. thyroidectomy
10. breast lumpectomy
11. mastectomy
12. hepatic lobectomy
13. colectomy

PGY-1 residents will enter the performed procedure into the MedHub system for approval by a supervisor.

Second phase:
After performing the required number of procedures and with the permission of the Program Director or Associate Program Directors, PGY-1 residents can perform the procedure **supervised directly or indirectly with direct supervision immediately available**. The person providing immediately available supervision has to be in the hospital.

Supervision can be provided by attending pathologists, advanced residents (PGY-3, PGY-4), fellows and pathology assistants named by the Director of Anatomical Pathology or Director of Clinical Pathology.

If a listed procedure is not performed during the first year of training, direct supervision and credentialing will be required when it is first performed.

II. PGY-2 residents
Intermediate level residents can perform autopsies, dissections, frozen sections, FNA, apheresis and bone marrow aspiration under direct or indirect supervision.

III. PGY-3 and PGY-4 residents
Advanced level residents can perform autopsies, dissections, frozen sections, FNA, apheresis and bone marrow aspiration under direct or indirect supervision. They can provide supervision to junior trainees.

Faculty Involvement for All Levels

In addition to the four levels of supervision of procedures, there are other circumstances that require immediate faculty involvement/approval. The resident can seek faculty involvement at any time when he/she believes that the help of an attending is needed. On regular shifts, the resident will try to contact the attending who is responsible for the case. If this attending is not available, the attending on service will assume responsibility. In an emergency, any attending might be asked for involvement. On-call, the resident will contact the on-call attending, who then assumes responsibility.

Common circumstances that require immediate involvement of faculty:

- Grossing complex specimens, when the resident believes that the help of the Surgical Pathology attending is needed. Concern of anyone, including technologists, that a situation is more complicated than a resident can manage effectively.
- Frozen section diagnosis
- Fine needle aspirate, sample adequacy
- Ordering ancillary testing on a limited or one of a kind sample
- Canceling a test order on an unstable specimen
- Critical change in a diagnosis
- Error in a diagnosis
- Notification of clinician regarding a newly diagnosed malignancy

Work Environment

Didactic and clinical education are balanced with concerns for patient safety and resident well-being. Education has a priority in the allotment of residents' time and energy and are not compromised by excessive service obligations. In addition, didactic and clinical duty hour assignments recognize that faculty and residents collectively have responsibility for the safety and welfare of patients.

Duty Hours

Duty hours are defined as all clinical and academic activities related to the residency program; i.e., patient care (both inpatient and outpatient), administrative duties relative to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled activities such as conferences. Duty hours do *not* include reading and preparation time spent away from the duty site.

1. Duty hours can not exceed 80 hours per week, averaged over a four-week period.

2. One day per week has to be free from all service and educational duties, averaged over a four-week period.

3. Assigned work periods can not exceed 16 consecutive hours for PGY-1 residents and 24 hours for PGY-2-4 residents.

4. Moonlighting is not permitted.

Minimum Time Off between Scheduled Duty Periods:

PGY-1 and PGY-2 residents should have 10 hours and **must have 8 hours** minimum time off between scheduled duty periods.

PGY-3 and PGY-4 residents and fellows must be prepared to care for patients over irregular or extended periods. At least 8 hours free of duty is preferred, however, PGY-3 and PGY-4 residents may return to duty with fewer than 8 hours of rest in exceptional cases, if required by intra-operative consultations, apheresis, emergent autopsies (e.g., when a patient's religion requires rapid burial), fine needle aspirations, immediate evaluation of cytology or transfusion medicine and hematologic emergencies. These occurrences must be reported to the program director.

On-call:

There are no in-house on-calls. Residents are on call from their home.

PGY-1 residents are not on-call.

At home on-call does not count toward duty hours. If the trainee has to come to the hospital during an at home on-call period, time spent at the hospital counts toward working hours; this, however will not initiate a new "off-duty period".

In addition to adhering to the schedules that have been made up to accommodate these rules, you are to contact your supervisor and/or your attending whenever you feel tired. It is the responsibility of your direct supervisor and/or your attending to allow you to go home with no penalty or negative rating or other consequence on your residency record.

If you find that you are not provided with relief at these times or have reprisals taken against you, you should bring these issues to the direct attention of either the Department Chair or the Residency Program Director.

Transition of Care

Fatigue, Fitness for Duty

Fitness for Duty:
Residents and Fellows are educated about self reflection on "Fitness for Duty". Alcohol or illicit substance use is incompatible with fitness to provide medical care to others. Excess fatigue, medical or psychiatric illness, the use of medications that significantly impair dexterity, grief that precludes concentration or acute illness that would make the physician a risk to others (ex. infectious illness) may preclude participation in the workplace.

A resident or fellow who does not feel fit for duty should consult with the program director or Employee Health.

A supervisor, who has concerns regarding a resident or fellow's fitness for duty should consult with the Program Director and/or Associate Dean for Graduate Medical Education.

The Chief or Program Director will schedule another resident to cover the services.

Transition of Care due to Fatigue or Fitness for Duty:

1. The resident calls one of the Chiefs or the Program Director to report a need for transition of care. (Voicemail messages are not satisfactory.)
2. They will discuss the work type and duration for which coverage is needed. The Chief will ascertain what responsibilities need to be covered to ensure safe, comprehensive transfer of duties to the covering colleague.
3. The Chief or Program Director then will try to schedule another resident to cover the services. This will occur each day for which the resident is unfit for duty/sick.
4. If possible, the resident will discuss the cases with the supervising attending and the covering resident before leaving.
5. The resident/fellow will also inform the Residency Coordinator (voicemail or email is acceptable).
6. If another trainee cannot cover the service, the Chief or the Program Director contacts the resident's attending/supervisor who assumes responsibility for the service/cases.

Audit of Cases

During the following rotations 1-5 randomly selected reports will be audited: Surgical Pathology, Bone Marrow, VA Pathology, Autopsy, Hematopatholgy. The audits will be conducted by an attending designated by the Director of the rotation. The audits will assess accuracy of morphologic description, completeness of ancillary studies, turnaround time, adherence to reporting formats and accuracy of diagnosis. The results will be reported in the monthly evaluation.

Quality Improvement Projects

Chemistry and Special Hematology rotations: During the rotation, the resident will review one laboratory procedure in the Laboratory Manual. The procedure will be chosen by the attending. The resident will assess the literature, check regulatory standards, site visit results, recent proficiency testing and conduct an audit of the procedure. The resident suggests changes to the procedure and presents the findings to the attending.

USMLE STEP III EXAM

The Pathology Residency Training Program recommends that all residents pass Step III by the end of their PGY-2 training and requires that residents pass Step III by June 1 of their PGY-3, prior to their final year of training. If the resident does not pass USMLE Step III, he/she will not be promoted to their final year and the terms of his/her resident appointment will be null and void. The resident may be continued at the same level, or the resident's continuation in the program may be in jeopardy.

A maximum of three (3) business leave days will be allowed for the taking of Step III. Two days for the exam, ½ day before and ½ day after for travel, if needed. These three days are included in the five days total available per academic year.

ADMINISTRATIVE ISSUES

RESIDENCY & FELLOWSHIP Administrator

The residency administrator, Karen Kelly, is located in Weiskotten Hall, Room 2292. Office phone number is 47117.

BOOK AND TRAVEL ALLOWANCE FOR PATHOLOGY HOUSESTAFF

$1,000 educational fund each year. Monies may be carried over from year to year.

When you want to order books, purchase them and then provide the Residency & Fellowship Administrator the original receipt and credit card statement reflecting the charge.

The Department of Pathology will provide funds to trainees who are the principal authors on a presentation or a poster. Travel will be reimbursed based only on original receipts submitted. Travel-related expenses will be covered for each day of presentation and two additional days, one of which is for transportation, for a maximum of $1000. Any additional expenses will be the responsibility of the resident/fellow and can be taken from their educational fund.

BEEPERS

You will be assigned a pager within a few days of your arrival. You will keep that pager throughout your training and return it before you leave, or your certificate will not be issued. If you lose your pager, report it to the residency program administrator. There is a supply of batteries for the pagers in the AP front office.

KEYS

Keys to the Anatomic Pathology and Clinical Pathology floors are obtained through the residency administrator's office (2292 WSK). Keys must be returned to the administrator upon the completion of your training. No certificate will be issued until they are returned.

LONG DISTANCE TELEPHONE

Upstate employees are assigned a 6-digit authorization code for long distance access. Please do not allow other personnel to use your authorization code. Only business long distance calls should be placed from telephones in Upstate Medical University. You will be asked to confirm that calls identified by your authorization code are business related.

To place a long distance call, enter:

6 digit authorization code - # - 9 - Area Code - Number

LAB COATS

The department will provide two white laboratory coats per house officer (laundry service provided).

MAILBOXES

Every pathology resident and fellow has a mailbox: in Room 6803 UH. All correspondence with department members will be through your mailbox in the department. Most housestaff members choose to use the departmental mailbox for delivery of journals, etc. You should check and empty your mailbox frequently.

LEAVE FOR MEETINGS

Leave for attending scientific meetings, subspecialty conferences or training, sitting for Board or USMLE licensing examinations including travel time (one half day prior to and one half day following presentation or meeting), will be treated as business leave (indicated on your time sheet as "BL"), not to exceed five (5) working days per year (including presentations at meetings). As in the case for vacations, it is necessary for the resident/fellow to secure appropriate prior approvals from the supervisor of the rotation and the program director, and arrange coverage.

Attendance at non-approved meetings such as Board-review type courses and time spent job interviewing must be considered as vacation time.

Please make sure to check with the Program Administrator before registering for any conference to ensure that the funds are available.

CHANGE OF ADDRESS

The Department of Pathology and the Office of Graduate Medical Education must know your address and telephone number at all times. If you move, and upon completion of training, update your information in MedHub, and notify Payroll.

CONFERENCES

Attendance at weekly conferences is mandatory. Each resident/fellow is required to attend at least 85% of the conferences. A low attendance will be cause for concern. Conference attendance will become part of your semi-annual evaluation with the program director.

It is your responsibility to inform the Chief Resident if there is an instance where you must miss a conference due to a conflict. Otherwise you will be marked absent.

DRESS GUIDELINES

Purpose: To establish minimal acceptable standards of dress for SUNY Upstate Medical University Department of Pathology Residents and Fellows.

1. No sweat suits, shorts, athletic wear or non-approved lab jackets/scrub suits may be worn.
2. Jeans may not be worn.
3. Shoes are to be neat and clean. Tennis/athletic shoes are not permitted. Open toed shoes may not be worn in patient care areas.
4. Dress and personal hygiene, which are considered in poor taste or disruptive, may be addressed by Program Director or supervising faculty.

LEAVE

Family Leave

The Family and Medical Leave Act (FMLA) gives eligible employees the right to take unpaid leave for a period of up to 12 work weeks in a 12-month period (calendar year for State employees). Eligible employees are those who have completed one year of service and have worked, or otherwise were in paid status, for a minimum of 1,250 hours during the 12-month period immediately preceding departure on leave. Under certain conditions, FMLA leave may be taken on an intermittent basis. Employees are also entitled to continuation of health and certain other insurances, provided the employee pays his or her share of the premium during this period of leave. If an employee desires to take FMLA leave, but the Health Science Center Office of Human Resources is not made aware of the reason, the employee must notify his/her supervisor of the reason for the leave no later than two business days of returning to work. Absent of such timely notification, she cannot assert FMLA protection for absence.

Leave is available for the following circumstances:

- Placement of a child in the resident's home for adoption or foster care.
- Birth of a child to the resident or the resident's spouse.
- The need to care for a family member with a serious health condition.
- The resident's own serious health problem.

Residents with scheduled family leave should contact the Office of Graduate Medical Education and hospital personnel offices concerning maintaining their health care coverage while on leave without pay. Questions regarding the application and interpretation of the leave policy should be directed to the Benefits Office in Jacobsen Hall.

Maternity

Early consultation with the director of the Residency Training Program is very important. Some rotations present fetal risk. Pregnant residents should contact their program director promptly regarding such risk. Pregnancy is considered a short-term disability. Maternity leave can consist of vacation, sick leave, or leave without pay in any combination. Additional information can be obtained from the Personnel Benefits Office.

Sick Leave

All full and part-time faculty and professional staff employees earn sick leave credits on the same basis as vacation credits, and may accumulate up to a maximum of 200 sick leave days. If you are sick, notify one of the chief residents and the residency coordinator. The chief resident with whom you speak will let you know if anyone else needs to be notified.

Vacation

The present contract provides for 15 working days of vacation for the first year of service at SUNY Upstate, (16 for the second year; 18 for the third, fourth and fifth years; 20 for the sixth year), and increasing to a total of 21 days per year for the seventh year and beyond. Vacation may be scheduled in advance of actual accrual.

All requests for vacation or travel arrangements are to be submitted by a proper request form no less than one week in advance. All vacation requests need the approval of the chief resident, attending(s) on service for that rotation(s), and the program and division directors. In order to assure adequate service coverage, these requests should first be cleared through the Program Director's Office. Approval is not automatic, and depends on staffing, schedules, service responsibilities, etc.

If vacation is taken for more than one week from any rotation, any missed time over one week has to be made up later, during elective rotations or a rotation on another service. This has to be approved by the program director.

When two residents have been assigned to a rotation, only one may be on vacation at any time. Each resident requesting vacation must arrange their own service coverage.

New residents and residents continuing in the program are not to schedule vacation during the last three weeks of June or first weeks of July. Residents are expected to be judicious in the timing of vacation, with primary concern for patient care, as well as consideration towards their colleagues, both resident and faculty.

If you are scheduled at the VA or the ME's office and it is a legal holiday for that facility (i.e., Presidents' Day), but NOT for SUNY, you may take the day as vacation or holiday comp. Or if you do not wish to charge your accruals, you may report to AP and spend the day reading.

MOONLIGHTING
Moonlighting is specifically forbidden.

PROMOTION, PROBATION AND DISMISSAL
Policies and procedures regarding academic promotion, probation, and dismissal are printed in the *Housestaff Handbook* published by the Office of Graduate Medical Education (Room 1814 UH) as well as in the front of the Residency Manual.

AP RESIDENT ON-CALL RESPONSIBILITIES

The Anatomic Pathology (AP) services at University Hospital and Veteran's Administration Medical Center must be covered 24 a day and 7 days of the week. Night, weekend and holidays call includes surgical pathology, frozen sections and autopsies. Night coverage begins at 5:00 p.m. each night until 7.30 AM . Residents are expected to perform autopsies and frozen sections under the supervision of an attending pathologist.

The resident is often the first person contacted by clinicians requesting rush processing on a specimen. Any request for rush processing must be approved by an attending. Be sure to get the name and beeper of clinician to be called with the results.

If you are called for a frozen section, find out the OR room number and surgeon's name, and then call the attending on-call (try the home number first and then the beeper or cell phone). If it is a In addition, residents may be asked to come in during off-hours to take care of specimens that require prompt routing or special handling. This may include lymph node protocols, fixing tissue for immunofluorescence, and determination of cellularity and adequacy of FNA specimens. It is expected that after a short time on service, residents will be able to perform these tasks independently after getting the approval of the attending on-call.

Lymph node protocol

Lymph node protocols should be performed according to the procedure outlined in the gross room manual (i.e., touch imprints, formalin fixed sections, and RPMI for flow cytometry. Tissue for flow cytometry (lymphocyte typing) needs to be stored for processing by the technologists on the next regular workday. Solid tissue should be stored in culture media (RPMI 1640) which is available in the refrigerator in the Gross Room, and then stored in the refrigerator. Snap frozen tissue is to be stored in a sealed plastic envelope or other leakproof container, with a label with the patient's name inside the container. The container itself is to be stored in -70ºC freezer located in Histology. Remember, if cultures are indicated (by clinical history), handle the lymph node with sterile gloves and instruments and separate the piece for culture first. This is often best done by the surgeon in the OR while the specimen is still in a sterile field. The piece for culture with appropriate requisition forms should be taken to the specimen processing area in CP.

Fluids for Lymphocyte Typing (pericardial or pleural effusions, etc.) should be spun down to a pellet and then gently resuspended in culture media, after which they can be stored at room temperature.

REMEMBER TO LABEL ALL CONTAINERS AND TUBES WITH THE PATIENT'S NAME AND HOSPITAL NUMBER - If problems arise, you can contact Donna in Dr. Hutchison's laboratory.

Immunofluorescence

Tissue for which immunofluorescence has been requested must be received fresh, on saline-soaked gauze. During off-hours, the specimen should be bisected, with half-fixed in formalin and half in Michel's solution (available in the OR and Histology). Do not put Michel's fixative in the refrigerator. If a frozen section has been made, the surface of the frozen block can be covered in OCT to prevent drying, and the block and chuck stored at -70°C for later use in immunofluorescence.

Kidney Biopsies

You may be asked to submit a kidney biopsy for processing. Kidney biopsies are treated differently than other tissues. Get the patient's name, the physician's name and beeper number, and then call Dr. Shanley (cell 315-897-7500) and Kathy Sayles (cell 315-436-5008) for specific instructions (i.e. taking tissue for EM).

All kidney biopsies are fixed in Zamboni's solution for LM & EM and in Michel's (Zeus) fluid for IF. These are available in Histology and in the OR. If you cannot reach Dr. Shanley or Sayles, leave the biopsy in Zamboni's and Michel's and it can be rush processed the next business day.

Cytopathology

Cytopathology laboratory hours are 0800 to 1700, Monday through Friday. For specimen collection procedures, Health care providers may be referred to the Cytopathology Clinical Reference Manual.

You need to schedule an appointment to come into the Cytopathology Laboratory to **review the preparation procedures prior to assuming on-call responsibilities**. Any stat request for Cytopathology testing after laboratory hours should be communicated to the AP attending on call to verify the necessity and to determine what accommodations are needed. Stat requests most frequently involve cerebrospinal fluid (CSF), bronchoalveolar lavage (BAL) and fine needle aspiration specimens. CSF cytospins can be prepared in CP at the Chemistry laboratory.
CSF stat requests are prepared by the Anatomic Pathology resident on-call who will consult with either the Clinical Pathology Attending on call when there is a question of hematopoietic malignancy or the Anatomic Pathology Attending on call for all other diagnoses.

The Cytopathology Laboratory manual is located in the Cytopreparation room 2141A. Refer to the procedures and operating instructions prior to performing any procedure.

All cerebrospinal fluid specimens for Cytopathology, whether inpatient or outpatient, **MUST BE BROUGHT DIRECTLY TO THE CYTOPATHOLOGY LABORATORY AND REFRIGERATED**. If it is absolutely necessary to obtain a cerebrospinal fluid for an immediate evaluation during off hours, the specimen is to be prepared by the **Clinical Pathology resident on-call** who will consult with the Hematopathology attending, when appropriate (leukemia, lymphoma). The diagnosis that is communicated to the physician requesting the rush diagnosis should also be written in the blank area of the Cytopathology requisition. The person to whom the results were given, the name of the physician(s) who rendered the diagnosis, as well as the date and time also need to be recorded on the Cytopathology requisition. The slides are to be left in the Cytopathology Laboratory (2141 WH) with the completed requisition on the multi-headed microscope table.

STAT requests for GMS stains of bronchoalveolar lavage (BAL) fluids for detection of Pneumocystic carinii are the responsibility of the AP resident and attending on call. Be sure to familiarize yourself with the proper procedure before going on call. STAT requests for immunofluorescent stains are handled through Clinical Pathology (see Microbiology/Virology section of the CP RESIDENT'S ON-CALL RESPONSIBILITY section).

If there is a request to perform a fine needle aspiration or provide a diagnosis on a fine needle aspirate after laboratory hours, the Anatomic resident will consult with the Anatomic attending pathologist.

All fluids for cytopathology should be stored in the refrigerator for routine processing on the next regular work day. STAT requests for Cytopathology are not accepted unless approved by the attending on-call.

CP RESIDENT ON-CALL RESPONSIBILITIES

General
Prepare Service Review Report.
Check technical staffing in each section.
Assess major equipment in each section and computer for malfunction.
Consult with on-call attending clinical pathologist as needed.
Be familiar with resident responsibilities as per disaster plan, which is located in the Pathology Safety Manual.

Chemistry
Review clinical history of all extraordinary toxicology requests and communicate with the clinician as needed.
Review requests for tests for appropriateness of medical necessity.
Review requests for special STAT chemistry tests.

Cytogenetics
Routine Cytogenetics services are not offered after normal laboratory hours (0800 to 1700, Monday through Friday). The Cytogenetics Laboratory is staffed Saturday 0800 to 1630. On-call service is available after hours or weekends - see the on-call list posted at the Clinical Pathology Front Desk or in the AP/CP residents' rooms.

For all specimens received after hours or on weekends, see the on-call list and contact the appropriate Cytogenetics Laboratory personnel.

Requests for stat testing should be reviewed with on-call cytogenetics personnel or the Cytogenetics Laboratory director before agreeing to perform the service.

If there are any questions regarding appropriate specimen handling or disposition, contact the appropriate staff member as indicated on the on-call list.

Hematology
Check with technologist in charge of Hematology, review abnormal blood films by 1000 on weekends or holidays, as requested, and sign CBC slips. Consult with hematology fellow (or attending) on call, as necessary, and notify clinicians of any important new findings.

Follow through on abnormal coagulation studies brought to your attention, insuring that appropriate definitive studies are performed and reported.

Perform blood and bone marrow Wright-Giemsa and peroxidase stains when necessary.

Transport fixed bone marrow biopsy and clot section specimens to the Histology Laboratory in Anatomic Pathology. Bone marrow biopsy and aspirate clot sections are fixed in freshly prepared B-5 fixative (9 parts B-5 stock solution and 1 part 37% formaldehyde, available in the bone marrow processing area) for 2 hours and then transferred to 70% ethanol (available in the bone marrow processing area).

DO NOT allow specimens to fix for more than 2 hours in B-5. The technologists in the core lab or the processing area can assist by transferring the specimens from B-5 to 70% ethanol after 2 hours. The fixed specimens in 70% ethanol are then decalcified and processed by the Histology Laboratory.

The processing of lymph node biopsies is the responsibility of the AP resident on-call (see page 46).

Immunology/Flow Cytometry/Electron Microscopy
Perform cryptococcal antigen test when necessary. The processing of tissue for immunofluorescence is the responsibility of the AP resident on-call.

Specimens for flow cytometry should be kept at room temperature in Heparin tube or diluted in RPMI + 10% FCS. If a stat specimen (i.e. acute leukemia) requires immediate attention, notify the immunology technologist on call after consulting the attending on call.

LIS
Computer staff will notify on-call resident of any downtime and an estimate of when the system will be up.

If downtime is of an extended period, implement computer disaster plan.

Notify units of downtime if reporting systems are affected.

Microbiology/Virology
Approve and read "STAT" acid fast stains.

Notify physicians of positive blood and spinal fluid cultures if the laboratory staff cannot locate the physician, and notify physicians of positive acid fast results.

Insure optimal collection and plating of unusual cultures, i.e. lung aspirates, brain abscess, lung abscesses, etc.

STAT requests that must be approved by either Pediatric or Adult Infectious Disease attendings (depending on the age of the patient):

Influenza A antigen
RSV antigen
Legionella DFA
Pneumocystis DFA

Residents are expected to perform STAT RSV and Influenza antigen tests after hours, i.e. after 4:00 p.m. on weekdays, after 2:30 p.m. on weekends.
All other STAT requests must be approved in conjunction with Drs. Forbes or Kiska. If they are not available, involve the Infectious Disease attending on-call.

If the STAT tests are approved, notify Virology personnel by use of the re-call list posted in Microbiology.

Note: Under certain circumstances, you may be expected to process specimens and perform cell culture inoculation for viruses with the aid of Virology personnel via phone.

Note: If STAT requests are made by Pediatric or Adult Infectious Disease attendings, no further approval is required.

Molecular Pathology
Routine Molecular Pathology Laboratory services are not offered after normal laboratory hours (0800 to 1700, Monday through Friday).

Specimen requirements: Adults and children - 10 mL EDTA; infants, 1-2 mL EDTA (pediatric tube). Store at room temperature; receipt Monday through Friday, within 24 hours of collection.

Refer to the Molecular Pathology procedure manual located in the main lab (Rm. 3814) for more specific details (i.e., for gene rearrangement assay, see section 200.4). Part Two of the Molecular Pathology procedure manual contains procedures for each test that is currently offered clinically. Each procedure has a subsection titled "specimen (sample) collection and transport" which details sample requirements and handling.

Any requests for STAT testing should be reviewed with the director (Dr. Antony E. Shrimpton) or the technical supervisor.

Transfusion Medicine

Review requests for:

Fresh frozen plasma: more than 4 units per patient or any volume in a patient with normal coagulation studies.

Platelets: single donor units, MLA pheresis products. All platelet requests, especially those exceeding 6 units should be reviewed to determine if appropriate.

Leukocyte reduced packed red cells, washed red cells, frozen red cells, requests for irradiated blood.

Contact ordering physician if blood component order form does not have an appropriate indication noted. Consult with attending if necessary on unusual circumstances. Record changes in orders and rationale for unusual orders on blood component order form. If an order is not changed and seems inappropriate, bring information to supervisor's attention for review by Blood Utilization Review Committee. Follow-up cases for who orders were canceled. Note any adverse outcomes that may have resulted from use of the guidelines.

Follow-up transfusion reactions by ascertaining present status of patient, necessary emergency therapy, if any, desired follow-up laboratory assessment and future blood requirements by clinicians with a verbal preliminary report to clinicians. Any hemolytic transfusion reaction requires your presence at the bedside immediately and to promptly telephone the attending clinical pathologist. Present written report to Transfusion Medicine attending within 24 hours (including weekends).

Check the Transfusion Medicine inventory and be aware of any blood shortages (especially O negative).

Be aware of antibody work-ups in progress and communicate antibody or crossmatch problems to the appropriate physicians.

Review blood orders for Monday surgery. Complete OR schedule and compare with "Guidelines for Ordering Blood for Elective Surgery".

If a request is made for an emergency therapeutic apheresis on the weekend, the resident is required to evaluate the request and make recommendations to attending apheresis physician in regard to treatment. The resident must be on site during the apheresis procedure.

OUTSIDE ELECTIVE POLICY

All electives outside institutions affiliated with SUNY Upstate Medical University must **first** be presented to the Program Director for approval. Both the Chair of Pathology and the Dean of the Medical School must then approve it, and then approval MUST be obtained by the Graduate Medical Education office before an outside elective will be granted.

Six (6) months advance notice is required to provide the Graduate Medical Education office sufficient time to ensure affiliation agreements/contracts are in place.

It is required that the resident demonstrate justification for such elective. This justification must include the following:

1. Name of Institution and Program Director (with address and phone number)
2. Name and length of elective rotation and name of Direct Supervisor
3. Specific responsibilities/duties and range of clinical activities of the resident during the rotation
4. Statement regarding ACGME program accreditation
5. Statement regarding malpractice liability and disability insurance coverage for resident while on elective rotation at outside facility
6. Explanation why you feel this elective should be approved (What will you get out of this rotation)

NOTE: IF APPROVED
Resident will stay on SUNY payroll (with vacation/sick leave and health insurance benefits). Malpractice insurance through SUNY ordinarily will **NOT** cover the resident while on rotation at the outside hospital. Outside institution needs to provide malpractice liability and disability coverage. We will need assurance from the outside hospital that they will provide an evaluation on the resident's performance for this elective rotation. The resident **may** require health clearance and proof of appropriate credentialing prior to being accepted for elective rotation. This is the resident's responsibility. There is no institutional provision for payment of housing/meal expenses for the resident while on elective rotation. Graduate Medical Education Office needs a copy of the correspondence for their records.

RESPONSIBILITIES OF THE CHIEF RESIDENTS IN ANATOMIC/CLINICAL PATHOLOGY

- Prepare the rotation schedule.
- Ensure smooth operation of departmental conferences.
- Direct supervision during credentialing of new residents.
- Coordinate and pre-approve residents' vacation and business leave for subsequent approval by clinical service and residency program directors.
- Facilitate the relationship between residents and faculty to maximize learning and service efficiency.
- Determine from each resident during each rotation whether problems exist.
- Record resident and faculty attendance at conferences.
- Help in the organization of the annual orientation of new residents to AP and CP, and direct the tour of the department.
- Attend Residency Review Committee meetings and other departmental administrative meetings, as required.

ANATOMIC PATHOLOGY ROTATIONS

GENERAL GOALS IN ANATOMIC PATHOLOGY

The following are goals for Anatomic Pathology training for all residents. They are flexible and certainly should not be considered final. Nonetheless, the context of these goals is defined by the time and resource constraints of pathology practice and by the fundamental principle that our efforts must always serve the patient.

1. Learn to use gross inspection, routine histology, cytopathology and special investigations to formulate differential diagnoses, arrive at diagnoses, and solve clinical problems.

2. Learn to communicate your findings and conclusions clearly, in a manner useful to all appropriate audiences, especially clinicians. Skill in both oral and written communication is critical.
3. Learn to constantly update and expand your knowledge of facts, terminology, and classifications of disease. Clinical correlations are often key to meaningful diagnosis, problem solving, prognostication and thus effective pathology consultation. Furthermore, understanding limits of knowledge is essential to obtaining assistance in difficult situations.
4. Maintain enthusiasm for continued learning. Nurture your familiarity with bibliographic resources. Learn how to critically evaluate literature. Recognize and apply self-motivation in your work. Prepare yourself for assumption of major responsibility.
5. Explore the possibility of being involved in a research project with a faculty member and/or other residents.

ROTATION MEDICAL EXAMINER'S OFFICE (4 MONTHS)

GOALS

A. To learn and utilize the skills necessary to perform a complete autopsy procedure independently.

B. To understand the pathology observed at autopsy in the context of the circumstances of death and the clinical history.

C. To develop an understanding of forensic pathology and be able to accurately establish a cause and manner of death.

OBJECTIVES

Patient Care:

1. Review medical and investigative records to understand the circumstances surrounding a death including recognizing the relevant clinical concerns and/or questions to be answered by the autopsy.
2. Formulate a clear and concise report in a timely fashion, including provisional autopsy diagnoses (PAD) and final autopsy report.

   PGY 1: create PAD in conjunction with attending pathologist
   PGY 2-4: progressive independence in creation of PAD with review by pathologist

Medical Knowledge:

1. Formulate a comprehensive differential diagnosis and provide a plan for evaluating an apparent natural death.
2. Identify and distinguish between cause of death, manner of death and mechanism of death on each case.

   PGY-1: formulate differential diagnoses and COD/MOD with attending pathologist
   PGY2-4: progressive independence with review by pathologist

Practiced-based Learning and Improvement:

1. Be able to perform a complete autopsy using both the Virchow and Rokitansky methods of prosection including head, neck, chest, abdominal, and pelvic dissections with emphasis on appropriate cutaneous incisions, and safe and through dissection techniques.

   PGY-1: month 1; complete autopsy examination with attending pathologist and/or senior pathology resident. Progressive independence as warranted.
   PGY2-4: progressive independence with addition of non-natural deaths (trauma, etc) where appropriate.

2. Obtain specimens of body fluid or tissue using appropriate methodology for various serologic, metabolic, chemical, microbiologic, toxicologic, and subspecialty pathologic (e.g. neuropathology) testing.
3. Analyze post mortem histologic sections and recognize normal versus pathologic processes seen at the microscopic level, as appropriated for level of training.

   PGY-1: submit samples of all tissue, normal and disease for microscopic examination and identification of normal histology
   PGY2-4: case-specific histologic examination, progressive independence with special stains, etc.

Interpersonal and Communication Skills:

1. Apply observation skills and knowledge of normal weights and measures to assess presence of gross pathology at the time of autopsy examination and describe orally and in writing the disease processes discovered.

Professionalism:

1. Demonstrate respect, compassion, and integrity.
2. Maintain respect for decedents at all times.
3. Demonstrate a commitment to excellence and on-going professional development.

Systems-based Practice:

1. Understand the role of autopsy examination as tool for quality assurance in larger health care system (hospital) and importance of forensic autopsy in other arenas (insurance, legal, law enforcement).

DUTIES AND RESPONSIBILITIES

1. Attend morning meeting at the MEO at 8:30 AM daily (except for Neuropathology days). This is the conference where all cases for the day are discussed along with case assignment. If there are conflicts with the schedule, then the resident must inform the attending pathologist (the call schedule for the pathologists is located at the front desk).

2. PRIOR TO AUTOPSY

A. Review MEO case file or SUNY medical records PRIOR to performance of the autopsy. The resident should be prepared to discuss a differential diagnoses list with the attending pathologist concerning the potential cause of death and possible anatomic findings that will be encountered. Thought should be given as to any tests that need to be done prior to the incision (e.g. chest x-ray for pneumothorax, cerebrospinal fluid culture, etc). The resident should discuss these testing modalities with the attending pathologist.

B. For SUNY hospital cases, contact clinician prior to beginning autopsy to determine specific concerns and/or questions to be addressed at autopsy.

C. Read the safety manual and MSDS booklets available in the morgue and follow evacuation procedures.

3. DURING AUTOPSY

A. Write/draw a legible and detailed body diagram and description of autopsy findings. Include notations on cassette numbers and microscopic sections taken for histologic examination.

B. Apply safe autopsy techniques including wearing personal protective equipment with N95 masks or HEPA-filtered respirator, cut-proof gloves, observing universal precautions, immediately washing and reporting ANY body fluid exposure episode, following policy for post-exposure prophylaxis, and carefully handling chemicals.

C. Use photographic services to document pathologic findings.

D. The resident is expected to learn to and be able to independently eviscerate a body including removal of the brain and neck organs, to be able to collect post mortem blood, vitreous humor and urine for toxicology testing, and to have an understanding of additional special techniques used in specific autopsy cases. A list of required technical skills must be maintained and completion of skills will be verified by attending pathologists. (see attached Required Autopsy Technical Skills Checklist).

E. During rotations in the first year of training, residents are required to submit sections of all major organs for histologic examination.

4. AFTER AUTOPSY

A. *Preliminary Autopsy Diagnoses (PAD)- within 24 hours.* This form must be filled out following the completion of the autopsy and reviewed with the attending pathologist within 24 hours of the autopsy and then turned into the attending pathologist. Included on the PAD are the cause and manner of death. For SUNY cases, the PAD is in the Copath system and must be electronically signed by the attending pathologist within 24 hours. It is the responsibility of the resident to have it complete this form well before the 24 hours time limit so there is time for the pathologist to comment upon it before signing.

B. *Dictation/transcription of case – within 48 hours.* MEO cases are dictated using instructions found in the "RESIDENT" folder. SUNY cases can be typed or dictated and then submitted to the anatomic pathology transcriptionists. Templates for both MEO and SUNY cases are found in the "RESIDENT" folder. It is important to dictate/transcribe the autopsy report as soon as possible after completing the examination for the most accurate descriptions and/or should a part of the examination need completing, it can be done prior to the body being released to the funeral home.

C. *Review and editing report*. The resident must compare the typed report with the body diagram to ensure that the report is complete and correct. It is easy to forget descriptions of physical characteristics that are not a part of the standard template so do a careful comparison. Check all sentences for proper grammatical construction, punctuation, article usage and spelling. Evaluate the report for consistency between sections by cross-referencing the diagnoses with the organ systems with the microscopic findings.

D. *Microscopic Slides – Within 2 weeks.* It is the resident's primary responsibility to preview the microscopic slides on their cases prior to reviewing with the case pathologist. The autopsy rotation is also the time for new residents to learn normal histology and therefore sections of major organs are reviewed as described above. Microscopic descriptions can be typed separately or directly added to the autopsy report in a separate heading.

E. *Neuropathology – Within 4 weeks.* A neuropathology summary must be done in every case where the brain and/or spinal cord is saved for neuropathologic examination. If the resident is performing the autopsy and the brain is saved for this examination then the summary should be typed up at the same time as the autopsy report. Residents will be expected to complete these summaries on a weekly basis prior to brain cutting. The resident on the MEO rotation has the primary responsibility to ensure that these summaries are done even if it is not their case. A list will be provided weekly to the residents to indicate which brains will be examined that week. The resident must make every effort to attend the brain cutting with the neuropathologist. For MEO cases, brains can only be retained if permission has been obtained from the next of kin of the decedent. Additional responsibilities related to Neuropathology rotations is provided elsewhere

F. *Clinical Pathologic Correlation – Within 3 weeks***.** This must be written up for EVERY autopsy for which the resident has primary responsibility. It should consist of 1-2 well written paragraphs summarizing the pertinent details of the clinical history and their correlation with the pathology seen at the gross autopsy examination. One or two current references should be included. Although eMedicine and other such internet-based informational sources can be used as references, plagiarism will not be tolerated. Work will be evaluated for fundamental knowledge of pathologic disease processes, thoroughness, effort, and timeliness. For SUNY cases, the CPC is a part of the report. For MEO cases, the CPC should be printed up separately and turned into the case pathologist, but is not an official part of the case file.

5. PRIOR TO COMPLETION OF ROTATION

A. Keep a list of autopsies performed and turn into Dr. Stoppacher upon completion of each autopsy rotation. Keep a separate list for yourself throughout your residency as this will be required when you apply to take the certification examination by the American Board of Pathology.

B. The resident on rotation at the MEO is expected to prepare a short (10-15 min) presentation on a case-based pathologic process to the staff. Multimedia including overhead projection, slide projector, and power point are available for use in the main conference room. Keep this in mind and take photographs liberally during the rotation. Remember that the photographs are the permanent record of what was seen during the autopsy.

6. OTHER

A. *Forensic Didactic Lecture Series*. The forensic pathology material is presented in a 2-year didactic lecture schedule. All of the basics are repeated in the first lecture each year. The Forensic Pathology Examination, used as a review for upcoming In-Service Exams, is given near the beginning of the schedule, on an every other year basis. Lectures begin at 8 AM on Monday mornings and are scheduled through the Residency Training Office. They are held approximately monthly.

B. *Respect and Confidentiality*. No files or reports (written or electronic) may be removed from the MEO. All case material is strictly confidential. Residents must sign a confidentiality statement on an annual basis.

CURRICULUM

1. Mandatory orientation (1st rotation).

A. Universal precautions, personal protective equipment, and post-exposure prophylaxis
B. Morgue safety issues, chemical hazards, formalin spills & spill kits, MSDS sheets, safety manual, and showers and eye wash stations.
C. Fire alarms, evacuation procedure, and physical tour with walk through and egress.
D. Overview of autopsy reports, standard template, diagrams, physical external examination, organization of report, and mandatory PAD & CPC.
E. Review of case file material, access to MEO staff and physicians, resources including library, teaching slides, SUNY computer, and MEO network.
F. Confidentiality and respect for decedents.

2. Two-year series of one-hour didactic lectures covering topics in forensic pathology.

A. Cause and manner of death
B. Post mortem changes and time of death
C. Traumatic injuries
D. Blunt force injuries
E. Neurotrauma
F. Sharp force injuries
G. Asphyxia

H. Firearms
I. Pediatric / infant deaths
J. Motor vehicle accidents
K. Fire and electrocutions
L. Therapeutic complications
M. DNA and toxicology
N. Vitreous humor testing
O. Mass fatality incidents
P. Death certification

3. Daily morning briefing meetings with pathologic discussions of differential diagnoses and conclusions from prior day's cases

4. Case-based instruction and performance of required technical skills.
   A. Independent evisceration using Virchow and/or Rokitansky techniques (5)
   B. Removal of neck block including tongue (5)
   C. Removal of brain from scalp incision (5)
   D. Drawing blood and urine samples for toxicology testing (2)
   E. Drawing vitreous humor for toxicology testing (2)
   F. Additional techniques where relevant

EVALUATIONS

These are written electronically by Drs. Stoppacher, Rodriguez and Aljinovic at end of rotation according to standard SUNY format. Residents are assessed on their ability to perform the duties and responsibilities for the rotation. Most important is the assessment of the attending pathologist in determining the resident's ability to perform the autopsy based on their level of training and the resident's knowledge-base in anatomic pathology. Accordingly, residents will be evaluated on how well they meet the deadlines for PAD, autopsy reports, and CPCs as well as their dissection skills, and expanding pathologic knowledge base. Also critical is professionalism and the ability of a resident to take responsibility of the autopsy and report as though they are the signing pathologist. Preparedness will be judged by questions posed on cases assigned to them and their retrieval of information regarding specific disease processes identified at autopsy. Interpersonal and communication skills will be critiqued by how effectively they present information at morning meetings, discuss individual cases with their attendings, interact with MEO staff, and follow up communication with clinicians. Failure to follow policies and procedures will result in a decreased grade.

AUTOPSY GUIDELINES AND SAFETY ISSUES IN THE MORGUE

UNIVERSAL PRECAUTIONS

The exposure to blood and body fluids creates a potential infection hazard and therefore, universal precautions are employed. When participating in an autopsy examination, the appropriate personal protective equipment (PPE) must be used. This consists of scrubs, disposable gown, shoe covers, hair bonnet, N-96 mask, eye protection (face shield or goggles), and double gloving with a cut resistant glove interposed on the non-dominant hand. In some cases a battery-powered HEPA filter will also be used. Residents must be tested by SUNY Health and be familiar with N-95 mask fitting and how each should be worn. Any exposure to blood or body fluids must be immediately cleansed and then reported to the attending on service and the pathology residency director. It is important to consider your response to an exposure BEFORE it happens. Factors to consider include decedent risk factors for HIV and hepatitis, your personal health status and the nature of the exposure. A post-exposure protocol is in place at the medical examiners office and related testing and prophylactic medications are available.

AUTOPSY GUIDELINES

1. Respect the decedent and maintain a respectful attitude in the morgue and concerning the investigation.
2. Remember to maintain the confidentiality of the information learned during the investigation and autopsy.
3. Always eat a meal (breakfast or lunch) before working in the morgue. Stay hydrated and drink plenty of fluids before observing. Failure to comply will result in NOT being allowed to participate.
4. If you have a medical condition and/or require special medication, please notify the pathologist PRIOR to the autopsy. Keep your medication on hand in the pocket of your scrubs.
5. Follow standard operating procedures for wearing personal protective gear and following universal precautions. Be aware of the post-exposure prophylaxis protocol.
6. If you feel hot, dizzy, light-headed, nauseated, sweaty, ill, or have a medical condition causing you symptoms, sit down immediately. Call to the nearest personnel and notify them of your problem.
7. If you suffer an illness or injury, there are medical personnel on site who can help assess the severity and you may be advised to go to student health, the emergency room, your personal physician, or have emergency medical personnel transport you.
8. Never reach into the field of dissection if you are assisting. Remember sharp instruments are being used. Never point into the field of dissection. Be aware of the location of sharps at ALL times. NEVER re-cap a needle. Remove scalpel blades with clamps NOT your hands.
9. Do not attempt to move a decedent by yourself. Ask for assistance. Know proper lifting techniques.
10. Ask the pathologist before proceeding to the internal portion of the examination. Ask the pathologist or technician for assistance before proceeding with anything with which you are not comfortable or familiar. Notify the pathologist with any free blood or fluid within body cavities or head before proceeding. Know the method for collection of body fluids for toxicology for every case.
11. **If there is a blood or body fluid exposure, follow standard operating procedure # 613. Emergency eyewash stations and showers are available in each autopsy suite. A post-exposure medication prophylaxis kit is available on site.**
12. If any alarms sound, confer with the technician as to the source and the appropriate course of action. In all circumstances, your safety comes first. Follow standard operating procedure #615 for emergency evacuation.
13. Know the locations of the fire extinguishers, emergency exits, formalin spill kits, and dial 9-9-911 for emergencies.
14. NEVER mix bleach and formalin or allow them to come into contact – a poisonous gas is formed.
15. Residents are expected to be responsible physicians who will bring any problems or concerns to the immediate attention of the attending pathologist and Chief Medical Examiner in a timely fashion.
16. Residents must coordinate with the Chief Resident and/or the Director of Residency Training for any conflicts in schedule that occur during the autopsy rotation. This includes coverage for time off and/or vacation.
17. Autopsy examinations are also performed at the VA hospital and Crouse Hospital under the direction of related attending pathologists. As these cases are less frequent, they will take precedent over MEO cases on that day. Similarly, as Neuropathology conference/brain cutting is currently limited to one half-day per week, the residents' primary responsibility on those days is to take part in the Neuropathology conference.

REQUIRED AUTOPSY TECHNICAL SKILLS CHECKLIST

Independent Evisceration (5 required)	DATE	VERIFIED
1.		
2.		
3.		
4.		
5.		

Removal of Neck Organs (5 required)	DATE	VERIFIED
1.		
2.		
3.		
4.		
5.		

Scalp and Skull incisions (5 required)	DATE	VERIFIED
1.		
2.		
3.		
4.		
5.		

Draw blood specimens for Toxicology (2 required)	DATE	VERIFIED
1.		
2.		

Draw vitreous humor and urine (2 required)	DATE	VERIFIED
1.		
2.		

Additional special techniques (optional)	DATE	VERIFIED
1.		
2.		
3.		

Resident: **Months on Rotation:**

Please list all cases for which you had primary responsibility including transcription during your rotation at the Medical Examiner's Office. Complete as many sheets as necessary.

Case#	Sex	Age	COD and MOD	Attending	Autopsy or External	Date of Exam

Total Cases: _____

RESIDENT signature: _____

CHIEF MEDICAL EXAMINER signature: _____

Below is an example of a neuropathology (NP) summary sheet, followed by a blank sheet for you to utilize as a template.

Each Monday the autopsy techs should bring a list of NP cases from the MEO that will be examined on Thursday morning. If the techs have not brought the resident the list by Monday morning, then please ask them for the list.

The resident is responsible for getting the case file, and gross autopsy findings; then reviewing these, and typing up a summary sheet for each case. Once completed, the sheet must be reviewed and signed by whichever attending covered the autopsy.

In addition to basic information, such as name, case #, brain weight, DOB, and TOD, the summary should have three basic pieces of information. The first is the case history, the second is a review of autopsy findings, and the third is our reasoning for requesting a NP consult.

JOE SMITH **CASE FILE # M10-9999**

SUMMARY FOR NEUROPATHOLOGY:

DATE OF BIRTH: 01/01/86
DATE OF DEATH: 02/19/02
DATE OF AUTOPSY: 02/20/02
BRAIN WEIGHT: 1260 grams

Brief clinical history including past medical history.
Brief summary of circumstances surrounding the death.

The autopsy revealed…….(*describe significant autopsy findings*).

A neuropathology examination is being requested to……..(*specific question to be answered by neuropathology exam)*.

_____

Robert Stoppacher, MD
Chief Medical Examiner

NAME **CASE FILE #**

SUMMARY FOR NEUROPATHOLOGY:

DATE OF BIRTH:
DATE OF DEATH:
DATE OF AUTOPSY:
BRAIN WEIGHT: grams

SCENE AND CIRCUMSTANCES:
RELEVANT CLINICAL HISTORY:
AUTOPSY FINDINGS:
SPECIFIC NEUROPATH QUESTIONS:

_____

, MD

Medical Examiner

MEO CASE# ??-???? **DATE: MM/DD/YYYY**

This form must be completed after the completion of the autopsy and reviewed with the attending case pathologist.

PROVISIONAL ANATOMIC DIAGNOSIS

1. ....
2. ....
3. ....
4. .....

CAUSE OF DEATH

.....
due to .....
due to .....

MANNER OF DEATH

.....

RESIDENT:

PATHOLOGIST:

RESIDENT DICTATION & AUTOPSY REPORT INSTRUCTIONS

Dictating to Spectramedi - Please see the phone-in instructions below. I have also attached the template that the company will use to type your dictation. Please **DELETE** any old templates you have on the computer or on CD!

Please spell patient's first and last name, and give the date of service on each dictation.

Telephone Dictation Instructions

- Dial the access phone number : 315-701-1850
- Wait for voice prompt
- Key-in User-Id (followed by #) : 4373
- Key-in PIN (followed by #) : 8025

Recording will begin after the voice prompt.
PLEASE NOTE: Each dictation is a separate job.
Please start each dictation as a new file/record.

Dictate the name of the ME doctor assigned to the case at the beginning of your dictation!

On the phone keypad

Press **1:** **PAUSE**
2: **RECORD** (you will hear only a beep)
3: **BRIEF REVIEW** (press several times for long review)
4: **BRIEF ADVANCE** (press several times for longer advance)
5: **INSERT** (remaining portion of the dictation will get appended after the inserted portion)
6: **REPLACE** (remaining portion will be over-written and balance, if any, will be deleted)
7: **GO TO BEGINNING** of the dictation and play
8: **SAVE** the current dictation
9: **CANCEL** the current dictation (The system will ask for confirmation)
* **HANG-UP** (not necessary)

Disconnecting, without pressing 8, will automatically save the dictation as a normal job.

Pressing **8** will access the **SAVE** menu, with the following save options:

- **press 2**: saves the current dictation as a normal job and start a new dictation

Reports are usually completed within four days of dictation (not including holidays and weekends). You will login to the Spectramedi website to view your MS Word autopsy report and save it to a file for corrections. You must also submit a copy of your case list weekly to Elaine Spaulding either by hard copy or via zixsecure. **Skip to #4 if you decide to type your own reports.**

To access Spectramedi reports and submit reports to MEO:

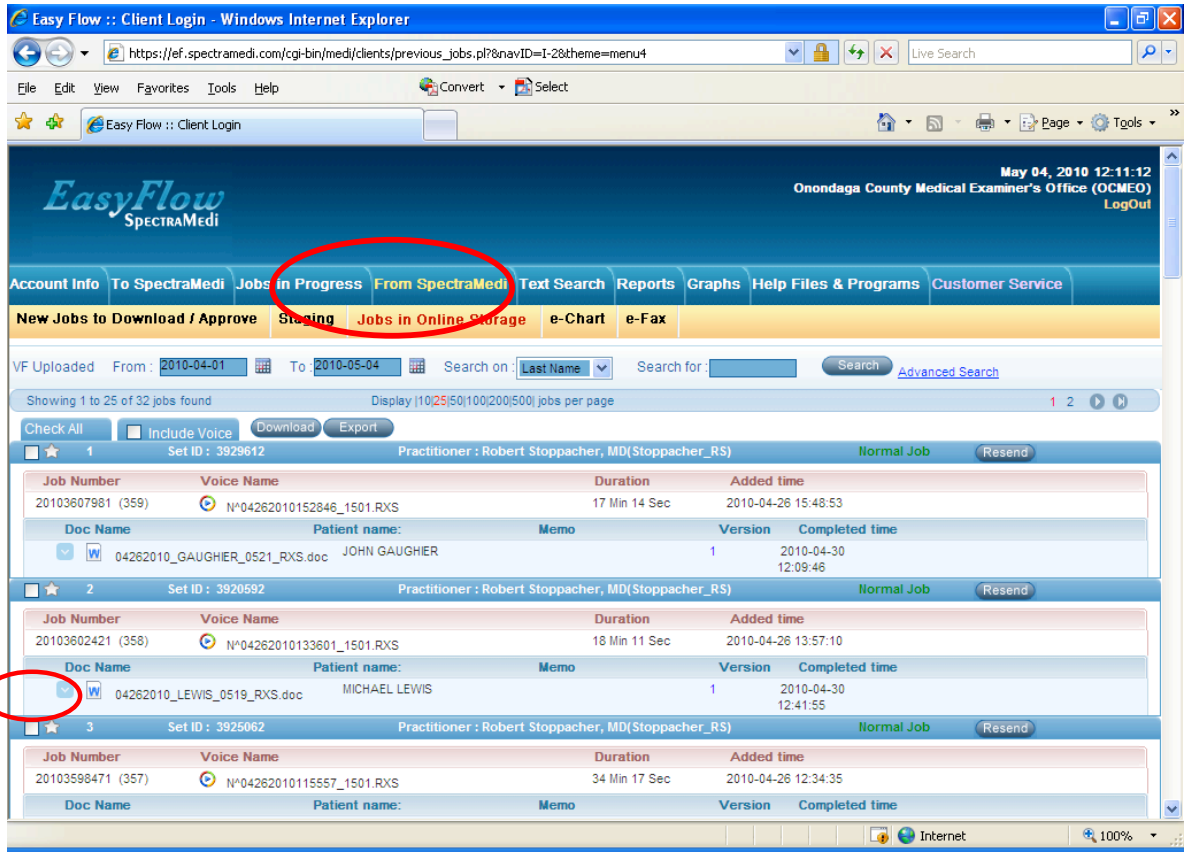
1. Login to SpectraMedi Easy Flow using the following link and save in your favorites: https://ef.spectramedi.com/cgi-bin/medi/perl.pl *Username* - OCMEO, *Password* - JK38Y8L9

2. Click on **From SpectraMedi**, then **Jobs in Online Storage.** Select a date range and Search on **Last Name**. Click SEARCH. Look for your case - the filename includes the decedent name, case number and .RSD at the end for resident.

3. **Click on the "W"** in front of the filename to open the Word document. Save it to a folder to work on.

4. Email the **corrected report** via **zixsecure**.

5. The **Body Sheet** must be turned into the mailbox of the medical examiner assigned to the case **as soon as you are done with report corrections.**

6. 

DEPARTMENT OF PATHOLOGY
ROBERT J. CORONA, DO, MBA, CHAIRMAN
PHONE: (315) 464-4750 FAX: (315) 464-7130
AUTOPSY REPORT

NAME: _____ AUTOPSY NO.: _____
UH#: _____ AGE/SEX: 78Y M
PAT#: _____ PERMIT OBTAINED BY:
SERVICE: ___
ATTENDING: _____ , MD PROSECTOR: _____, MD
PATIENT CARE UNIT: ___ ASSISTANT: _____
DATE & TIME OF DEATH: _____
DATE & TIME OF AUTOPSY: _____
DATE OF REPORT: _____
FINAL AUTOPSY DIAGNOSES:
1.
2.
3.
4 etc.…

EXTERNAL EXAMINATION:
The body is that of a thin/obese/adequately nourished/cachectic/emaciated, adult Caucasian/Black/Asian male/female who weighs ** pounds, measures ** inches in length, and appears consistent with/older than/younger than the stated age. The body mass index is ** kg/m^2. The refrigerated, unembalmed body is [centrally warm/cool/cold] to the touch. Rigor mortis is [*well-established/moderate/slight*] in the jaw and in the small and large joints of the upper and lower extremities. [*Fixed/unfixed, color*] lividity is over the [*posterior/anterior/left or right lateral*] surfaces of the body, except in areas exposed to pressure.

The **(color)* scalp hair measures ** cm. The irides are **(color)* and the pupils are round and equal. The corneae are transparent. The sclerae are **(white/congested/icteric/show tache noire)* and the conjunctivae are clear. No petechial hemorrhages are on the sclerae, bulbar conjunctivae, facial skin, or oral mucosa. The nose is without deviation from the midline. The ears are normally developed and are free of acute traumatic injuries AND/OR with * remote piercings of the right/left/each earlobe. (*IF male*): The decedent is clean-shaven OR *(describe facial hair)*. The natural teeth are in *[poor/adequate/good]* condition. OR The mouth is edentulous with/without dentures in place. The frenula are intact and the labial mucosa shows no injuries. The neck is symmetrical and the trachea is in the midline. The chest is symmetrical with *[a/an normal/increased*] anteroposterior dimension. The breasts [*IF FEMALE*] have no palpable masses or skin ulcers. The abdomen is [*scaphoid/flat/rounded/protuberant/obese*].

The external genitalia are of a normal adult male/female and are without injury. [*IF MALE*]: The testes are palpated within the scrotal sac. The extremities are normally developed and symmetrical. **Describe fingernails/toenails. Describe pedal edema, decreased hair growth on legs, venous stasis changes, etc if present.* The pedal surfaces are unremarkable. The back and buttocks are unremarkable, and there is no blood or stool at the anus. *Describe hemorrhoids if present.*

EVIDENCE OF MEDICAL THERAPY:
The following medical and therapeutic devices and/or marks are present and appropriately placed on the body:
1.
2.
3.
4.

EVIDENCE OF INJURY:
[ALL INJURIES, EXTERNAL AND INTERNAL, ARE DESCRIBED IN THIS SECTION, INCLUDING CPR-RELATED]

HEAD AND NECK:

CHEST AND ABDOMEN:

UPPER EXTREMITIES:

LOWER EXTREMITIES: *[DELETE IF NO INJURIES PRESENT]*
INTERNAL EXAMINATION:

BODY CAVITIES: All major internal organs are in their normal anatomic position with the usual relationships. The abdominal subcutaneous fat measures *** cm, at the level of the umbilicus. No adhesions or abnormal collections of fluid are in any of the body cavities. OR *Describe adhesions (location/quantity/fibrous or fibrinous) OR fluid (quantity/color/turbidity).*

CARDIOVASCULAR SYSTEM: The heart weighs * grams. The pericardial surfaces are smooth and glistening without adhesions. The pericardial sac contains a small amount of straw-colored fluid. The epicardial surface is [*unremarkable/shows petechiae/shows white fibrous plaque/etc*]. The coronary arteries arise normally from patent ostia situated within the sinotubular junction, are of normal caliber, and pursue a right/left/co-dominant course. The coronary arteries show [*no/minimal/mild/moderate/severe*] atherosclerosis in a [*focal/patchy/diffuse*] distribution. The [*left anterior descending/left circumflex/right coronary*] artery shows __% luminal stenosis of the [*proximal/distal/mid-segment*]. [*Describe all 3 major vessels].* No thrombosis, plaque hemorrhage, or dissection is present. The myocardium is red-brown and firm, without pallor, hyperemia, or fibrosis. The left ventricular free wall measures ** cm at a level approximately 2 cm inferior to the atrioventricular valve annulus; the right ventricular wall measures ** cm, and the interventricular septum measures ** cm in thickness. The atrial and ventricular septa are intact. The endocardial surfaces are smooth and glistening. The cardiac chambers are not dilated OR [*describe dilation of the ventricles or atria specifically]*. The cardiac valves are in the usual anatomic positions and are without calcifications or vegetations, with the following measured circumferences: tricuspid = * cm; pulmonic = * cm; mitral = * cm; and aortic valve = * cm. The great vessels arise normally. The aorta has a normal course and caliber, and shows [*no/mild/moderate/severe*] atherosclerosis.

RESPIRATORY SYSTEM: The right and left lungs weigh * and * grams respectively. The pleural surfaces are smooth and glistening, with *minimal/moderate/marked* anthracotic discoloration. The tracheobronchial tree is non-obstructed, and free of foreign material [*describe froth or fluid if present*]. The pulmonary parenchyma is [color/consistency/consolidation/emphysematous change], exuding [mild/moderate/copious] amounts of [blood] and [mild/moderate/copious] amounts of [frothy fluid]. The parenchyma is without focal lesions [*or describe if present*]. There is no saddle embolus on in situ examination of the pulmonary trunk. The pulmonary arteries are patent and without thromboemboli.

HEPATOBILIARY SYSTEM: The liver weighs * grams. The capsule is smooth, glistening and intact. The hepatic parenchyma is [*color: red-brown, yellow-brown*] and [*congested with a nutmeg appearance*], without focal lesions or gross fibrosis. The gallbladder contains [*color*] bile *with/without* calculi [*size/shape/color/number*]. The extrahepatic bile ducts are patent and free of calculi.

RETICULOENDOTHELIAL SYSTEM: The spleen weighs * grams. It has a smooth gray surface, and [*firm/soft/diffluent*], dark red-purple parenchyma with *discernible/indiscernible* lymphoid follicles. There is no generalized or regional lymphadenopathy. [*Describe thymus if present.*]

GENITOURINARY SYSTEM: The right and left kidneys weigh * and * grams, respectively. The capsules strip easily. The cortical surfaces are [*smooth/mildly OR moderately granular/pitted*] and [*red-brown/pale brown*]. The cortex and medulla are well-demarcated, and without focal lesions. The calyces, pelves, and ureters are without lesion. The urinary bladder contains ** mL of urine, and the mucosa is gray-tan and [*smooth/trabecular/shows focal hemorrhage*]. The prostate gland is [*describe size/color/cut surface*]. OR The uterus, fallopian tubes and ovaries are [*present/absent*] and [*describe*].

GASTROINTESTINAL SYSTEM: The esophagus is lined by gray-white mucosa, without varices, tears, or ulcerations. The gastric mucosa is [*autolyzed OR arranged in the usual rugal folds*], without ulceration, hemorrhage, or focal lesions. The stomach contains ** mL of [*describe color/consistency/fluid or partially-digested food*] without recognizable foreign objects or pills. The small and large intestines demonstrate a normal course and caliber and are without lesion. The vermiform appendix is *present/absent*. The pancreas is lobulated, [*color, texture*], *with/without* autolytic changes AND/OR *with/without* focal lesions.

ENDOCRINE SYSTEM: The thyroid gland is [*describe size, color and consistency*]. The adrenal glands demonstrate an orange-yellow cortex which is clearly demarcated from the underlying, [*soft/firm/autolyzed*] red-brown medulla. No hemorrhage or masses are evident in the adrenal glands.

CENTRAL NERVOUS SYSTEM: The brain weighs * grams. There is no subscalpular or subgaleal hemorrhage. The skull is intact and without fractures. The dura mater is intact and there is no hemorrhage in the epidural, subdural or subarachnoid locations. The brain is saved for formal Neuropathology examination.

NECK: Examination of the soft tissues of the anterior neck reveals the strap musculature and sternocleidomastoid muscles to be free of hemorrhage. The hyoid bone and the larynx are intact and without hemorrhage. The larynx at the level of the vocal cords is patent, and free of lesions. There is no exudate or edema of the epiglottis. The tongue shows no hemorrhage on sectioning.

MUSCULOSKELETAL SYSTEM: The bony framework, supporting musculature, and soft tissues are unremarkable. There are no acute fractures. The vertebral column is intact and without significant kyphosis, scoliosis, or osteoarthritic/osteoporotic changes. The cervical spinal column is stable on internal palpation. The anterior paravertebral musculature and prevertebral fascia are without hemorrhage.

MICROSCOPIC DESCRIPTION:
A1: [*LIST TISSUE IN CASSETTE*]
A2:
A3:
A4:
A5:
[*DESCRIBE EACH ORGAN SEPARATELY, NOT BY SLIDE*]
HEART:
LUNGS:
LIVER:
KIDNEY:
BRAIN:

FINAL AUTOPSY SUMMARY: **Includes the clinicopathologic correlation which is a written description of major gross and microscopic findings and how these findings correlate with the patient's hospital course, clinical findings or suspicions and past medical history. This is also where any discrepancies between clinical and autopsy findings are discussed.**

It should also include a brief discussion on a particular aspect of the patients pathologic disease process with references as needed.

_____ , MD 07/03/17 _____ , MD 07/03/17
Prosector Date Attending Physician Date

PRELIMINARY AUTOPSY DIAGNOSES:

I. Most significant major disease process
   A. First associated condition
      1. Related findings

2. Related findings
    a. Consequences of IA2 above
    b. Consequences of IA2 above, etc.
B. Second associated condition
C. Third associated condition

II. Next most significant disease process
III. Next most significant disease process
etc…….

PRELIMINARY AUTOPSY SUMMARY:

First paragraph should be brief summary (2-3 sentences) of medical history, reason for hospital admission, and hospital course.

Second paragraph should be written summary of major autopsy findings that includes answers to clinical questions to be addressed during autopsy. Also should include what tests or other studies are pending and/or to be completed to establish final diagnoses.

CYTOPATHOLOGY

Length of rotation: 3-month mandatory rotation.

Teaching Faculty:
Kamal K. Khurana, MD – Director
Rana Naous, MD
Ola El-Zammar, MD
Qun Wang, MD

Rotation Goals

The main goal of this rotation is to provide residents with the necessary tools to deal effectively with most cytopathology cases encountered in a general pathology practice. This rotation will also serve as a basic foundation for those interested in pursuing cytopathology as a subspecialty.

Rotation Objectives:

Acquire a base of knowledge, skills, experience and understanding of cytopathology.

1. Attain competency in practice of cytopathology through exposure to routine screening of gynecological specimens and processing, and interpreting cytologic material from various sites

2. Acquire skills, knowledge and understanding of the administrative and operational issues of a cytopathology laboratory, including policies and procedures, regulations, quality assurance, and quality improvement.

Resident would achieve these objectives by becoming familiar and competent in the following:

1. Screening of routine PAP smears, diagnosis and classification of abnormal PAP smears, systems of reporting (Bethesda and others).

2. Non-gyn specimens, including body fluids, brush cytology, fine needle aspirations, etc.

3. Collection and preparation of specimens for cytology evaluation including attendance in radiology suite to observe FNA's and attendance in cytology preparation room. In addition, residents will interact with surgery to perform FNA's in the clinic. The resident must document this experience in their file.

4. Preview and obtain a clinical history, previous material on all cases to be signed out by the pathologist. Be prepared to support and discuss diagnoses by appropriate research/reading.

5. Review study sets in both gyn and non-gyn materials (e.g. departmental, ASCP, Checkpath). Review unknowns with a supervisor.

6. Participation in quality control and quality assurance.

7. Administrative and management issues and subsequent activities pertaining to cytopathology lab.

8. The resident will develop the necessary skills to become competent in making clinical/pathologic correlation.

9. The resident will prepare for sign out with the attending pathologist by having analyzed the materials to the best of her/his ability and a diagnosis written on the requisition sheet. The resident should be prepared to discuss and support their diagnoses with supporting documentation from texts and the literature.

The requirements and expectations as well as opportunities will be reviewed with each resident during their first few days. Self-study is a significant component of the rotation and will be followed up by staff.

The University Hospital requires residents to be credentialed for fine needle aspiration biopsies (FNAB's). For residents, these have been set at 5 superficial FNABs. Obtaining these credentials by no means indicates expertise in this technique! A resident will be credited per case if they are actively involved and perform as directed; a resident will be credentialed after 5 documented cases and the approval of the Medical Director.

Three month rotation is mandatory. Elective rotation for additional months is also allowed. Greater than three month increments need prior approval of the Director of Cytopathology. Due to the fellowship program, only 1 resident position is available per month; exceptions must be cleared through the Director of Cytopathology. The amount of time allowed off service for vacation/comp time is dependent on the length of the rotation as indicated below. Consideration will be given to residents participating in meetings.

Curriculum:
Test performed:
Gynecological Cytopathology: Pap smears

Non-gynecological cytopathology: Body fluid cytology including Pleural fluid, Peritoneal fluid , CSF, synovial fluid, sputum, bronchial lavage and washings

Fine Needle Aspiration: Superficial FNA performed by pathologists and residents. Deep seated FNA performed by radiologist and clinicians. FNA performance (superficial only) Onsite evaluation, adequacy assessment and preliminary diagnosis are important component of FNA service.

Cytopathology Conferences: will be given at least 2-3 times per month. Attendance is required and participation is expected. Teleconferences, guest speakers and informal discussions are optional but encouraged. These will include didactic lectures as well as unknown cytology slide conferences given by cytopathology faculty and fellow.

Recommended Reading List

1. Comprehensive Cytopathology edited by Marluce Bibbo, MD
2. Practical Cytopathology edited by Robert W. Astarita, MD
3. Fine Needle Aspiration Cytology edited by Leopold Koss, MD
4. Fine Needle Aspiration of the Breast by Tilde Kline
5. The Art and Science of Cytopathology by Richard DeMay, MD

Duties and Responsibilities

Increment - 1 month

The resident will be responsible for attending daily sign-out and, after the first week, will be responsible for Previewing cases in graduated increments.

Residents may attend *for observation only* the weekly Cytopath FNAB Clinic in room 4800 University Hospital. Residents will spend at least two sessions in the preparatory area learning techniques.

There will be reading and study packets assigned by topic with follow up by staff. The first 1-month increment will emphasize gynecologic cytopathology.

Note: Vacation/comp days must be approved by the Director and will be limited to 2 days under normal circumstances.

Increment - 2 month

The resident will be responsible for attending daily sign out and, after the first week, will be responsible for previewing cases in graduated increments. The resident will then begin to work up non-gyn cases for sign out. Preparatory sessions (2) will be assigned during the first month.

The resident *may be given* the opportunity to learn the technique of FNAB. This may occur within the first month at the discretion of the Director; if not, then during the second month. If the resident performs adequately following instruction then he/she will be allowed to continue with interaction in the interventional services. The resident will also attend several radiologic guided procedures with the Cytopathology fellow or Cytotechnologists. If performance and progress is satisfactory then the resident will be allowed to perform independent of staff following residents being credentialed.

There will be reading and study packets assigned by topics will follow-up by staff. The emphasis will be mixed, both gyn and non-gyn throughout the two-month cycle. The resident will be expected to attend 2 cytopathology conferences presented by attending or fellow one every 3rd week.

Note: Vacation/comp days must be approved by the Director and will be limited to no more than 1 week (5 working days) under normal circumstances.

Increment - 3 month - *rotation can be tailored for senior residents with specific requests.*

The resident will be responsible for attending daily sign out and after the first week will be responsible for previewing cases in graduated increments, including the responsibility for writing up non-gyn (FNAB) cases.

The resident *may be given* the opportunity to learn the technique of FNAB. This may occur within the first month at the discretion of the Director; if not, then during the second month. If the resident performs adequately following instruction then he/she will be allowed to continue with interaction in the interventional services. The resident will also attend several radiologic guided procedures with the Cytopathology fellow or Cytotechnologists. If performance and progress is satisfactory the resident will be given the opportunity *for independent assessment* of cases prior to final sign-out by the attending.

There will be reading and study packets assigned by topics will follow-up by staff. The emphasis will be mixed, both gyn and non-gyn throughout the three-month cycle. The resident will present 3 cytopathology conferences -they can choose topic and style.

Note: Vacation/comp days must be approved by the Director and will be limited to no more than 2 weeks (10 working days) under normal circumstances.

1st-4th year residents

If residents participate in primary screening of cytology cases, these cases will be rescreened by the cytopathology fellow, a cytotechnologist, or a pathologist prior to reporting.

Method of Evaluation

Residents must develop competencies in the six areas below to the level expected of a new practitioner.

Patient Care

Residents must demonstrate a satisfactory level of cytologic diagnostic competence and the ability to provide appropriate and effective consultation in the context of cytopathology services.

Medical Knowledge

Residents knowledge will be assessed based on his/her work-up of cases for sign out. Ability to establish clinicopathologic correlation based on cytologic diagnosis will be assessed. Participation in cytopathology conferences will be evaluated by program director and attending staff.

Practice-based learning and improvement

Resident must be able to perform literature search, collect appropriate background information and read text material pertaining to a cytology case that they are working up.

Interpersonal and communication skills

Will be assessed based on residents interaction with the attending staff, cytotechnology staff, peers and physicians from other departments. Ability to communicate cytologic diagnosis and to address the concern of attending physicians about individual cases will be assessed.

Professionalism

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

Systems based practice

Familiarization with system of Health Care and ability to call on system resources as needed to provide pathology services of optimal value will be assessed.

SURGICAL PATHOLOGY ROTATION AT UNIVERSITY HOSPITAL DOWNTOWN

Length of Rotation: 12 months required over a period of 4 years of residency.

Teaching Staff:
Christopher Curtiss, MD
Gustavo de la Roza, MD
Ola El-Zammar, MD
Joseph Fullmer, MD, PhD
Rana Naous, MD
Alfredo L. Valente, MD
Shengle Zhang, MD
Qun Wang, MD
Kerry Whiting, MD

Goals
The goal of this rotation is for the resident to develop into a proficient surgical pathologist with strong skills in gross and microscopic diagnosis and the knowledge and ability to utilize ancillary immunohistochemical and molecular techniques as well as current literature in formulating diagnoses.

Objectives
- To recognize gross abnormalities in various specimens and take appropriate sections to demonstrate both abnormal lesions and their relationship to surgical margins.
- To synthesize information from current literature and textbooks and use it in establishing diagnoses.
- To utilize current immunohistochemistry and molecular techniques to formulate diagnoses.
- To clearly and concisely convey to clinicians both the diagnosis and its implications for treatment and prognosis.
- To diagnose benign and malignant neoplasms as well as non-neoplastic disorders from a wide varieties of sites.
- To formulate a surgical pathology report containing an organized and well-written gross description, a pertinent microscopic description where indicated, and a concise, straightforward, and comprehensible diagnosis.

Curriculum
ORGANIZATION OF THE SERVICE UH DOWNTOWN:

The surgical pathology service is divided into a ***Biopsy Service (GI and Non-GI)*** and ***Routine & Frozen Section Service*** covered by4 attending (faculty) pathologists, 2-3 residents and 2 pathologist's assistants (PA) Residents are not assigned to the biopsy services until their second year (PGY-2).

- ***Non GI-Biopsy*** cases include small biopsy specimens (endocervical/endometrial currettings, cervical biopsies, , transbronchial/endobronchial biopsies, needle biopsies, etc.), larger biopsies (incisional breast biopsies, lung wedge biopsies, lymph node biopsies, etc.) as well as cases with frozen sections in which there are no additional large specimens.

GI Biopsy cases include esophageal, gastric and intestinal biopsies

- ***Routine*** cases include all other cases in which there is no urgency for diagnosis or in which there are a large number of specimens and/or margin assessment is needed. ***Use judgment in***

determining what are biopsy and what are routine cases. For example, a breast lumpectomy following a prior diagnostic core biopsy is a routine. Most specimens requiring margins are routines. ***If there are any questions ask an attending.***

- ***Neurosurgical specimens*** include biopsies performed by neurosurgeons on brain or spinal cord. They are handled like ordinary biopsy specimens except that they are signed out by the neuropathology attending.

Some biopsy slides are available in the afternoon on the day they are grossed (microwave processed cases), and the resident is expected to review them that afternoon or evening. Special stains on these cases should be ordered in the afternoon (with the approval of the attending pathologist) so that they will be available the next morning. The remaining biopsy cases are usually available from the lab at about 8 AM the morning after they are grossed, and the biopsy resident is expected to review them before signing out with the attending, usually starting by 10-10.30 AM. .

The routine slides are available before noon, and the routine resident has the rest of the day (between frozen sections) to review them and prepare for sign-out the next day. Sign-out must start early, latest 9 AM, so that the resident can finish and begin cutting in specimens in the gross room by 1 PM latest. Some routines can be signed out on the day after grossing if there is time. ***Residents must preview all their cases and have a written formal diagnosis prepared prior to sign-out with the attending***.

SAMPLE SCHEDULE

	ROUTINE	FROZEN SECTION	NON-GI BIOPSY	GI BIOPSY
Monday	Resident A	Resident B	Resident C	Resident D
Tuesday	Resident B	Resident A	Resident C	Resident D
Wednesday	Resident A	Resident B	Resident C	Resident D
Thursday	Resident B	Resident A	Resident C	Resident D
Friday	Resident A	Resident B	Resident C	Resident D
Monday	Resident C	Resident A	Resident D	Resident B
Tuesday	Resident A	Resident C	Resident D	Resident B
Wednesday	Resident C	Resident A	Resident D	Resident B
Thursday	Resident A	Resident C	Resident D	Resident B
Friday	Resident C	Resident A	Resident D	Resident B

NOTE: The resident follows their cases, although attendings may switch weekly. That is, resident B who cut in routines on Thursday of the first week will sign out those routines the next Monday morning (with the attending assigned routines that week) even though he/she switches to biopsies that week. Resident C will sign out Friday biopsies on Monday morning even though he/she switches back to routines that week.

SURGICAL PATHOLOGY ROTATION FOR RESIDENTS

GROSS ROOM

General:

1. Residents on the Routine Service should plan to start grossing their cases by 1:00 PM, and residents on the Biopsy Service by 2:00.

2. Residents should plan routinely to be finished grossing by 6:00. Both residents (the routine service and the biopsy resident) who are scheduled to gross in on a given day should work together to complete the work. *Neither resident should leave the gross room until all work is completed*. If there is an unusually large load, the resident on frozen sections should also help finish the cases in the late afternoon.

3. Residents must ***show all cases that require sectioning*** to the responsible attending pathologist. This requirement may be relaxed or dropped on an individual basis depending on the resident's level of training and the attending pathologist's assessment of the resident's ability and competence.

4. Residents must ***follow instructions in Gross Room Manual*** for all cases. Specific requests by the attending pathologist should be done in addition to, but not instead of, manual instructions.

5. Residents need to be sure that cases designated as **biopsies** or **routines** are correctly categorized. Biopsies include all specimens that need to be diagnosed the next day, while routines are either larger specimens that already have a diagnosis, or small cases in which there is no rush for diagnosis. If you have questions about a particular case, ***ask your attending***.

6. In order to be successful, residents need to be ***organized, neat, and compulsive***. The most common problems in the gross room include mixing up specimens (placing the tissue in the wrong cassette), carrying tissue from one specimen to another (by not rinsing instruments between cases or not cleaning cutting area between cases), misplacing specimens (not keeping track of the specimens listed on the requisition), and failing to sample the lesion (careless gross examination).

7. Residents are responsible for making sure that the number of blocks utilized in each case is correctly entered in the computer, and they are responsible for ordering additional cassettes when needed. This will be explained to the residents during their first week on the service by the PA or senior residents.

Gross Examination:

1. Make sure that the name on the container matches the name on the requisition form and that the number on the cassette is the one that has been assigned to that case.

2. Make sure that all containers listed on the requisition sheet are accounted for, and that the container labels ("A", "B", "C", etc.) correspond with similar labels on the requisition sheets.

3. Have an ***organized approach*** to gross examination. First, ***document*** what is received and ***measure.***

4. ***Orient the specimen*** and identify all normal structures. Always carefully examine the outer surface before opening or sectioning the specimen.

5. Determine whether and what margins are important. ***Think before cutting the specimen***, in order to keep orientation, determine relationships, and evaluate margins, etc.

6. Small specimens (prostates, breast biopsies/lumpectomies, thyroid lobes, etc) can be painted with ink to mark margins. ***Do not ink*** entire surface of large specimens (nephrectomies, mastectomies, soft tissue tumors, etc). Rather, just ink the area from which the section is taken.

7. Open or section the specimen and describe appearance. Be sure to document the size and appearance of any abnormality. If tumor is present, measure distance from margins.

8. When multiple (>10) small tissue fragments are received (disc, prostate TURP's, bone fragments, etc.) give the ***range of size as well as an aggregate measurement*** ("Multiple yellow white tissue fragments are received ranging from 0.5 to 3.0 cm in maximum dimension and aggregating to 6.0 x 1.5 x 1.0 cm"). Biopsy templates are posted at each grossing station.

   Note: If less than (approximately) 10 tissue fragments are received, the number (and approximate size of each or range) should be accurately recorded. This is especially important for prostate biopsies, breast cores, and G-I biopsies and can be helpful in sorting out mislabeled or otherwise mixed up blocks.

9. For tiny biopsy specimens (such as cervical biopsies, GI biopsies, etc) that are less than .5 cm it is sufficient to state the single maximum dimension rather than noting all three dimensions.

10. For thin needle biopsy specimens (especially prostate biopsies), you must ***disentangle each core*** and line them up separately on moistened blue lens paper. If you do not separate them, they will be permanently tangled, as the lab cannot separate them after they are processed, and histologic examination will be compromised.

11. Carefully choose where to take sections and how many to take. It is expensive and time consuming to process tissue for slides, it is time consuming and tiring to review them, and slide storage takes space. ***Remember, more is not necessarily better***.

12. For blocks, trim the tissue so that it fits easily into a cassette. It should be evenly sectioned and ***no more than 3 mm thick***.

13. Trim unnecessary fat from specimens. Fat tends to fix poorly and is difficult to section, so it is best to have as little as possible in the cassette.

Providing Tissue for Research:

1. A research technician will transport the fresh specimen to the Gross Room along with the requisition and signed consent. See the Gross Room manual for more details.

2. Make sure that the appropriate IRB number with consent is provided. Determine the quantity of tissue, if any, that is available for research.

3. Ask the attending pathologist to look at the specimen. Give tumor sample (if sufficient) to the research technician. Be sure to keep adequate tissue for diagnosis. Do **NOT** give tissue if there is any question about adequacy.

4. The remaining tissue is then processed as a routine/biopsy specimen as usual. Tissue procurement should be clearly documented in the gross description.

Dictation (For Routine and Large Biopsy Specimens):

1. First, always check that the ***name on the requisition matches that on the container***.

2. Dictate the clinical history. Include any pertinent history or findings, whether they are listed on the requisition under "Specimen and Anatomic Sites", "Reason for Procedure", or "Previous Relevant Diagnosis/Other Pertinent Information", or "Specific Questions/Concerns to be Addressed".

3. Follow ***4 basic steps*** when dictating:
   - Document what is received (uterus with attached adnexa, terminal ileum and cecum, etc), in what fixative (in formalin, fresh, Michel's, etc.), and how labeled (see below).
   - State the measurements of the specimen and all attached parts.
   - Carefully describe the abnormality and its relationship to the normal specimen. Include all measurements.
   - Summarize the cassette labeling and numbers of sections.

4. Use ***complete sentences and correct grammar***. Begin each dictation with "The specimen is received in formalin (or fresh, in B5, etc), labeled with "John Doe (state the patient's name that is present on the container)" and "left lower leg" (whatever is written on the container). It consists of …(state what structures are present)". End with "Representative sections are submitted" or "The specimen is totally submitted" in 5 (or however many) blocks. In complicated cases with many blocks, a summary of blocks should be provided. i.e.,

   "Representative sections are submitted as follows:

A1, A2 – anterior and posterior cervix,
A3, A4 – anterior and posterior endo/myometrium,
A5 – leiomyoma"

Do ***NOT*** dictate what percent of a specimen is submitted. Rather, be descriptive: "most of the specimen" is submitted.

Always indicate if a block is submitted for ***decalcification*** (ex: "Representative sections of bone submitted in cassette A1-A4 after decalcification") and add the charge in CoPath (see ordering, p. 9).

5. Have an ***organized approach*** to gross dictation for all specimens that follows the order of the gross examination. That is, start on the outside surface first and follow a logical sequence. For example, for uteri, describe the serosa, the ectocervix, and then after opening, the endocervical canal, the endometrium (give measurements) and myometrium (measure thickness, describe abnormalities). ***Remember, the purpose of the dictation is to provide a description that is clear to someone who has not seen the gross specimen***.

6. Describe all abnormalities, but keep the dictation ***brief and to the point***. For example, normal ovaries can be described as unremarkable, small cysts, corpora albicans and corpora lutea need not be mentioned.

Dictation (For Small Biopsy Specimens):

1. These specimens include only small biopsy specimens that do not require any sectioning. Follow steps 1 and 2 under **Dictation (For Routine and Large Biopsy Specimens)**.

2. Use the **Macros for Dictating Small Biopsy Specimens**. Simply provide the abbreviation to the transcriptionists and fill in the blanks.
   Note: Macros, rather than free dictation, must always be used for these small biopsies.

Labeling Cassettes:

Each specimen container is given a letter (A, B, C, etc). If there is only one block, no additional number is needed, but if there are multiple blocks they are sub-numbered (A1, A2, A3, etc.).

Labeled cassettes are supplied by the Gross Room technician and are placed in trays with the specimen container(s) and requisition. *Be sure to match the number on the cassettes with the case number*. If additional cassettes are needed for a case they must be ordered using the Gross Room computers. After 5:00 PM, changes must be noted on the printed log and in Copath (under histo entry/edit). You may hand write the numbers using the appropriate pencil only after hours (when the engraver is turned off).

Ordering Levels and Special Stains:

Most biopsy specimens (and some routines such as cervical cone biopsies) automatically have 2 or 3 levels provided. In general, levels are not necessary when a biopsy contains more than 3 blocks (except cervical cones), or in biopsies that consist of large tissue fragments (such as breast incisional biopsies or lung wedge biopsies, for example). In such cases, check that the levels are not ordered, and delete them in Copath if they are there.

Special stains are automatically provided on liver biopsies and sentinel nodes. If, however the liver biopsy is done for neoplasm, the stains should be canceled. Similarly, if metastatic carcinoma is found in sentinel nodes at frozen section, levels and immunohistochemistry for cytokeratin (routinely provided) should be canceled (the Gross Room tech or Pathologists' Assistant should be so notified at the time of frozen section).

Blocks for decalcification must have a "decal" charge entered into Copath. If multiple blocks are decalcified, enter "decal" for the first block and "dec add" for each additional block. As noted previously, the blocks undergoing decalcification need to be indicated in the dictation.

All special stains, immunohistochemistry, and molecular studies are ordered through Copath. Stain protocols are available for common specimens in which a panel of stains is usually ordered.

Loading Histology Processors:

At 4:30 PM, the PA will load racks that are in the gross room into the Leica Peloris II processor.

Any work after 4:30 PM will be loaded with the blocks from the Community Campus into the Tissue Tek VIP processors: #1 for routine/biopsy and #2 for fatty tissue, no later than 6:45 PM.

Do NOT load more than 2 racks per processor.

Load any blocks on top of the processor in the containers left by Histology Staff.

Use rack lids, as cassettes tend to float up loading.

Rules for Ordering Special Stains and Immunostains:

Unit of Service for Special Stains

You can order more than one of the same special stain on multiple blocks of the same specimen.

The NCCI policy manual confirms that the accepted unit of service for special stain codes 88312 and 88313 is each different stain per each different block. Specifically, CMS says that when it's "medically reasonable and necessary to perform the same stain on more than one specimen or more than one block of tissue from the same specimen", you may properly report the applicable CPT code (88312, 88313) for each "specimen(s)" or "block(s)".

Unit of Service for IHC

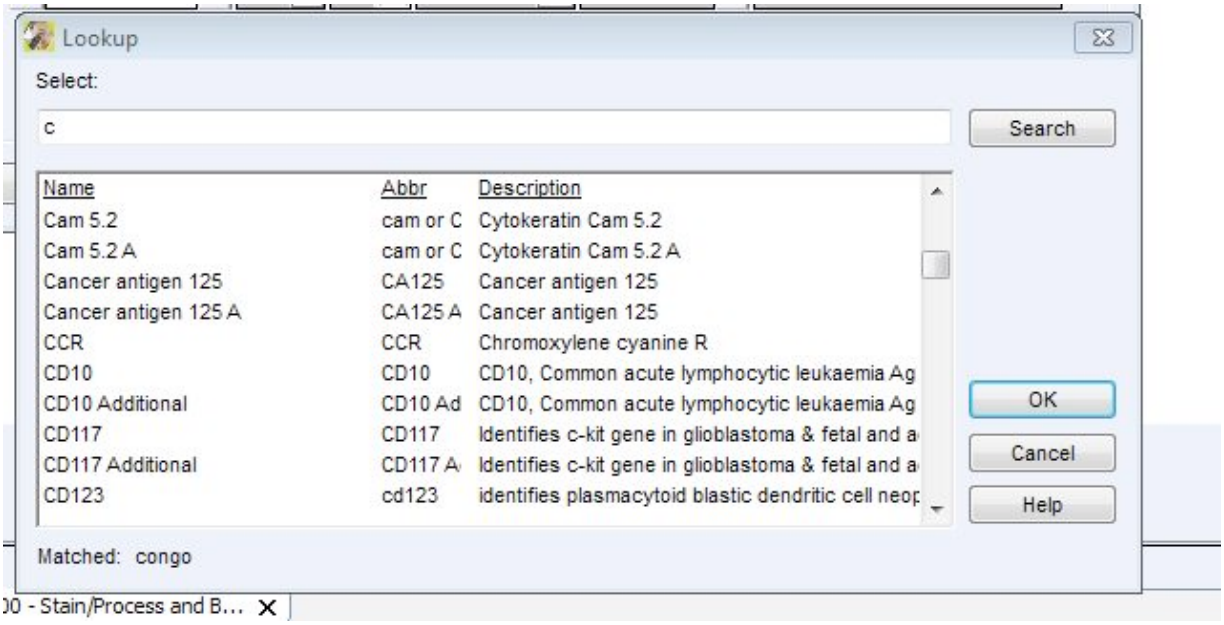
88342 - *Immunohistochemistry or immunocytochemistry, per specimen; initial single antibody stain procedure*

88341 - *each additional single antibody stain procedure (List separately in addition to code for primary procedure)*

Consistent with *CPT-2016*, CMS permits only one unit of charge for single, initial IHC stains per specimen (cpt4 code 88342). All additional immunos ordered must be ordered as 88341.

Currently all immunostains exist in the pull-down menu in CoPath with a CPT4 code of 88342 attached. Each of the existing immunostains is in the process of being duplicated in the dictionary with the CPT4 code of 88341. The first immuno that you order on a specimen will be the same as you would have ordered before, but any additional immunos that you order should have an "A" or "Additional" after the name of the stain.

An example of the pull down menu in Stain/Process and Block Edit is below. As you can see there are 2 entries for each immuno stain, one with an "A" or "additional" and one without.



Role of Pathologist Assistants:

The pathologist assistants are responsible for all technical aspects of the Gross Room (organizing the work flow, keeping the work area neat and clean, stocking supplies, and overseeing all equipment including the cryostat, saws, camera, dictation equipment, cassette labeler, and computers). Residents are expected to cooperate with the pathologist assistant in routine Gross Room maintenance.

Pathologist assistants work side by side with residents in the gross room and on intraoperative consultations. They participate in the teaching of grossing and frozen section techniques, assist in the supervision of junior residents, and they help residents complete their work in a timely fashion. The pathologist assistant will perform grossing duties for residents when they are absent due to illness, vacation, or other reasons.

Supervisory Role of Senior Residents:
Senior residents (PGY3 & 4) rotating in Surgical Pathology are in charge of supervising junior residents (PGY-1 & 2) in the gross room.

Supervising PGY-1 Residents in Surgical Pathology During The First Two Months:

1. Grossing in specimens: The senior resident is there to teach and supervise the grossing of the first year resident, but is not there to do all the grossing. That is, after the first day or so when the general procedures are explained to the resident, the resident should begin grossing under the supervision of the senior resident. They should begin by cutting in small cases and becoming as efficient as possible during the first week or so. Once they have mastered small cases, they can move to large cases. Again, the senior resident needs to carefully supervise them to make sure their gross descriptions are accurate and their sections are both representative and have the appropriate size and thickness. Obviously, these inexperienced residents will be slow, and after the first week or two it will be the senior resident's responsibility to make sure that the work gets done. That is, they may have to cut in many specimens initially, but the aim is that by the end of the first month the residents will be able to handle the load themselves. By the second month, the resident should be able to work independently, although the senior resident needs to carefully supervise them and help when necessary to get the work out.

2. Sign out of cases: The first year resident is expected after the first or second week to write up their cases in an appropriate fashion. The fellow/senior resident should oversee this process. They should be available to review slides, organize the cases, and show residents how to sign out their cases.

3. Frozen section coverage: The senior resident is responsible for teaching the first year residents appropriate gross examination of tissue submitted for intraoperative consultation. They will also teach the residents how to use the cryostat and how to stain their sections. The residents should begin cutting sections within the first week of being on service. They should practice first by using blocks from which diagnostic sections have been cut and gradually move to cutting sections primarily. The aim is that by the second month they are able to cut sections independently.

Supervising Junior Residents After the Initial Two Months:

Senior residents will continue to supervise PGY-1 after the initial two months and will supervise PGY-2s, as well, in the Gross Room and with frozen sections. Daily case load will be assigned by the senior PA under the guidance of the attending pathologist on routine service that day. While cases will be assigned to residents according to experience, it is the responsibility of the resident to make sure that he or she is exposed to all types of complex specimens.

FROZEN SECTIONS

Residents should be available for frozen sections at 7:30 AM every day.

PGY-1 and 2 residents will cut all frozen sections when assigned to this service.

PGY-2 and 3 residents should concentrate on the interpretation aspect of frozen sections. Pathologist's assistants will cut the frozen sections for them, whenever possible. Senior residents are responsible for obtaining all pertinent clinical information, for gross examining the specimen and assisting in the selecting of sections with the attending pathologist and for formulating a diagnosis prior to the attending pathologist.

The resident on frozen sections, regardless of their level of training, is responsible for checking the OR schedule the night before to assure that all pertinent information is available for the attending pathologist during the frozen section. This will include prior pertinent history, results of prior outside diagnoses (as per EMR/Epic), and all relevant prior in-house reports and slides in tumor cases.

Frozen Section Guidelines:

1. View online frozen section technique video (www.pathologyinnovations.com) before starting.

2. Be sure that the label on the specimen jar matches the label on the frozen section requisition form. If more than one specimen is received from the same patient, label both the specimen container and the requisition sheet with letters (A, B, C, etc.), being sure that each part has the appropriate letter in both places. The letter should be written with an indelible marker on both the side of the jar and the lid.

3. Time stamp the specimen requisition when received and again when completed.

4. Keep the workstation organized in such a way that specimens are kept with the corresponding jars. This is especially important when specimens from more than one patient are received, but is also important when multiple specimens are received from a single patient.

5. Note gross features of specimen. If necessary, write down dimensions (only if specimen will be altered in such a way that measurements cannot be taken after the frozen section; e.g., ovarian cysts, parathyroid, etc.)

6. Label, using pencils provided, each slide with the patient's last name and first initial, the date, "FS" (adding a letter, "A", "B", etc., when appropriate), and case number if available before cutting the frozen section. If more than one frozen is performed on a specimen, the slides should be labeled FSA1, FSA2, etc., and these should be included in the written diagnosis. ***Do NOT place sections on unlabeled slides.***

7. After completing the frozen section, remove the chuck from the cryostat and unfreeze the block by dipping it in formalin in a jar. Place tissue in a cassette, label with patient name or surgical pathology number if available, and FS with appropriate letter, and place in labeled specimen jar.

8. Additionally label the frozen section slides with the surgical pathology number when it is available.

9. Dictate the clinical history, gross description, and frozen section diagnosis. ***This should be done only after the frozen section is complete and results have been given to the surgeon***.

10. After use, clean and thoroughly dry each chuck with the towel provided. Use brush and 100% ethanol as needed. Place the chuck back in the metal box in the cryostat and cover. ***Do NOT leave the chucks out of the cryostat.***

11. Rinse the instruments and the workstation after each frozen section. Cover the stains and make sure that the area is left neat and clean.

12. Record the frozen section data on the clipboard next to the multihead microscope. Be sure to include time the specimen is received and time the frozen section results are reported to the surgeon.

13. Do NOT wear gloves in the microscope area.

Note: Pathologist's Assistants are responsible each day for checking supplies and making sure the cryostats are in good working order. Residents must, however, clean up after each frozen section and keep the room neat

SIGNING OUT CASES

1. Review the ***Gross Description****:*
   - Make sure that the patient name at the top of the working draft matches the name on the specimen container as recorded in the Gross Description.

   - Make sure that all parts received are accounted for and that the specimens described on the requisition form match those described on the specimen containers.

   - Make sure that someone who has not seen the case can understand the gross findings.

   - Use full sentences and proper grammar.

   - Check for typographical errors.

2. Diagnose separately each part (specimen) received. The diagnosis should be preceded by the corresponding letter (found on the requisition form and Gross Description). For example:

   A. Esophagus at 15 cm, biopsy –
   B. Gastroesophageal junction, biopsy –
   C. Stomach, biopsy –
   D. Etc.

   Specimens can be grouped if the diagnosis is the same, but all letters need to be included:

   A-F. Prostate, right anterior, right mid, right posterior, left anterior, left mid, left posterior, needle biopsies – Fragments of benign prostate.

   Be sure that all parts are accounted for.

3. The ***Diagnosis*** should include *site* and *procedure* as in the following examples:

   Breast, left, excision – Infiltrating ductal carcinoma

   Skin, right elbow, punch biopsy – Psoriasis

   Lung, right upper lobe, transbronchial biopsy – Necrotizing granulomatous inflammation

   - Be specific about the procedure, especially with biopsies versus excisions (core biopsy vs incisional biopsy vs mastectomy/excision in breasts). For certain organs the type of biopsy should be additionally specified (transbronchial vs. bronchial vs. surgical/open biopsies in lungs).

   - Do not assume that you know the type of procedure (if not specified on the requisition). That is, do not state “radical hysterectomy”, “radical nephrectomy”, or "total thyroidectomy" but rather use a generic term such as “hysterectomy”, “nephrectomy", "thyroidectomy", or simply “excision”.

Certain routine and mundane specimens may not need to have site and procedure specified. For example a diagnosis of "Hemorrhoids" or "Products of Conception".

4. Keep the Diagnosis as brief as possible including only clinically significant findings. Use the Microscopic Description to embellish on the findings.
   For example,
   "Endocervical Curettings – Endocervix with mild chronic inflammation, detached fragments of squamous epithelium with mild dysplasia, and small fragments of proliferative endometrium" is better diagnosed as:
   "Endocervical Curettings - CIN1 (LGSIL)". (See Microscopic Description.)

5. Whenever possible, Use the **Coded Diagnoses** templates and instructions.

6. In general, it is best not to include negative findings in the Diagnosis, especially when they contain the word, "carcinoma", "atypia" or "malignancy".
   For example,
   "Breast, left, core biopsy – Cysts, apocrine metaplasia, focal intraductal hyperplasia, mild chronic inflammation. No carcinoma identified." is better diagnosed as follows:
   "Breast, left, core biopsy – Fibrocystic changes. No evidence of atypia or malignancy".

   Note: Margin status (negative or involved) is appropriate in the Diagnosis, especially in skin excisions or other routine cases.

7. A ***Microscopic Description*** should be used *only to provide additional information* to the clinicians that is not present in the Diagnosis. Keep it short and to the point. Remember, no one cares about cellular details that lead you to make the diagnosis, but discussing the differential diagnosis, additional details on margins or extent of the lesion, for example, may be important.

   - Do **NOT** state "clinicopathologic correlation suggested" (or any similar statement).
   - Do **NOT** indicate "Discussed with Dr. So-and-So at 12:15".

   In general, it is best not to suggest a specific treatment.

8. Notes can only be used for clinical comments that do not involve any histopathologic details, which belong in the microscopic description. Notes can be added in the diagnostic comment section, which already include the word "Note", even though one can see if while editing the report.

9. Be ***decisive*** in your Diagnosis, and if you need to hedge, do so in the Microscopic Description. For example, rather than diagnosing:
   "Lung, right upper lobe, bronchial biopsy – Atypical cells suggestive, but not diagnostic of, non-small cell carcinoma. Cannot exclude reactive atypia", it would be better to diagnose:
   "Lung, right upper lobe, bronchial biopsy – Atypical cells. (See Microscopic Description.)"

10. Templates should be used for all primary cancer excision specimens (See **Guidelines for Using Cancer Staging Templates** pg. 14), breast biopsies and lumpectomies, and for benign uteri. Copies can be found on the shelf in the sign-out room (see attached list of available templates). Please ask Susan Jakubowski to replenish if copies are not there.

11. The following format should be used when diagnosing lymph node dissections for cancer:
    For *negative* nodes,
        "Lymph nodes (8), right neck, level 2, excision – No significant pathologic changes". (*Do NOT follow with "(0/8)*")
    For *positive* nodes,
        Lymph nodes, left axilla, excision – Metastatic carcinoma to 3 of 9.

12. For billing purposes, the results of all special stains including immunohistochemistry need to be documented. Be sure to state if the stains were performed on more than one block. For stains including two antibodies (p62/myosin or p63/AMACR), add the word "multiplex" before the stain. Report results for each stain and avoid statements such as: "Cytokeratins support the above diagnosis". This information should be included in the Microscopic Description.

13. Check all CPT-4 Codes and make corrections on Working Draft. (See Guidelines for Using CPT4 Billing Codes, pg 18.)

14. Carefully proofread all diagnoses to avoid typographical errors.

CANCER STAGING TEMPLATES

1. Templates are available for most of the common cancers and are kept on the shelf in the sign-out room. A list of all templates is posted on the wall in the sign-out room near the template copies. Please inform Susan Jakubowski if forms become depleted.

A "Generic" template is available to use with uncommon cancers for which a specific template is not available, and it can be modified as needed depending on type and site of tumor. Be sure to look in the AJCC staging manual for specific required fields as well as pTNM staging criteria.

There is also a template for benign uteri that should be used in all non-neoplastic uterine cases.

2. The tumor templates are used for all *primary invasive cancers*, not for metastatic or in-situ cancers (except for DCIS of breast cases).

3. Do NOT use templates for resection specimens in which no residual carcinoma is present (i.e., mastectomy specimen with no residual invasive tumor).

4. A pTNM stage needs to be determined for all resected invasive primary cancers using guidelines provided on the bottom of each template form.

5. The pTNM staging results should be placed at the end of the template. It should take into consideration all of the specimens received. That is, if a laryngeal cancer is received in specimen A and cervical neck nodes in specimen B, the "N" should include the neck dissection results, but the "pTNM" will be reported at the end of the template for specimen A.

6. In general, templates are not used for biopsy specimens. Exceptions include *breast biopsies* and *skin biopsies containing melanoma.*

7. pTNM staging is generally not done on biopsy specimens unless the procedure is an excisional biopsy.

9. For all templates, be specific about the procedure performed (use the information on the requisition form, but do *not* make assumptions about procedure). If you are not sure, just state "excision/resection (or partial excision/resection)".

10. If tumors have been previously treated (radiation or chemotherapy) the pTNM code needs to be preceded by "y" (ypTNM).

CPT4 BILLING CODES

1. CPT codes are printed on every working draft and should be checked for appropriateness.

2. If a mistake is identified, cross out the incorrect code, write in the correct one, and inform your attending.

3. Remember, in general:
   - 88300 - Gross only
   - 88302 - Incidentals
   - 88304 - Small routines
   - 88305 - Most biopsies
   - 88307 - Large specimens and some biopsies
   - 88309 - Large complicated specimens

   Be sure to look on detailed list (attached at end), to confirm individual specimen billing.

4. Remember, specifically:

   - All immunos, special stains, and special procedures (decalcifications, frozen sections, etc.) must be specifically listed within Gross or Microscopic Description.

   - The number of special stains/immunos listed must correlate with the number of billing codes.

Surgical Pathology Textbooks: Residents are expected to become familiar with standard reference textbooks for surgical pathology and all subspecialty areas in surgical pathology. An updated collection of these textbooks is available in the sign out room for ready reference. For recent literature, PubMed is the best online resource, and is freely available on all Upstate computers. Examples of standard surgical pathology textbooks are:

Histology: Histology for Pathologists (Sternberg)
Surgical Pathology: Rosai, Sternberg, AFIP series, WHO "blue book" series
Skin: Lever, Weedon, WHO
Lung: Katzenstein, Leslie, WHO
GYN: Robboy, Crum, Mazur, WHO
GI: Odze, WHO
Soft tissue: Weiss and Goldblum, WHO
Head and Neck: Gnepp, Wenig, Barnes, WHO
Breast: Rosen, WHO
Bone: Bullough, Nielsen/Rosenberg, Folpe/Inwards i, WHO
CNS: Perry and Brat, WHO

On-Call: On weekends and after 5 PM on weekdays until 7:30 AM, the resident and attending pathologist on-call handle all surgical pathology and cytopathology emergencies, including frozen sections, biopsy specimens, and rarely, cytology samples. The resident on-call should contact the attending on call immediately after being notified to discuss the details of each case.

Responsibilities and Objectives

First-Year Resident
First Month: Work with the assigned senior resident under the supervision of the attending pathologist. Learn to take sections and dictate gross findings. Start with small routines and gradually start grossing large specimens, taking at least a large specimen on each grossing day in the first two weeks. By the third week the resident should be able to handle most specimens with the assistance of the senior resident, and by the end of the fourth week he/she should be able to handle most non-complex specimens. Microscopic slides should be reviewed, and an appropriate diagnosis written. Reviewing normal histology should be a priority, but features of neoplasms and other lesions should be understood as well.

Specific Objectives:

First Month:

Week 1: Gross in and dictate at least 10 small specimens and one uncomplicated intermediate specimen (thyroid, uterus, spleen) per day. Provide written documentation of cases handled each day. Write up cases under supervision of senior resident.

Week 2: In addition to cases listed in Week 1, one complex large case must be grossed in each day. Document the cases. Write up cases under supervision of senior resident.

Week 3 and 4: Up to 2 complex cases and multiple intermediate and small cases per day. Cases must be documented. Write up cases under supervision of senior resident.

Resident will be evaluated for ability to progress to nearly independent grossing in Month 2.

Second Month: The resident should be capable of grossing in a variety of specimens in a timely fashion (to finish on most days by 5 PM). He/she works under supervision of senior resident and the attending pathologist. At least two large specimens and multiple smaller specimens should be grossed in each day. Type of specimens that has not been previously seen should be selected over familiar ones. Keep track of the specimens for documentation. He/she should be able to write a diagnosis in appropriate format.

Resident will be evaluated by the faculty at the end of Month 2 on whether he/she has met the objectives for both specimen grossing and written diagnosis.

Second -Year Resident
These residents are expected to work relatively independently in the gross room and frozen section suite (with approval of and under the supervision of the attending pathologist). They are expected to correctly diagnose the majority of cases and ***write a correctly formatted report***.

Third and Fourth-Year Resident
These residents will assume a supervisory role in the gross room and frozen section suite. In the gross room, they will oversee and teach junior residents and medical students. They will follow the work flow to make sure that cases are appropriately completed. In the frozen section suite they will supervise junior residents in performing frozen sections and will review slides and make preliminary diagnoses before reviewing the case with the attending.

Methods of Evaluation
All residents work directly with an attending pathologist, and their skills in gross description, microscopic diagnosis, formulating an accurate surgical pathology report, general medical knowledge, and communication are closely monitored and recorded in written evaluations following each rotation. Residents are encouraged to get verbal feedback from the attending pathologist at the end of each weekly sign out.

Year-Specific Goals in Surgical Pathology (Patient Care and Medical Knowledge)

PGY-1

By the end of the first year of training:

The resident should demonstrate familiarity with the Surgical Pathology Grossing Manual, Guidelines for Residents and Fellows, List of Coded Diagnosis, and Cancer Templates.

The resident should be able to dictate informative gross descriptions with proper cassette summaries and cut appropriate sections without direct supervision on all biopsies and simple routine specimens and most cancer cases.

The resident should be efficient in managing cases so that cases are ready for sign out in a timely fashion observing target threshold turn-around time in all cases. This includes proof-reading of gross descriptions and making sure that all slides corresponding to a specific case are present and in order.

The resident should be able to teach proper dictation and grossing techniques to a new first year resident.

The resident should be able to perform frozen sections in a timely manner.

The resident should be able to microscopically diagnose most simple routine specimens, including most common and simple cancer cases.

PGY-2

By the end of the second year of training:

The resident should be able to dictate informative gross descriptions with proper cassette summaries and cut appropriate sections without direct supervision on most common surgical specimens.

The resident should be able handle most steps of intraoperative consultations, including correct orientation of specimen, selection of sections, and cutting the frozen sections without direct supervision and in a timely manner.

The resident should demonstrate the ability to work up cases properly, assessing the need for additional specimen sampling, additional sections (levels), histochemical stains, immunohistochemical stains, and molecular studies in most routine surgical pathology cases.

The resident should be able to microscopically diagnose and provide appropriate differential diagnosis in most routine surgical pathology specimens. The resident should be able to use cancer templates and provide pTMN staging in most common cancer cases.

The resident should demonstrate efficiency in the handling of most surgical pathology specimens in terms of observing the threshold turn-around time for biopsies and routine specimens, and timely ordering of ancillary studies.

The resident should demonstrate the ability to communicate appropriately with clinical colleagues in terms of providing frozen section diagnosis at the time of surgery, working diagnoses, if the cases are not complete, and also in terms obtaining pertinent clinical information.

The resident should be able to supervise and teach proper dictation and grossing techniques to a new first year resident.

PGY-3

By the end of the third year of training:

The resident should be able to dictate informative gross descriptions with proper cassette summaries and cut appropriate sections without direct supervision on all types of surgical specimens.

The resident should be able handle intraoperative consultations, including correct orientation of specimen, selection of sections, cutting the frozen sections, and interpretation in most routine cases without direct supervision and in a timely manner.

The resident should demonstrate the ability to prepare succinct but complete surgical pathology reports, including gross descriptions, microscopic descriptions with reference to ancillary studies when necessary, and final diagnoses in most routine surgical pathology specimens.

The resident should be able to microscopically diagnose with or without ancillary studies most routine surgical pathology specimens. The resident should also be able to systematically approach complex cases in terms of formulating a differential diagnosis

The resident should demonstrate efficiency in the use of ancillary studies needed for diagnosis or prognosticating purposes.

The resident should demonstrate the ability to communicate appropriately with clinical colleagues and actively participates in multidisciplinary conferences. The resident should also demonstrate the ability to prepare and present cases at the surgical pathology unknown slide conference.

PGY-4

By the end of the fourth year of training:

The resident should demonstrate the ability to dictate and compose complete surgical pathology reports, which are ready for electronic signature, with minimal if any corrections by the attending pathologist, and are diagnostically accurate.

The resident should be able to microscopically diagnose with or without ancillary studies most surgical pathology specimens

The resident should be able to incorporate clinical and imaging aspects of a case to reach a final diagnosis.

The resident should be able to supervise junior (PGY-1 and 2) residents in any aspect of grossing or microscopic sign out of Surgical Pathology.

The resident should be able to independently perform all aspects of intraoperative consultation.

GENERAL GOALS THROUGHOUT THE ENTIRE DURATION OF RESIDENCY TRAINING IN ADDITION TO PATIENT CARE AND MEDICAL KNOWLEDGE.

The resident should be able to score the national mean for that year's RISE exam.

Professionalism

The resident should demonstrate professional conduct with regard to interpersonal interactions with peers and clerical and technical staff.
The resident must demonstrate a prioritization for completing patient care.

The resident should assume responsibility over their cases.

The resident should perform appropriately and timely on assigned duties

Practice-Based Learning and Improvement

The resident must demonstrate self-motivation in the desire to critically review their work to continue to find ways of improving their clinical and diagnostic skills.

The resident should demonstrate adequate and appropriate review of the literature.

The resident should be able to seek help from faculty when is appropriate.

Interpersonal and Communication Skills

The resident should demonstrate growth in the area of interacting with peers and attending staff

Residents should be able to clearly and accurately communicate in a professional manner to clinicians.

Conferences

Residents are expected, under faculty supervision, to present at interdisciplinary conferences.

VAMC (Veterans Administration Medical Center) Surgical Pathology Rotation

Length of Rotation: 5 months (required)

Teaching Staff:

Yiran Dai, MD – Director
Henry Friedman, MD
Seena Kumar, MD
Shridevi Karikehalli, MD (Residency Liaison)

The resident should always be physically present in the laboratory, available by pager, or should always communicate their absence to the attending pathologist on service if out of the laboratory during customary working hours. Remember, as a pathologist, you are a consultant aiding in the treatment of a patient, and availability for clinicians as well as your attending is essential.

Goals

1. Acquire and demonstrate knowledge of the basic steps needed in specimen acquisition, gross specimen examination and dissection, and routine specimen processing.
2. Acquire and demonstrate knowledge of the manifestation and pathophysiology of the disease identified such that proper sectioning of the specimen will document and demonstrate disease and also demonstrate any needed clinically relevant information for proper patient treatment (e.g., staging of cancer, margin involvement by the tumor, etc).
3. Demonstrate knowledge of the proper use of frozen section diagnosis at the time of surgery for clinically relevant patient management.
4. Acquire sufficient skills for microscopic interpretation of routine and fairly common surgical specimens, including the coherent discussion of microscopic diagnosis (as well as any needed special studies or stains) in the final report.

Objectives

By the end of the five month rotation in surgical pathology, the resident should be able to:

1. Interpret surgical pathology requisitions and obtain additional information from clinical personnel as required.

2. Show knowledge of the basic steps in gross description and examination of specimens and appropriate sampling for microscopy, including an understanding of the manifestations and pathophysiology of diseases identified within the specimen, as appropriate.

3. Perform microscopic examination and interpretation of slides from common specimens.

4. Obtain consults as required for adequate report sign-out.

5. Obtain and interpret special studies (e.g., electron microscopy, histochemistry, immunohistochemistry), as needed.

6. Reconcile your interpretation with all other available information including clinical history, cultures, radiologic studies, and previous pathology specimens (e.g., compare with previous surgical and cytopathology slides, as needed).

7. Create a meaningful, complete, communicative professional report for the attending physicians, including an appropriate gross and microscopic description and/or comment, as needed.
8. Become familiar with procedures for handling and processing special tissues such as lymph nodes, tissue for estrogen/progesterone receptors, metabolic bone biopsies, nerve biopsies, etc.

9. Cut, stain, and interpret diagnostically useful frozen sections.

10. Present cases at various conferences, as needed.

Curriculum

The content of this rotation consists of the proper handling, sectioning, sampling, and gross and microscopic examination of specimens sent to surgical pathology such that the final surgical pathology report is complete and clinically relevant for proper patient management and therapy. Each aspect of the above mentioned handling of specimens, including sign-out, is based on attending supervision with appropriate reading of surgical pathology texts (such as Rosai and Ackerman's Surgical Pathology, 9th edition, Gray's Anatomy, etc.) for both gross and microscopic examination of specimens. Attending teaching of the resident is primarily done by direct discussion of gross specimens (at the time of grossing and with any needed VA templates) as well as hands on demonstration by the attending, as required. In addition, case discussion at the time of microscopic sign-out as to features pertinent to diagnosis/interpretation occurs while examining slides at the microscope. Any needed references, including books, journal articles, etc. are made available and discussed at this time (as the case is signed out) or initially in the gross room.

Duties/responsibilities

Read general texts (and specialized texts, as needed) as well as relevant journal articles on surgical pathology, especially those articles pertaining to current case sign-out.

Provide adequate resident coverage on any "off" day, such as for vacation, illness, etc.

Surgical Specimens: The resident is responsible for:

1. Following procedures as outlined in a standard gross manual (such as Rosai and Ackerman's Surgical Pathology, 9th edition) and/or VA template for handling and processing tissues.

2. Rotating with other residents in cutting and signing out surgical specimens (per schedule, as required).

3. Checking the typed history and gross description for typographical errors and making corrections. Reviewing slides and preparing written microscopic descriptions and diagnoses following the appropriate format. Obtaining and comparing relevant old slides from the file.

4. Having cases ready to sign out with attending pathologist according to set priorities (this includes appropriate coding of report).

5. After final typing, checking for typographical errors before final signing.

6. General neatness and safety in the cutting room and reading room, which are required at all times.

Frozen Sections: The resident is responsible for:

1. Always be physically present in the laboratory or available by pager

2. When called for a frozen section, obtaining the specimen, patient's information, imaging studies (if needed), and path requisition.

3. Cutting and staining the frozen section; reviewing it with attending.

4. Preparing report for the operating room and communicating results of frozen section per routine protocol in place at the time of communication with the surgeon.

Graduated responsibility in this section: As residents become more familiar with basic grossing and sign-out, they will acquire more responsibility for handling the specimens, ordering additional stains/tests, and communication of results with clinicians, all with appropriate attending discussion, supervision, and input.

Monthly Resident Presentation:

The resident is required to do a short presentation, about 20 minutes, at the end of the rotation. The resident may select any topic in surgical pathology, a case presentation and interesting journal articles. The resident may be asked questions pertaining to his/her presentation. This will be evaluated by the attending faculty members.

Method of Evaluation

Residents will be evaluated by the attending pathologists concerning the basic fund of knowledge during gross specimen preparation, microscopic interpretation and sign-out and clinician or conference presentation of cases. Resident competencies will be evaluated and assessed as follows:

Resident Assessment

Patient Care

The surgical tissue examination is a consultation requested of the pathologist by the attending physician. The resident must demonstrate a satisfactory level of diagnostic competence and the ability to provide effective pathologic consultation under appropriate circumstances.

Medical Knowledge

The resident will demonstrate knowledge about established and evolving diagnostic scientific practice by developing proper diagnoses and by documenting application of new knowledge as documented in the Surgical Pathology report. In this regard, the final diagnoses rendered by the resident will be judged as to accuracy and appropriateness. Application of new knowledge will be judged by the inclusion of literature references in the report.

Practice-based learning and improvement

The resident will demonstrate the ability to investigate complex cases, evaluate their diagnostic and consultative service, and assimilate scientific evidence into their practice for the continual improvement of their patient care. As with medical knowledge this will be documented on a case-by-case basis through the attending pathologist's assessment of the written report and through conversation with the resident.

Interpersonal communication skills

In that professional interpersonal interaction and communication is paramount to a successful Surgical Pathology practice, the resident will demonstrate effective, respectful, and professional communication with staff, and physicians. This will be fostered by close pathology attending consultation initially and will be evaluated by faculty observation of resident performance on individual cases.

Professionalism

The resident must demonstrate a commitment to medical ethics, sensitivity to diverse patient populations, and professional responsibilities. Completing reports in a timely manner, being sensitive to religious concerns of families, and recognizing the importance of confidentiality in medical practice are always monitored by all faculty.

Systems-based practice
The resident will demonstrate an awareness of and responsiveness to the health care system context in which an autopsy service must function. This includes an understanding of the costs and benefits of this medical practice, the importance of this practice to the quality improvement aspect, to other medical services and the hospital, and to society in general. The costs of requesting unnecessary tests, late completion of the report and failure to communicate appropriately with other medical services will be monitored and discussed with the resident.

Note: All faculty members who have had significant contact with the resident during the VA rotation in surgical pathology will evaluate the resident via the "MedHub" program available through the SUNY Department of Pathology. This program prompts electronic evaluation at the end of each rotation based on the (above) six competencies of the ACGME Outcomes Project. This evaluation program also allows for comments on the residents strengths and weaknesses during their rotation, to provide the resident and the department constructive criticism for future resident improvement.

CLINICAL PATHOLOGY ROTATIONS

CLINICAL CHEMISTRY AND MICROSCOPY
Length of Rotation: 1.5 months

Teaching Staff:
Katalin Banki, M.D., Director, Special Chemistry
Robert Sunheimer, MS, MT(ASCP), SC, SLS, Professor of Clinical Laboratory Science

Goals
The goals of the Clinical Chemistry rotation are to train pathologists capable of (1) acting as a medical consultant to clinicians and patients, (2) serving as a laboratory director of Clinical Chemistry, (3) integrating the laboratory into the health care delivery system and (4) supporting biomedical research.

Graduated responsibilities
The PGY-1 rotation is conducted entirely in the Core Laboratory and Special Chemistry. The resident will be able to discuss pathophysiologic correlations of common clinical chemistry test results and interpret the whole spectrum of routine clinical chemistry assays and body fluid microscopy. Residents must be able to communicate effectively with laboratory personnel and medical staff.

In the PGY- 2/3 rotation, residents are assigned simultaneously to Special Hematology and Clinical Chemistry. In addition to continuing their PGY-1 activities, residents gain experience in laboratory practices, such as proficiency and competency testing, test selection and validation, trouble shooting and lab inspection by working alongside the Clinical Chemistry and Special Hematology attendings, in all aspects of their work. Residents are expected to gradually assume the role of the laboratory director. They must be able to apply quality management in the Clinical Chemistry Laboratory, make determinations on the rational use of diagnostic tests and communicate effectively with medical staff, administration and regulatory agencies.

Objectives

Junior Resident – First Pass

Patient Care

Gather history and clinical data in relevant cases.
Interpret and correlate abnormal laboratory values.
Provide expert consultation regarding unusual or unexpected results.
Act as a consultant to patients with help from senior residents and the attending.
Take calls for the Core Laboratory and Special Chemistry with help from senior technologists, supervisors and attendings. Write interpretations of SPEP, UPEP, CSF electrophoresis, immunofixation and amniotic fluid analysis.
Participate in day-to-day good laboratory practices: quality control, calibration, monitoring of test performance.

Medical Knowledge

Acquire a working knowledge of basic physiology.
Understand the biotechnology on which laboratory diagnostics are based.
Know the different types of body fluids analyzed.
Be familiar with the use of sample collection tubes.
Be familiar with most of the common analytical assays performed in the Core Laboratory.
Identify pre-analytical, analytical and reporting issues of tests.
Apply quality control rules: Levey-Jennings, shift, trend.
Be familiar with the instrumentation of the Core Laboratory.

Curriculum

Amniotic fluid
    Beckman spectrophotometer
Electrophoresis (CSF, serum, urine)
    Sebia Hydrasys & Scanning Densitometer
Blood gases
    Blood gas analyzers
Acid-base disorders and electrolytes
Ion selective electrode
    Roche Modular: principle of operation and troubleshooting
    Learn methodology and perform Na, K, CO2, Cl
Liver and cardiac function tests
Enzyme kinetics
Spectrophotometry
Methodology and perform AST, CK
Cardiac markers: troponin T and CKMB, NT-pro BNP
Microscopy
    Yellow Iris: Automated microscopic examination (urine, CSF, ascites and pleural fluid). Residents will understand clinical indications for body fluid analysis and sample preparation techniques (manual cell counting using hemocytometer, cytospin preparation). They will gain proficiency in interpretation of body fluid cell morphology and recognize malignant cells. They will consult with cytology or hematology about abnormal cell findings and communicate the results to clinicians. They gain skills in using polarized light and will identify uric acid crystals in synovial fluid. They will understand indications and methods for urinanalysis, including manual and automated microscopic examination of urine sediment and urine chemistry.

Practice-Based Learning
Review the scientific literature and correlate with patient management in difficult cases.
Apply evidence-based medicine.
Use information technology effectively to support lifelong learning.
Understand basic laboratory statistics and population-based statistics (analytical sensitivity and specificity, predictive values, odds and likelyhood ratios, risk ratio, mortality/morbidity rates)

Systems-Based Practice
Interact with the Core Lab Supervisor (Steve Gwilt) and the QC Officer (Larry Brown) in identifying and resolving laboratory issues.
Be familiar with the basics of quality systems management.
Be familiar with laboratory automation, laboratory middleware and autoverification.
Understand basic concepts of QA and QC protocols, normal ranges, analytical ranges, critical values.

Professionalism
Demonstrate compassion, respect and commitment to your patients.
Be responsive and respectful to your co-workers, including faculty, peers and support staff.
Strictly adhere to confidentiality rules.
Aim to be dependable, punctual and strive for excellence in patient care.

Interpersonal and Communication Skills
Write clear and concise interpretations. Recognize the gradations of definitive diagnosis, differential diagnosis, possible diagnosis and suspicion.
Be able to provide direct consultations to referring clinicians and other health care providers.
Follow proper documentation practices.
Be able to present your findings at interdisciplinary conferences (adult Medicine, Pediatrics).
Communicate effectively with laboratory personnel.

Junior Resident – Second Pass

Patient Care
Write interpretation of SPEP, UPEP, CSF, immunofixation and amniotic fluid testing.
Review and confirm body fluid microscopy results.
Act as a consultant to patients. Ask help from the attending, if needed.
Provide expert consultation regarding unusual or unexpected results.
Take calls for the Clinical Chemistry and Special Hematology with help from attendings, if needed.
Participate in test selection and test validation.
Overview proficiency testing. Review and sign test reports and write up corrective action if needed.
Revise one laboratory protocol. Review the scientific literature and test menus of leading universities and commercial labs, alternative methods, our test performance and check the protocol for errors. Work closely with the lab supervisor or lead technologist.
Complete Inspection Team Member Training.
Attend monthly QA/PI meetings (Dr. Elkins)

Medical Knowledge
Build on competencies of PGY-1

Curriculum
Renal function
Metabolic disorders
Creatinine and BUN
Perform analysis on a synovial fluid for uric acid crystals
Perform a complete urinalysis on a specimen
Endocrinology
    Thyroid, Adrenal, Endocrine Pancreas and Parathyroid
Principle of immunoassays
    Roche Modular E170, Abbott IMX and Axsym
Hemoglobin A1c
    BioRad Variant HPLC:
Toxicology and Therapeutic drug monitoring (TDM)
    Understand basic concepts of pharmacokinetics and pharmacodynamics
    Trough, peak, steady-state drug levels
    Roche Modular E170, Abbott Axsym
    Theophylline, digoxin, and gentamicin
Tumor markers
    Principle of fluorescence immunoassay and electrochemiluminescence
    CEA and beta HCG
Reference laboratory testing
Understand and be able to correct for positive and negative interferences.
Understand the theoretical basis, pitfalls and benefits of mass spectometry.
Be familiar with the theoretical basis, pitfalls and advantages of proteomics.

Practice-Based Learning
Review the scientific literature in difficult cases and correlate it with patient management.
Apply evidence-based medicine.
Use information technology effectively to support lifelong learning.
Identify practices to improve laboratory safety.
Understand general and test-specific standards for method development by CLSI and CAP.
Participate in on-going method validation.

Systems-Based Practice
Interact with the Core Lab Supervisor (Steve Gwilt) and the QI Officer (Larry Brown) in identifying and resolving laboratory issues.
Apply quality systems management practices.
Attend section meetings of the Core Lab and Special hematology/ Special Chemistry lab.
Update on laboratory protocol (See in Patient Care section).

Professionalism
Demonstrate compassion, respect and commitment to your patients.
Be responsive and respectful to your co-workers, including faculty, peers and support staff.
Strictly adhere to confidentiality rules.
Aim to be dependable, punctual and strive for excellence in patient care.

Interpersonal and Communication Skills
Write comprehensive consultative reports.
Provide advice to referring clinicians and other health care providers.
Follow proper documentation practices.
Be able to present your findings independently at interdisciplinary conferences.
Communicate effectively with laboratory personnel.

Senior Resident

Patient Care
Write interpretations of SPEP, UPEP, CSF, immunofixation and amniotic fluid testing.
Review and confirm body fluid microscopy results.
Act as a consultant to patients with overview from attending.
Provide expert consultation regarding unusual or unexpected results.
Take calls for the Clinical Chemistry and Special Hematology, mostly without help from attending.
Participate in test selection and test validation.
Understand method evaluation: linearity, reportable range, method comparison, receiver operating curve (ROC), limited and extended test validation.
Overview proficiency testing. Review and sign test reports and write up corrective action.
Revise one laboratory protocol. Review the scientific literature and test menus of leading universities and commercial labs, alternative methods, our test performance and check the protocol for errors. Work closely with the lab supervisor or lead technologist.
Assume the role of Director of Clinical Chemistry

Medical Knowledge
Build on competencies of PGY-1 and PGY-2
Review New York State Department of Health: Clinical Laboratory Standards of Practice 2008.
Laboratory statistics
Video lecture by Robert Schmidt, ARUP: Testing a Test: Beyond Sensitivity and Specificity (http://www.arup.utah.edu/education/testing_test.php?unique=1293561085)
Point of care testing.

Practice-Based Learning
Review the scientific literature in difficult cases and correlate it with patient management.
Apply evidence-based medicine.
Use information technology effectively to support lifelong learning.
Identify practices to improve laboratory safety.
Understand method validation and process control.
Participate in on-going method validation.

Systems-Based Practice
Apply quality systems management practices.
Attend section meetings of the Core Lab and Special Hematology/ Special Chemistry lab.
Attend monthly University Hospital Anticoagulation Committee meetings (Dr. Banki).
Attend monthly departmental QA/PC meetings (Dr. Elkins).
Video lecture by Michael Laposata: Diagnostic Management Team
Be familiar with laboratory reimbursement.

Professionalism
Demonstrate compassion, respect and commitment to your patients.
Be responsive and respectful to your co-workers, including faculty, peers and support staff.
Strictly adhere to confidentiality rules.
Aim to be dependable, punctual and strive for excellence in patient care.

Interpersonal and Communication Skills
Write comprehensive consultative reports.
Provide advice to referring clinicians and other health care providers.
Follow proper documentation practices.
Be able to present your findings independently at interdisciplinary conferences.
Communicate effectively with laboratory personnel.

Key books and online sources:

Tietz Fundamentals of Clinical Chemistry, 6th Ed. Saunders

Protein Electrophoresis in Clinical Diagnosis, ASCP Press

Henry's Clinical Diagnosis and Management by Laboratory Methods, 22nd Ed. Saunders

Tietz Clinical Guide to Laboratory Tests, 4th Ed,Saunders

Color Atlas of Body Fluids, CAP

Fundamentals of Urine and Body Fluids, Saunders

ASCP CASESET, Laboratory Medicine, ASCP Press

Webcasts: AACC - American Association for Clinical Chemistry" <eservices@aacc.org> continuously throughout the year.

CAP Inspection Team Member Training
http://learning.cap.org/catalog/options/view/d9c451f3-addd-4d09-b24a-5b1f83d27a3e

ARUP Testing a Test: Beyond Sensitivity and Specificity
http://www.arup.utah.edu/education/testing_test.php?unique=129561085

ARUP Advising Clinicians on Laboratory Test Selection and Result Interpretation with a Diagnostic Management Team http://www.arup.utah.edu/education/dmt.php

CYTOGENETICS

Length of Rotation: 1 month required

Teaching Staff:
Antony Shrimpton, PhD, Director
Lori Plaisted: Cytogenetics Supervisor
Mickey Muscolino: Assistant Supervisor
Technologists: Lisa Beneway, Marcia Bellinger, Laura Benz, Randy Grimshaw, Stephanie Mazzullo, Karen McKnight, Nicole Stewart, Susan Wixted
Secretary: Cynthia LaFountain

Goals

The resident will gain an appreciation for Medical Genetics, including exposure to standard karyotype analysis, prenatal diagnosis, cancer genetics, molecular cytogenetics (FISH and microarray analysis). The resident will be able to interpret cytogenetic data and correlate the laboratory findings with the diagnosis of inherited disorders and diagnosis and classification of hematologic malignancies, and apply the knowledge in the assessment of prognosis and selection of treatment options.

Objectives

Understand the principles and techniques of karyotype analysis, fluorescence in situ hybridization (FISH), and chromosome SNP microarray. Be familiar with chromosome identification, sample collection and cell culturing. Recognize common abnormalities of hematologic neoplasms and inherited diseases.

Competencies

Patient care

Review cytogenetic findings of hematology cases and incorporate the information into case reports. In the absence of the laboratory director, review and interpret STAT FISH studies and report preliminary findings to the referring oncologist. Consult with clinicians, surgical pathologists and hematopathologists regarding cytogenetic analyses and order tests, when appropriate. Evaluate the necessity of cytogenetic analysis to avoid testing that is not clinically useful. If requested by the cytogenetics director, look up clinical history, physical findings or pathology reports.

Medical Knowledge

Perform all steps of the karyotype protocol including cell harvest, slide preparation, staining, and chromosome interpretation. Recognize the normal chromosome complement and common polymorphic variants. Be familiar with cytogenetic nomenclature. Independently analyze 10-20 unknown cases, interpret the data, and present your results to the attending. Understand the principles of fluorescence in situ hybridization, the types of probes that are used (dual fusion, break-apart, site specific, repeat sequence, centromere and whole chromosome painting probes), and the appropriate applications for each. Understand the pitfalls and advantages of metaphase vs interphase evaluation. Be familiar with the cytogenetic follow-up algorithm of different diseases, including chronic myelogeneous leukemia.

Practice-Based Learning

Understand the evolving genetic concept of the WHO Classification. Consult the literature for novel findings associated with unknown cases before sign-out with the director.

Systems-Based Practice

Understand the overlap between molecular and cytogenetic testing and weigh the advantage of one over the other, when ordering tests. Participate in test development as appropriate.

Professionalism

Arrive on time to scheduled sessions. Treat the laboratory staff with respect. Participate in the weekly Cytogenetics Case Reviews, providing relevant input on the cases being discussed. To serve better the need of patients, work closely with hematologists and pathologists in ordering appropriate cytogenetic tests.

Interpersonal and Communication Skills

Participate in weekly Cytogenetics Case Conferences. Be able to discuss new technologies and treatment options with the laboratory director. Present an in-service to the staff on an area of genetics.

Curriculum

1. The resident will work with a senior technologist to set up a blood culture using standard techniques. He/she will proceed through all steps of the protocol including cell harvest, slide preparation, staining, and chromosome interpretation with guidance from the technical staff.

2. The resident will observe the culture of amniotic fluid, tissue, and bone marrow cells.

3. The resident will observe the technique of fluorescence *in situ* hybridization.

4. The resident will observe the application of the computer assisted karyotyping system.

5. The resident will attend and participate in the weekly Cytogenetics Case conference. In addition, the resident will be given 15-20 unknown cases for analysis. He/she will work up each case, write a sample report, and discuss the findings with the laboratory director.

6. The resident will review the principles of Medical Genetics and be familiar with the principles of cell division, nondisjunction error, imprinting, mutation, and chromosome structure.

7. The resident will present an in-service to the staff on an area of genetics that he/she is interested in. the presentation should be topical and provide both basic and more complex elements of the subject discussed.

Duties/reponsibilities

After having completed the rotation, the resident will be expected to coordinate with the Laboratory staff in obtaining appropriate specimens and clinical information on cases. On weekends, he/she will report FISH results to clinicians.

Methods of Evaluation = assessment by attending

Residents will be evaluated by the Cytogenetics Laboratory director on their base of knowledge during case conferences, their presentation of the unknown case studies, and the in-service presentation. In addition, there will be input on resident's performance in the lab by the Laboratory supervisor and technologists who worked with that resident.

Recommended Reading List

Borgaonkar, Digamber. 1997. Chromosomal Variation in Man: A Catalog of Chromosomal Variants and Anomalies, 8th Edition. Alan R. Liss, Inc.

De Grouchy, Jean and Catherine Turleau. 1984. Clinical Atlas of Human Chromosomes, 2nd Edition. John Wiley and Sons.

Gelehrter, Thomas and Francis Collins. 1998. Principles of Medical Genetics, 2nd Edition. Williams and Wilkins.

Hein, Sverre and Felix Mitelman. 1995. Cancer Cytogenetics, 2nd Edition. Alan R. Liss, Inc.

ISCN 1995, An International System for Human Cytogenetic Nomenclature. S. Karger.

Jaffe, E.S., N.L. Harris, H. Stein, J.W. Vardiman, Eds. 2001. Pathology and Genetics: Tumours of Haematopoietic and Lymphoid Tissues. World Health Organization, IARC Press.

McKusick, Victor. 1998. Mendelian Inheritance in Man: Catalogs of Autosomal Dominant, Autosomal Recessive, and X-linked Phenotypes, 12th Edition. Johns Hopkins Press.

Mitelman, Felix. 1990. Catalog of Chromosome Aberrations in Cancer. Alan R. Liss, Inc.

Rooney, D.E. and B.H. Czepulkowski. 1992. Human Cytogenetics, A Practical Approach, 2nd Edition. IRL Press.

Nussbaum, Robert, Roderick McInness, and Huntington Willard. 2001. Thompson and Thompson - Genetics in Medicine, 6th Edition. W.B. Saunders Co.

Verma, Ram and Arvind Babu. 1995. Human Chromosomes - Manual of Basic Techniques, 2nd Edition. McGraw Hill, Inc.

Hematopathology Rotations

Goals

The goals of the hematopathology rotations are to prepare trainees to evaluate and diagnose benign and malignant hematolymphoid disorders; select appropriate tests in the evaluation of diverse specimen; communicate findings and serve as consultants to clinicians; and provide leadership in the hematology laboratory. Graduates will be prepared for the independent workup of common and moderately complex hematolymphoid cases in community practice or in academic setting and act as a medical director of Hematology in the clinical laboratory.

8-9 months are spent on Hematopathology services that encompass automated hematology, bone marrow and lymph node pathology, flow cytometry and coagulation and hemoglobin studies. There is extensive interaction with expert adult and pediatric hematologists/oncologists. With experience, the trainee will gradually increase his/her responsibility for cases, gain independence and supervise junior residents, but with attending review of all cases and decisions.

Bone Marrow (3 months)

Goals

The resident must recognize normal and abnormal bone marrow morphology, notice subtle morphologic clues and use laboratory test results and ancillary testing to approach differential diagnoses and final diagnoses of bone marrow disorders.

Year-Specific Goals in Bone Marrow

PGY-1 - By the end of the first year the resident:

- Should understand the clinical indications and limitations of bone marrow evaluation.
- Be efficient in the technical aspects of specimen handling and preparation and staining of slides.
- Interpret smears, tissue sections and special stains.
- Understand hematopoiesis and recognize the stages of cell differentiation.
- Recognize normal and dysplastic maturation.
- Be able to distinguish hemolytic anemia from anemia of production failure.
- Understand the diagnostic principles in distinguishing reactive leukocytosis and clonal disorders.
- Be familiar with the major entities in the WHO Classification of hematopoietic neoplasms.

PGY-2 - By the end of the second year the resident:

- Should be familiar with the principles, operation, pitfalls and troubleshooting of automated hematology.
- Understand the pathophysiology and recognize bone marrow morphology of vitamin deficiency anemias, hypoplastic anemias and PNH.
- Recognize bone marrow manifestations of infections and systemic diseases.
- Integrate morphology, flow and genetic data in the differential diagnosis of hematolymphoid neoplasms.

PGY-3 - By the end of the third year the resident:

- Be able to render a final diagnosis of most entities in the WHO Classification of hematopoietic neoplasms.
- Be familiar with inherited and pediatric bone marrow syndromes.
- Recognize common post-therapy findings in the regenerating marrow.

Objectives

The resident must demonstrate knowledge of evolving classification of hematopoietic malignancies; must understand the biologic bases, clinical manifestations and pathology of benign conditions affecting bone marrow function or of other inherited or systemic diseases that manifest in abnormal bone marrow pathology.

Patient Care

The resident will gather relevant information, including clinical history, physical findings and previous biopsy results. He/she will show competence in collecting bone marrow aspirates and biopsies, specimen processing, aspirate smear and touch imprint preparation and Wright-Giemsa staining. The resident will be responsible for description of red cell morphology and estimation of RBC, WBC and platelet count on the peripheral smear. He/she will perform peripheral blood (200-cell) and bone marrow (500-cell) differentials, analyze CBCs, examine and describe all cell lines based on Wright stained slides. The resident must order, evaluate and count cytochemistries, as appropriate and be able to perform basic cytochemical stains such as peroxidase. Biopsies and clot sections are examined and special stains and immunohistochemistries obtained. Ancillary studies are coordinated (cytogenetics, flow cytometry, molecular studies, clinical chemistry, etc.). The trainee writes up a detailed report based on the bone marrow report form, formulates a diagnosis and presents the case to the supervising attending at a multi-headed microscope. Arrangements can be made for trainees to spend elective time at the Regional Oncology Center (outpatient) to see patients and perform bone marrow biopsy procedures if the trainee wishes to do so. Bone marrow aspiration and biopsy procedure are not mandatory.

Medical Knowledge

Diagnostic entities of bone marrow curriculum:

I. Reactive conditions

1. Anemias: iron deficiency, folate/vitamin B12 deficiency, anemia of inflammation, ethanol/drug-induced complex etiology.
2. Polycythemia
3. Leukocytosis, leukemoid reaction.
4. Regenerating bone marrow, post chemotherapy, post-BM transplantation marrow
5. Cytokine effect
6. Infections including parasites, bacterial, viral and fungal infections and HIV.
7. Bone changes in metabolic diseases
8. Bone marrow fibrosis.
9. Bone marrow aplasia.
10. Bone marrow features in thrombocytopenia and thrombocytosis.
11. Bone marrow necrosis

II. Malignant conditions

1. Myeloproliferative neoplasms
2. Overlap myeloproliferative/myelodysplastic syndromes
3. Myelodysplastic syndromes
4. Acute myeloid leukemias
5. Precursor B- and T-cell leukemias/lymphomas
6. Mature B-cell leukemias/lymphomas
7. Mature T- and NK-cell leukemias/lymphomas
8. Post transplantation lymphoproliferative disorder
9. Hodgkin lymphomas
10. Histiocytic and dendritic-cell neoplasms
11. Mastocytosis
12. Metastatic solid tumors

Practice-Based Learning
Use information technology and textbooks to support diagnostic decisions. Understand the role and limitations of ancillary studies in the evaluation of bone marrow disorders. Demonstrate graduated expertise in the evaluation of bone marrow specimen.

Systems-Based Practice
Understand the role and limitations of bone marrow evaluation in the diagnosis of hematolymphoid disorders and demonstrate the ability to utilize alternative diagnostic tools in order to improve hematology and oncology health care.

Professionalism
The trainee will review bone marrow slides in a timely fashion and use his/her judgment to expedite urgent cases. Will notify attending and clinician of new diagnosis of malignancy without delay.

Interpersonal and Communication Skills
Communicate effectively with clinicians. Willingly and actively review slides with clinicians and other trainees. Be able to clearly explain relevant morphologic features and correlation between morphology and laboratory values. Acquire information about symptoms and physical findings from clinicians and nurses, and incorporate these into diagnostic decisions.

Automated Hematology (during PGY-2 BM rotation)
Goals
The resident will be prepared to assume the role of a Medical Director of the Hematology Laboratory; to represent the laboratory to the hospital administration and accrediting agencies; to supervise quality management; and to provide leadership to the laboratory.

Objectives
Learn clinical hematology laboratory operation and management, including methodologies, quality management, troubleshooting, reviewing abnormal blood films and interfacing with clinicians on laboratory problems. Interact with administrative leadership, and participate in inspection. Be involved in external proficiency testing, competency testing, quality assurance, test validation.

Patient care
The resident inspects peripheral blood smears that are submitted for pathologist's review by technical personnel and reviews findings with the technologist, if needed. He/she reviews slides for platelet clumping in case of suspected pseudo thrombocytopenia. The resident identifies abnormal features of white cells in peripheral blood smears, such as Chediak-Higashi syndrome, May-Hegglin, Pelger-Huët and Alder-Reilly anomalies and different red cell poikilocytes. The resident troubleshoots suspicious or unusual blood cell histograms.

Medical Knowledge

Instrumentation and tests:

1. Blood diluting procedures
2. Beckman DxH800
3. Hemoglobinometry
4. Calibration
5. Maintenance of spectrophotometers
6. Phase microscopy and manual platelet counting
7. Centrifuges
8. Microhematocrit
9. ESR Auto-plus

Preparation of reagents

1. Wright's stain
2. Cytochemical methods
3. Blood-diluting fluids
4. Use of anticoagulants: Citrate, Heparin, EDTA
5. Buffer solutions

Hematology procedures

1. Obtaining blood: Capillary, Venous, Various sites
2. Preparation of blood films: slide, coverslip
3. Staining of blood films: Wright's stain, Special stains
4. Reticulocyte
5. Red cell indices
6. Review, interpret blood cell histograms

Quantitative evaluation of laboratory data

1. Quality Control statistics
2. Economics and administration of hematologic laboratory

Practice-Based Learning

Understand the pitfalls of hematology instruments. Demonstrate increasing levels of skill in making management decisions, troubleshooting and supervising the wet hematology.

Systems-Based Practice

Actively participate in the selection process of new instruments. Be familiar with post-analytical procedures, such as reporting, Laboratory Information System, critical values, turn-around time. Participate in QC/QA testing and proficiency testing.

Professionalism

Review cases without delay. Recognize acute cases and critical values and the need to call the clinician immediately.

Interpersonal and Communication Skills

Work effectively with a large staff in the Core Laboratory. Listen to suggestions of staff to improve laboratory services.

Lymph Node/Flow Cytometry (3 months)

Goals

The resident will demonstrate ability to combine cytomorphologic, histologic and immunophenotypic studies and use ancillary techniques to reach a diagnosis of common abnormalities of lymph nodes and related organs.

Year-Specific Goals in Lymph Node/Flow Cytometry

PGY-1 - By the end of the first year the resident:

- Should be familiar with the clinical indications and common procedures of lymph node evaluation.
- Understand normal lymph node and spleen morphology and function.
- Understand clinical indications for flow cytometric evaluation of solid tissue, blood and body fluids.
- Should be familiar with the principles of routine flow cytometry, surface and cytoplasmic markers and detection of hematological clones.

PGY-2 - By the end of the second year the resident:

- Interpret histologic sections of lymph node, order immunohistochemistries with the help of attending and render a preliminary diagnosis in most simple and moderately complex lymphomas.
- Should be familiar with immunophenotypic features of hematolymphoid neoplasms.
- Should be able to choose and interpret flow panels independently.
- Order ancillary testing with help from attending.
- Should understand the principle, significance and methods of evaluation of minimal residual disease.

PGY-3 - By the end of the third year the resident:

- Interpret histologic sections of lymphoid tissues and order immunohistochemistries independently and render a final diagnosis in most simple and complex lymphomas.
- Recognize common reactive lymphadenopathies.
- Order ancillary testing independently.

Objectives

Evaluation of lymph nodes, spleen and tissues other than bone marrow (brain, GI tract, skin, salivary glands, lung, bone are the most common) for involvement by lymphomas, granulocytic sarcomas, and other hematolymphoid malignancies or reactive lymphadenopathies. Integrate morphologic and phenotypic data and incorporate clinical and, if relevant, molecular and cytogenetic data to formulate a diagnosis. The trainee will gain familiarity with the technical aspects of specimen processing, will be aware of the significance of fixatives and of proper specimen handling for ancillary studies. The trainee will understand an algorithmic approach to diagnosis of hematolymphoid neoplasms.

Patient Care

Trainees review all lymph nodes from anatomic pathology in consultation with the AP resident and attending. They are consulted at the time of gross specimen submission regarding processing for paraffin sections, flow cytometry, molecular studies etc. These and all outside consultations, as well as peripheral blood and bone marrow submitted for immunophenotyping are evaluated and described. The trainee selects blocks and specimens and orders flow cytometry, immunohistochemistries, molecular and cytogenetic studies. The trainee then scores each immunohistochemistry, reviews graphs of flow cytometry and generates a report. A diagnosis is made and the case is reviewed with the attending. The resident, when on the service, is responsible for evaluation of all cases. The resident supervises and assists in technical work (processing, staining and obtaining special studies).

Medical Knowledge

Curriculum topics:

I. Benign lymphadenopathies
1. Reactive lymphadenopathies
2. Infectious lymphadenopathies (viral, AIDS, bacterial, mycobacterial, protozoal fungal)
3. Lymphadenopathies associated with clinical symptoms (Kimura, sinus histiocytosis with massive lymphadenopathy, Kikuchi, sarcoid, SLE, RA, dermatopathic lymphadenopathies, Castleman, hemophagocytic syndrome)
4. Iatrogenic lymphadenopathies
5. Vascular lymphadenopathies
6. Foreign body lymphadenopathies

II. Lymphomas and other neoplasms of lymph nodes
1. Hodgkin lymphomas
2. Precursor B and T-cell neoplasms
3. Mature B-cell lymphomas
4. Mature T-cell and NK-cell lymphomas
5. Granulocytic, histiocytic and dendritic-cell neoplasms
6. Mastocytoses
7. Immune deficiency-associated neoplasms

III. Spleen
1. Hypersplenism and hyposplenism
2. Extramedullary hematopoiesis
3. Disorders of the white pulp
4. Disorders of the red pulp
5. Storage diseases
6. Hemophagocytic syndrome
7. Leukemias
8. Lymphomas
9. Systemic mastocytosis
10. Myeloproliferative disorders
11. Vascular lesions
12. Metastatic tumors

Practice-Based Learning

The resident will solve complex cases, perform literature searches, assimilate new findings in their work and seek input from experts.

Systems-Based Practice

The trainee will show sophistication in the appropriate and cost effective choice of laboratory tests for a given clinical situation. The resident will communicate with clinicians to make clinico-pathological correlations in their cases. In the weekly Hematology/Hematopathology Conference, there will be a systematic communication between hematologists and pathologists about new therapies, new biological markers and diagnostic guidelines emerging in the field of Hematology. The resident might be asked to present at these discussions. The resident will participate, along the Laboratory Director, in regular meetings of the Flow Cytometry Laboratory to discuss clinical effectiveness and laboratory management issues (reimbursement, work-flow, personnel).

Professionalism

The resident will show adherence to principles of medical ethics, confidentiality and must always serve the interest of patients.

Interpersonal and Communication Skills
The trainee will work closely with flow cytometry technologists. Based on preliminary flow results, the resident will, in collaboration with the flow technologist, design unique marker combinations and choose fluorochromes. He/she will present cases in patient care conferences and discuss patient management with clinicians. The trainee will communicate with submitting physicians and pathologists regarding history, findings and concerns, communicate preliminary results and, with increasing experience, final results.

Special Hematology (2 weeks, PGY-1)
Special Hematology/Clinical Chemistry Combined Rotation (1 month, PGY-2/3/4)

Goals
The resident will be able to identify major thalassemia syndromes and hemoglobinopathies and their interactions. The resident will understand indications for thrombophilia/bleeding evaluation; will have current knowledge of drug monitoring of antiplatelet and antithrombotic drugs; will demonstrate a thorough understanding of coagulation screening tests and will be able to diagnose inherited and acquired coagulation deficiencies and thrombophilias.

Graduated Responsibility
In their first year, residents focus on initial reading and bench duties, described below. Residents in their PGY2 and PGY3 years, will act as Laboratory Directors: they will participate in section meetings, continually review QA/QC data analysis and revise at least one laboratory procedure that is chosen by the Laboratory Director, Dr. Banki. Residents are responsible for initial reporting of proficiency tests by CAP or NYS.

Objectives
Understand the pathomechanism of common red cell and hemostasis disorders. Be familiar with the preanalytical phase (including sample stability) and the performance characteristics of laboratory methods used in the diagnosis of thalassemia and hemoglobin disorders, hemolytic anemias and thrombotic and hemorrhagic disorders. Interpret routine test results and utilize algorithmic approach in the workup of abnormal PTT and PT results. Interpret platelet aggregation and secretion, lupus anticoagulant and von Willebrand factor results. Integrate patient's history, clinical symptoms and laboratory data to reach a diagnosis or differential diagnosis and be able to advise the clinician about the significance of your findings.

Patient Care
The trainee will coordinate the entire hemostasis/red cell disorder consultation, in conjunction with the attending pathologist. This includes initially assessing history from the patient and/or referring physician and formulating a testing strategy including making alterations of the test strategy based on unanticipated results, organization of the test results, and finalization of a report, and often direct communication back to the referring physician. Residents interpret platelet aggregation and secretion studies and von Willebrand factor analysis. Residents summarize laboratory evidence of bleeding and thrombotic disorders. Trainee interprets results in the setting of anticoagulant/antiplatelet therapy; counsels clinicians about drug monitoring. The trainee reviews the peripheral smear, red cell indices, HPLC and electrophoretic separation of hemoglobin, RBC enzyme, and all other specialized assays (Sickledex, osmotic fragility, HbH prep). The resident will utilize laboratory findings (serum iron, enzyme, and bilirubin) in the investigation of anemias.

Medical Knowledge
Tests and Instrumentation:
Red cell procedures.

1. Osmotic fragility
2. Autohemolysis
3. Sickling determinations
4. Hemoglobin electrophoresis - alkaline electrophoresis, acid electrophoresis, isoelectric focusing
5. G6PD; screening and quantitative
6. Unstable hemoglobin: heat denaturation; isopropanol solubility
7. HPLC analysis of hemoglobin Hemoglobin A_2 and F estimation)
8. Acid elution: Kleihauer-Betke assay (Fetal hemoglobin)
9. Heinz body preparation
10. Hemoglobin H preparation (brilliant cresyl blue)

Coagulation and Platelet Procedures.

1. Obtaining blood (special techniques, such as two syringe technique)
2. Partial thromboplastin time, Thrombin time, One-stage prothrombin time
3. Platelet aggregation and release reaction studies; impedance aggregometry
4. Clot retraction
5. Procoagulant factor assays
6. Fibrinolysis - Euglobulin lysis time
7. Test for fibrin degradation: D-dimer
8. Fibrinogen assay
9. Lupus anticoagulant test battery
10. Factor VIII and IX inhibitors (Bethesda assay)
11. PFA-100
12. von Willebrand Factor; Antigen and Ristocetin cofactor
13. Activated Protein C resistance
14. Factor XIII screening test (urea solubility)
15. Chromogenic assays - Protein C activity, Antithrombin III activity, Heparin levels, etc.

Practice-Based Learning
The trainee actively compares any unusual patient result with basic science and medical literature in the process of writing up the case. The resident will recognize the need to monitor new antithrombotic drugs and actively participates in the fast-developing field of drug monitoring methods. The resident will attend monthly meetings of the University Hospital Anticoagulation Committee along with Dr. Banki.

Systems-Based Practice
The trainee will show sophistication in the appropriate choice of laboratory tests for a given clinical situation. The resident will recognize common combination of hemoglobinopathies and thalassemia syndromes among immigrant populations. See also graduated responsibilities.

Professionalism
The resident will show adherence to principles of medical ethics, confidentiality and must always serve the interest of patients.

Interpersonal and Communication Skills
The resident will work with Special Hematology technologists and attending pathologist to determine the appropriate tests to be performed, then will inform clinicians about possible testing routes, appropriate test ordering and specimen requirements. The resident will serve as an effective consultant in cases of thrombotic and bleeding diatheses.

Special Heme Rotation-Duties

1. Stop by at the lab at 9 am and inquire about problems
2. Analyze complex patients, identified by Vicky Mize
3. Interview patients with attending
4. Write up SH cases and sign out with attendings (turnaround time is one day after tests have been done)
5. Contact physicians, when asked by lab personnel.
6. Give a 30 minutes-long inservice to core lab (topic discussed with attending)
7. Hematology instrumentation (Dr. Hutchison and Stephen Gwilt, Core Lab), second and third-year residents only.
8. Solve unknown cases: Write a full diagnosis, as written in regular reports, including comments, notes etc. Finish at least 50 cases. Discuss with the attending, if difficult, preferably in the morning.
9. In case you cannot cover the service, arrange for coverage and notify the lab about the change
10. Bench duties: Read procedure notes in lab manual, before observing/performing procedure. Technologists will initial that the procedure has been observed/performed.
    - Measure serum viscosity _____
    - Observe platelet function test, including preparation of PRP _____
    - Run one agonist, after patient's testing is done. _____
    - Observe PTT and PT testing _____
    - Perform PT/PTT under supervision _____
    - Observe factor testing. Understand calibration curve _____
    - Observe LA testing _____
    - Observe AT, Protein C or Protein S testing _____
    - Watch testing of HIT _____
    - Observe osmotic fragility test, plot data _____
    - Observe Hb electrophoresis procedure _____
    - Observe Hb HPLC _____
    - Perform one Hb HPLC under supervision _____
    - Calculate Bethesda (raw measurements provided) _____
    - Calculate factor activity (raw data provided) _____

Key Books: Coag and platelet chapters in Henry's book (these are excellent)
CAP: An Algorithmic Approach to Hemostasis Testing (except first 2 chapters)
Laboratory Methods Chapter in Hemostasis in Thrombosis and Hemorrhage (pp. 363-410)
The Thalassemia Syndromes by Weatherall and Clegg; needed in any thalassemia case
Bunn-Forget: Hemoglobin (copied chapters in binder in resident room)
Disorders of hemoglobin (excellent for sickling disorders)
Hemoglobin chapter in Henry's book

Case Studies: practical hemostasis.com - solve practice questions
pathquestions.com - solve all hemostasis questions
ASCP Laboratory Medicine Caseset
CAP Color Atlas of Hemoglobin Disorders
Variant hemoglobins (Wiley-Blackwell)

Bone Marrow and Blood Morphologic Studies (3 months)

Teaching and Technical Supervisor: *Teresa Futia-Marra, MT(ASCP) SH*

Duties/Responsibilities

Read bone marrows. Perform differential counts of PB (200 cells, new heme case; 100 cells, repeat on metastatic disease) and BM (500 cells or 300 cells). Review all slides; write up the report of the marrow and blood in detail. Review and sign out the cases with the clinical pathologist on service. Read regularly in the recommended references and current literature about the cases you see and the questions that arise.

Be sure the marrow is scanned on the same day it comes in, and that any obvious significant findings are confirmed by the attending pathologist and are reported to the patient's resident or attending physician.

The marrow biopsy sections ordinarily will be ready one day after the marrow is obtained. Look at all the sections when they come in. Write a description and incorporate it in the marrow report for reviewing with the attending.

Flow cytometry and sometimes cytochemistries (when needed) are performed as a part of the workup of new patients with hematologic neoplasms. Interpretation of flow cytometry is included in the report. Graphs are reviewed and percent positive cells are tallied by the software program. Adjust gates and thresholds as appropriate. The results should be incorporated in the marrow reported.

Cytogenetic, FISH and molecular assays should be ordered as appropriate. Results of molecular tests are included as procedures in the report. Those, and results of cytogenetic studies, are to be noted in addendum reports if morphology and flow are signed out prior to their completion.

Promptly proofread and sign both preliminary and final reports. Unless special studies entail a delay, the report should go out on the second day after the specimen was obtained.

Learn preparation and staining of films, preparation of paraffin sections, and touch imprint techniques.

Learn and perform bone marrow aspiration and biopsy procedures (at least 3) through arrangement with the Clinical Hematology team and Attending Clinical Hematologist on service.

On weekends and holidays (when on-call) and during the week (when on the Bone Marrow Service) look at abnormal or difficult blood films from the Clinical Pathology Core Laboratory in order to check the results of the technologist, as requested. Confirm your impressions with the Hematopathology Fellow, and with the attending pathologist, if necessary. Contact the physician, if appropriate.

Read peripheral blood films (teaching slides or of diagnostic importance) that are accessioned with the bone marrow specimens. These reports are written up on a form similar to the bone marrow report and should be treated in the same fashion.

Become credentialed in the myeloperoxidase procedure. For the neutrophil alkaline phosphatase (NAP) assay, perform a count of the cells and compare with that of the technologist's. When signing out subsequent NAPs, look at the films to get your impression of the results and validity of procedure.

Attend and participate in hematology conferences. For the Tuesday conference, present cases and appropriate review of the topic, as assigned by the attending pathologist in charge of the conference. For the Thursday conferences with the clinical hematologists, prepare your cases with the assistance of the attending pathologist, and present them at the conference.

Be available for presentation of case studies and lectures to medical technology students and hematology staff.

Develop a working knowledge of immunoglobulin and T-cell receptor gene rearrangements and assays for the molecular abnormalities as applicable to the diagnosis of hematopoietic neoplasms.

Develop a working knowledge of cytogenetic abnormalities in leukemias and lymphomas, e.g., t(8;21), t(15;17), t(9;22), t(8;14), t(8;22), t(2;8), t(4;11), t(1;19), t(11;14), inv16, tris12, t(2;5), and t(14;18), etc.

Special Hematology Rotation (1.5 months)
Teaching Supervisor: Vicky Mize, MT(ASCP) SH,C

Duties/Responsibilities
Become credentialed to take histories on all referral patients on our consultation service. Select studies most appropriate to evaluate the patient's disorder. Before the patient leaves, review the history and proposed tests with the attending pathologist.

Hemostasis evaluations: Work with the technologists and attending pathologist to determine the appropriate tests to be performed. Sign out interpretation with attending pathologist and contact referring physician to discuss future diagnostic and followup testing and proper therapy.

Hemoglobin/thalassemia evaluations: Work with the technologists to determine the appropriate tests to be performed. Check the Wright-stained blood films. Procure further clinical information as indicated. Write interpretation and sign out with the attending pathologist.

Osmotic fragility determinations: Work with the technologists to determine the appropriateness of an osmotic fragility determination, in consideration of the clinical history and, if available, the peripheral blood film. Write interpretation and sign-out with the attending pathologist.

Become familiar with all procedures. These include instrument checks, calibration and quality control. During the month that this rotation is combined with the rotation in Clinical Chemistry, the resident will spend one week focusing not only upon testing performed in the special testing section, but also upon testing performed with high volume and more automated instrumentation.

Instrumentation (principles and maintenance)

- Blood diluting procedures
- Abbott Cell-Dyne 4000
- Diagnostica Stago. STA Coagulation Instrument
- Hemoglobinometry
- Calibration
- Maintenance of spectrophotometers
- Phase microscopy and platelet counting
- Centrifuges
- Standard
- Microhematocrit
- Platelet lumi-aggregometer and whole blood aggregometer
- Beckman and Sebia electrophoresis apparati
  Isoelectric focusing apparatus
- Bio variant HPLC apparatus

Preparation of reagents

- Wright's stain
- Cytochemical methods
- Blood-diluting fluids
- Use of anticoagulants: Citrate, Heparin, EDTA
- Buffer solutions

Quantitative evaluation of laboratory data

- Quality Control statistics
- Economics and administration of hematologic laboratory

Hematologic procedures.

- Obtaining blood: Capillary, Venous, Various sites
- Counting of erythrocytes: Abbott Cell Dyne
- Preparation of blood films: slide, coverslip
- Staining of blood films: Wright's stain, Special stains
- Reticulocyte
- Platelet counts:
- Hematocrit: micro, Abbott Cell Dyne
- Red cell indices
- Review, interpret blood cell histograms
- Westergren Sedimentation rates (ESR)
- Automated erythrocyte sedimentation rate (Vesmatic)
- Eosinophil counts
- Osmotic fragility of erythrocytes
- Autohemolysis
- Sickling determinations
- Hemoglobin electrophoresis - alkaline electrophoresis, acid electrophoresis, isoelectric focusing
- Sucrose hemolysis test
- Acid serum hemolysis test
- G-6PD screening tests and assay
- Unstable hemoglobin: heat denaturation; isopropanol solubility
- Hemoglobin A_2 assay (this is a part of the HPLC method - no manual method
- Acid elution (fetal hemoglobin)
- Heinz body preparation
- Hemoglobin H Preparation (brilliant cresyl blue)

Coagulation and Platelet Procedures.

- Obtaining blood (special techniques, such as two syringe technique)
- Bleeding time - Simplate II
- Partial thromboplastin time, Thrombin time, One-stage prothrombin time
- Platelet aggregation and release reaction studies; impedance aggregometry
- Clot retraction
- Platelet count
- Procoagulant factor assays
- Fibrinolysis - Euglobulin lysis time
- Screening Test for fibrin degradation products: D-dimer tests
- Fibrinogen assay
- Circulating inhibitors - Lupus-anticoagulant test battery
  - Factor VIII inhibitor (Bethesda)
- PFA-100
- von Willebrand Factor Antigen, Activated Protein C resistance
- Ristocetin cofactor
- Factor XIII screening test (urea solubility)
- Chromogenic assays - Protein C activity, Antithrombin III activity Heparin levels, etc.

HEMATOLOGY, ABNORMAL RESULTS STANDARD OPERATING PROCEDURE

The Hematology technical staff will call the patient's physician immediately to report any of the following:

Hematocrit	< 25 or > 55%
WBC	< 2 x 10^3/_L or > 30 x 10^3/_L
Platelet	< 50 x 10^3/_L or > 1000 x 10^3/_L
Prothrombin time	> 30 sec
Partial Thromboplastin time	> 90 sec
Thrombin Time	> 40 sec

Unexpected differential findings, including blasts in a new patient or leukemic patient in supposed remission will also be called. These findings will be confirmed with the Hematology Supervisor, the Clinical Pathology Bone Marrow Resident (or resident on-call), or the Attending Pathologist.

In the case of a clinically important unexpected finding (such as blast cells in a new patient suggesting the diagnosis of leukemia), the Hematology Supervisor will consult the Clinical Pathology Bone Marrow resident. The resident will confirm the finding, checking with the hematopathology fellow or attending pathologist as necessary, and call the clinical physician to report the finding and inform the clinician of its implications.

Hematopathology Consultation and Flow Cytometry Service Rotation (3 months):

Teaching and Technical Supervisors: *Theresa Haven, BS, Immunology and Flow Cytometry, Donna Barrett (Processing), Julie Lippa (Immuno-histochemistry),*

Objectives

The primary objective of this rotation is for the residents to learn the roles of modern immunophenotypic studies in the diagnosis and classification of leukemias and lymphomas and the skills of morphologic diagnosis in hematologic tissues. All residents should acquire a foundation, which will allow them to handle difficult hematopathology problems in an appropriate fashion. Those with particular interest have opportunities to gain experience with new and evolving technologies as well.

Duties/Responsibilities

Screen incoming cases by reviewing a Wright-Giemsa or H & E stained slide and see that cell counts are performed on blood and cell suspensions.

Evaluate cases, including those submitted for morphologic evaluation only for the need for additional studies such as gene rearrangements, cytogenetics or additional markers and communicate these to the referring pathologist or clinician. Request appropriate studies and ensure that the correct materials are transported to the specialized laboratory (Molecular Pathology, Cytogenetics, etc.).

For cases submitted for flow cytometry, appropriately note on the flow cytometry accession sheet the type of disease in question and select the appropriate antibody panel (i.e., acute leukemia, lymphoma, screening, MDS, myeloma). Assist in selection of gates. Review graphs of multi-labeled flow cytometric antibody results, assess appropriateness of gates and describe results. Percent positive cells are tallied by the software program. Adjust gates and thresholds as appropriate. The results should be incorporated in the marrow reported.

Interpret lymph node and related tissue biopsies. Write a microscopic description of H&E morphology. Select appropriate antibodies and blocks for immunochemistry. Quantitate each antibody stain performed on sections and/or cytopreps.

For cases in consultation from Surgical Pathology, which have been previously written up, review morphology and present the findings to the hematopathology attending. Contact surgical pathologists by phone if significant alterations are made in the report.

For cases on which molecular diagnostic tests are performed, review the pathology slides and data and results of molecular testing. Write an interpretive report and present to the Hematopathology attending. Write any appropriate addendum to previously issued Hematopathology or Bone Marrow reports, also for review by the attending pathologist.

Cytogenetic, FISH and molecular assays should be ordered as appropriate. Results of molecular tests are included as procedures in the report. Those, and results of cytogenetic studies, are to be noted in addendum reports if morphology and flow are signed out prior to their completion.

Learn technical aspects of processing lymph node, bone marrow and blood specimens for immunologic markers and related studies (including cultures, molecular studies and cytogenetics). Learn how to prioritize small-sample processing for optimal case-specific studies. Residents are encouraged to process control materials through entire technical procedures.

Utilize and contribute to lymphoma glass slide study sets.

Attend Hematopathology conferences and present cases at Thursday Hematology/Oncology conferences.

Participate in leukemia or lymphoma protocol reviews as indicated by the attending pathologist.

Read regularly in the recommended references and current literature about the cases you see and the questions that arise.

IMMUNOLOGY AND FLOW CYTOMETRY

Length of rotation: One month required.

Teaching Staff:
Elizabeth Ruckdeschel, MD – Director of Flow Cytometry
Sylva Bem, MD – Director of Clinical Immunology
Theresa Haven, BS – Supervisor Immunology/Flow Cytometry Laboratory

A one-month rotation in Immunology/Flow Cytometry is part of the resident's core curriculum and should be accomplished in the 1st, year of training. A second rotation is available for those desiring addition advanced training, or as remediation after unsuccessful completion of the first rotation.

During this rotation, residents are expected to familiarize themselves with the principles and performance of, and gain practical experience in the use of, techniques and interpretation of currently performed serological and immunodiagnostic tests, and in the management of an immunology and or flow cytometry laboratory. Residents will also learn basic principles of immunopathology through participation in signing out of clinical laboratory immunological tests.

Goals

The goals of the clinical immunology flow cytometry rotation are:

- Acquire a base of knowledge, skills, experience and understanding of the principles and applications of methods used in contemporary clinical testing involving immunology testing applied to microbial infections, rheumatological/autoimmunity, immunodeficiency, and related disorders.

- Attain competency in the science and practice of immunology through exposure to the process of applying and interpreting data generated by tests of immunological function.

- Acquire the skills, knowledge and understanding of the technical and performance limitations and potential pitfalls inherent in the methodologies employed so as to avoid pitfalls in misinterpretation.

- Acquire sufficient skills, knowledge and understanding of the process of setting up immunology testing, including validation, regulatory and statistical requirements.

Objectives

Patient Care

The resident must demonstrate a satisfactory level of understanding and diagnostic competence. The resident is expected to provide a level of patient care appropriate to the level of this or her training.

1. By the end of the rotation residents should be comfortable in their ability to interpret results generated using immunopathology techniques used in clinical laboratory testing, including:
    a. Clinical Immunology
        (1) Antinuclear antibody and ANCA analysis
        (2) Hepatitis serology
        (3) Immunodeficiency syndromes
        (4) Fetal defect markers
        (5) Infectious disease serology
        (6) Rheumatologic disease markers
    b. Flow Cytometric Immune Cell Enumeration
        (1) HIV monitoring
        (2) Stem cell enumeration
        (3) Malignant leukocyte immunophenotyping
    c. Renal Pathology/Immunology
        (1) Diagnostic tissue for rejection, rheumatologic cases
2. Be able to develop a general approach for implementing and validating immunopathology assays for clinical service work meeting Federal and State regulatory requirements.
3. Understand and the develop the ability to apply the principles and techniques involved in the Clinical Immunology Diagnostics Laboratory (Luminex, direct and indirect immunofluorescence, flow cytometry, ELISA, agglutination, complement analysis and others).

Responsibilities:

1. Read general texts on immunopathology.
2. Familiarize themselves with the principles, tests and equipment. Review immunopathology pathology PowerPoint presentations and take accompanying tests.
3. Perform a direct and indirect immunofluorescence test for analysis for a disease or autoimmune condition on a biological sample.

4. Spend time with the directors to learn the concepts of immunopathology.
5. Review past cases and evaluate, make preliminary interpretation and present sign-outs to the attending - during the second half of their rotation.
6. To become sufficiently knowledgeable about all tests performed by the section so as to provide consultative activities by discussing appropriate testing with referring clinicians.
7. Learn how to set up and perform unassisted a simple flow cytometry assay using one of the flow cytometers in the laboratory.
8. Work with the technologists within the laboratory at the bench level.
9. Read ANA and ANCA slides with the technologists and laboratory director. Follow-up with any unusual cases.
10. Work with Dr. Tatum and sign out the renal cases on an as needed basis.
11. Research and present at staff meeting, either an interesting case or a potential test for consideration for addition to the service.

Typical Rotation Schedule
Week One: Rotate in Clinical Immunology
Week Two: Rotate in Clinical Immunology
Week Three: Rotate in Flow Cytometry
Week Four: Rotate in Flow Cytometry
Week Five: Rotate in Areas Missed or Needing Additional Work

At the end of this rotation, the resident is expected to:

- Be able to interpret clinical immunology and flow cytometry data.

Medical Knowledge
The resident will demonstrate knowledge about established and evolving diagnostic laboratory practice by developing proper diagnoses and by application of new knowledge. Application of new knowledge will be evaluated by the interactions between the resident and attendings and/or support staff.

The resident is expected to:

- Demonstrate an analytical and problem solving approach to clinical immunological and flow cytometric problems.
- Be able to evaluate basic science principals and clinically supportive data appropriate for the level of training.

Practice-Based Learning and Improvement
The resident will demonstrate the ability to investigate complex cases, evaluate sometimes conflicting test results, and assimilate evolving scientific evidence and provide consultative services. These efforts are crucial to providing a continual of patient care improvement. In solving complex cases, we expect that residents will perform literature searches, assimilate new findings in their work, seek input from experts when required, and share these finding with others. The resident is expected to effectively manage their time and to contribute to scholarly activity through literature searches, journal clubs, case studies and research projects.

The resident is expected to:

- Identify current gaps in knowledge and utilize resources and technologies to improve patient care.
- Integrate and apply best evidence including current research in patient-oriented care.

Interpersonal and Communication Skills
Professional interpersonal interaction and communication is paramount to a successful professional, the resident will demonstrate effective, respectful, and professional communication with all technologists, support staff, and attendings. These interactions will be evaluated by faculty observation of resident performance on individual cases and his or her interactions within the laboratory. The resident is expected to interact with fellow residents, the Chief Residents, the attendings, technicians, and other health care providers. The resident will present cases in conferences and discuss patient management with other health care providers.

The resident is expected to:

- Acquire a technical vocabulary that is essential to effective communication with other professionals.
- Communicate effectively and establish rapport with other health professionals.
- Provide timely, clear and accurate written and oral information about patients to other healthcare professionals.

Professionalism
The resident must demonstrate a commitment to medical ethics, protection of patient confidentiality, be sensitivity to diverse patient populations, and accept professional responsibilities. Completing assignments in a timely manner, being and recognizing the importance of confidentiality in medical practice are always monitored within and outside of the Department of Pathology.

Advanced planning is required and residents requesting time off during this rotation must make these arrangements well in advanced. The general expectation is that the resident will spend a minimum of three continuous weeks in this rotation.

At the conclusion of this rotation, the resident is expected to have:

- Demonstrated professional responsibility by exhibiting behaviors consistent with the profession's expectations.
- Demonstrated professional responsibility through compliance with regulatory requirements of the University, State and profession.

Systems-Based Practice
A major goal is that the resident gain a sophisticated understanding of the appropriate choice of laboratory tests for a given clinical situation.

While the attainment of technical proficiency in laboratory procedures is not a specific objective of the initial rotation, development of sufficient familiarity is required such that the resident can appreciate the intrinsic limitations of the procedures, as well as recognize unlikely individual test results that might reflect technical artifact or laboratory error.

During these rotations, the resident should also evaluate the current quality control procedures in the Clinical Immunology/Flow Cytometry laboratories.

In order to maximize achievement of these objectives, residents are strongly advised to establish close working relationships with technologists and supervisors in the laboratories, a number of whom are truly expert in the field.

The resident is expected to:

- Analyze opportunities for cost effectiveness in medical practice.
- Identify systems and methodology to ensure patient safety and quality improvement in health care delivery.

Graduated Responsibility in This Section: As residents become more familiar with the tests, they are better able to help assess the selection of appropriate immunopathology testing. A second rotation elective is available and involves the research evaluation and adoption of new immunopathology diagnostic tests, or can be used to acquire additional skills.

Curriculum

Clinical Immunology Diagnostic Laboratory:
Luminex specific ANA analysis, immune cell immunofluorescence (ANA, ANCA, tissue specific autoantibodies), ELISA (viral and auto-immune conditions), cold agglutinin and cryoglobulin analysis.

Didactic Lecture Series
Residents should review the immunopathology PowerPoint lectures.

Wet Lab
Residents will perform hands-on manual direct and indirect Immunofluorescence testing. Set up and analyze other clinical specimens.

Clinical Flow Cytometry Diagnostic Laboratory:
Stem cell analysis, lymphocyte subset, leukocyte typing.

Didactic Lecture Series
Residents should review the PowerPoint lectures. Read introductory flow cytometry texts.

Wet Lab
Residents will perform hands-on testing and flow cytometric immune cell enumeration.

Core Immunopathology Pathology Rotation
Throughout the Core Immunopathology pathology rotation, the resident will attend the following meetings/conferences:

Clinical Pathology Weekly Rounds, CP Conference Room, Mondays at 11:00 a.m.
Clinical Pathology Conference II 8:00 AM, Wednesday morning.
Renal Pathology Conference, 4:00 PM second Tuesday of the month.
Renal Pathology Sign-outs as directed by the Director.

The resident should also arrange to meet (usually in the afternoons) with the Immunopathology Pathologist on service each day to review clinical and anatomical cases. The resident needs to preview these cases in the first part of the rotation, but in the latter half of the rotation (depending on the resident's proficiency) the resident should arrange to receive and preview these cases prior to looking at them with the Immunopathologist.

Method of Evaluation

Global Rating of Performance During the Rotation: The rater judges general categories of ability (patient care skills, medical knowledge, interpersonal communication skills, professionalism, systems based practice) and the ratings are completed retrospectively based on general impressions collected over a period of time (end of rotation) derived from multiple sources of information (direct observations or interactions); input from other faculty, laboratory technologists and other residents and review of work products or written materials. Unsuccessful rotations will require remediation.

Laboratory Management

Length of rotation: 1 month mandatory rotation.

Teaching Faculty:
Matthew Elkins, MD, PhD – Director of Rotation
Robert Corona, DO, MBA

Goals

The main goal of this rotation is to provide residents with a basic exposure to the diverse aspects and challenges inherent in a laboratory management position in pathology. These aspects include informatics, management strategies, laboratory finance, test validation and technologist competency, lab test evaluation and implementation, bioethics, and regulations.

Objectives

The residents will acquire a base of knowledge and skills requisite for a pathology career including laboratory management. This knowledge base will be gained through a combination of didactic/interactive presentations, readings/web-based resources, and first-hand experience of laboratory management.

Resident would achieve this objective by becoming familiar with and competent in the following:

1. Management theory including management strategies, emotional intelligence, interpersonal communication skills, business plan formation, and differentiating leadership and management roles.

2. Interactions with hospital administration, clinical departments at Upstate, outside academic institutions, and industrial partners.

3. Research and clinical ethics.

4. Personnel management including recruitment, interviewing, and performance evaluations.

5. Regulatory agencies, regulations as they affect clinical laboratories, and reimbursement.

6. Quality systems including quality control, assurance, and improvement.

7. Information technologies including hardware, software, organization, and utilization.

8. Risk management including contracts and negotiations, legal process, and regulatory compliance.

9. Evaluation of hospital and laboratory resource utilization.

The above requirements and expectations as well as opportunities for resident instruction and involvement beyond these requirements will be reviewed with each resident during their first few days of the 1 month rotation. Self-study is a significant component of the rotation and will be followed up by staff.

Curriculum

The majority of the didactic portion of this rotation will be provided over a 2-year cycle of lectures at the 8 am lecture slot for all residents (thus, all residents will have 2 opportunities to attend a given lecture on one of the topics listed above). The remainder of the instruction will be performed in a single month during the mandatory rotation in the resident's final year of residency. An additional month for an elective rotation is also allowed, at the discretion of the Laboratory Management rotation director. Up to 2 resident positions are available per month. The amount of time allowed off service for vacation/comp time is limited to a maximum of 1 week for each resident during the 1 month rotation. Consideration will be given to residents participating in meetings.

Didactic presentations: Twelve 1-hour lecture/interactive presentations will be given at the 8am lecture time slot over the course of 2 years. These lectures will be given by either Pathology department staff or invited speakers from outside the department. Attendance at these lectures will be counted within the expected 85% attendance rate of the other 8am daily lectures.

During the 1-month rotation, additional small group presentations and interactions will be provided with either pathology faculty or lab managers to cover topics more easily discussed in a small group setting (e.g. performance evaluations, test evaluation).

Projects: During the 1 month rotation, residents will work with the rotation director and laboratory managers to identify a test or process within the lab purview which has recently been brought on-line or is being considered to be brought on-line in the Upstate laboratory. The resident will then use the information gained from the above lectures and resources made available by the lab manager and rotation director to evaluate whether the test should be brought on-line or the procedural change should be made. The resident will consider financial, logistic, information technology, and clinical constraints/needs for this test/process change.

The resident will also work with the lab managers and rotation director to perform a mock inspection of one of the areas of a clinical lab, using either NYS inspection standards or CAP inspection guidelines. As part of this experience, the resident will review at least one recent inspection findings summation with the rotation director.

Management Conferences: During the 1 month rotation, the residents will attend the Pathology QA meeting, Transfusion committee meeting (if scheduled during that month), and gain exposure to relevant hospital administration meetings occurring during the rotation (e.g. hospital finance meeting with Dr. Corona).

Required Reading List

1. Wagar EA, Horowitz RE, Siegal GP. 2011 Laboratory Administration for Pathologists, CAP Press, chapters 1-3, 7

Recommended Reading List

1. Wagar EA, Horowitz RE, Siegal GP. 2011 Laboratory Administration for Pathologists, CAP Press, chapters 4-6, 8-14
2. Valenstein P, ed. 2005 Quality Management in Clinical Laboratories, CAP Press
3. Otte KK, Zehe SC, Wood Aj, Herandez JS, Karon BS. 2009 Legal aspects of laboratory medicine and pathology for residents and fellows. Arch Pathol Lab Med 134:1029-32
4. Pantanowitz L, Henricks WH, Beckwith BA. 2007. Medical laboratory informatics. Clin Lab Med 27: 823-43

Duties and Responsibilities

Increment - 1 month

The resident will be responsible for working with the Laboratory Management rotation director and clinical laboratory managers to identify a worthwhile test/process for the resident to focus on during the month rotation. The resident will be expected to evaluate the chosen test/process using on its financial, clinical, and logistical merits. The resident will then prepare and present the data and his/her conclusions to the rotation director, laboratory manager, and the division manager for the section which would be affected by the test/process change. If the test/process change has merit, the resident may choose to participate with the laboratory director and division manager in the subsequent process to bring the test on-line.
The resident will also be required to participate as a mock-inspector for one portion a clinical laboratory, using either NYS or CAP inspection guidelines, including a debriefing/summation session with the laboratory division manager and the Laboratory Management rotation director.
The resident will also be required to attend small group discussions during the 1-month rotation with the laboratory manager, laboratory division manager, and Laboratory Management rotation director. These discussions will focus on those topics not covered in the didactics portion of the rotation (see above). These discussions will be scheduled at the convenience of the resident, staff, and faculty.

Method of Evaluation
Residents must develop competencies in the six areas below to the level expected of a new practitioner.

Patient Care
Residents must demonstrate understanding of how patient care is affected by laboratory practices through their analysis of the chosen laboratory test/process change.

Medical Knowledge
The resident's medical knowledge will be demonstrated through the evaluation of the chosen test/process change and through the mock inspection.

Practice-based learning and improvement
Resident must be able to research the scientific merit, cost, and logistics for the chosen test/process change, and use that knowledge to form a coherent and reasonable assessment.

Interpersonal and communication skills
The resident must be able to effectively communicate during the course of the mock inspection, including the summation/debriefing session, and in the presentation of the resident's assessment of the chosen test/process change.

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

Systems based practice
The residents shall be able to assess a proposed additional test or procedural change within a laboratory system. They will also gain an appreciation of the interaction between the pathology department and the non-pathology components of the Upstate University Hospital health system.

CLINICAL MICROBIOLOGY

Length of Rotation: 2 months required.

Faculty:
Scott Riddell, PhD, MT(ASCP), D(ABMM) - Director
Soma Sanyal, MD - Assistant Director

GENERAL STATEMENT OF GOALS:

The major objectives of the training rotation in Clinical Microbiology are to provide residents with experience in 1) the detection, isolation, and identification of medically important microorganisms and 2) the interpretation and application of microbiology laboratory results. The rotation is designed so that the resident receives hands-on experience in each of the various microbiology disciplines in order to gain the scientific knowledge, bench-level skills, and other resources necessary to understand the operation of a clinical microbiology laboratory. The later stages of the rotation serve to complete, expand, and solidify the resident's knowledge base in diagnostic microbiology and to expose and involve the resident in laboratory management practice, including the methods used for quality control and quality assurance. By providing residents with increasing responsibilities and duties, as their training progresses, the teaching faculty intends to equip the resident with the knowledge, skills, and abilities necessary to successfully direct a clinical microbiology service.

OVERVIEW OF THE TWO MONTH ROTATION

A. Rotate through the routine sections of the laboratory (schedule will be prepared in consultation with the laboratory supervisor and directors). A typical schedule is as follows:
   a. Bacteriology 4 wks
   b. Virology 1 wk
   c. Mycobacteriology 1 wk
   d. Mycology/Parasitology 1 wk
   e. Makeup/Review 1 wk

B. Attend and participate in the following activities:

Activity	Day/Time	Place
Infectious Disease Lab Rounds	Wed, Fri 1:30 pm	UH 3808
Infectious Disease Grand Rounds	Tue, 12:00 pm (Sept-Jun)	Setnor 2510
Infection Control Committee Meeting	Second Friday of month, 11:00 am	UH 3430

C. During the first month of the rotation, the resident is expected to spend the majority of their time within the various laboratory sections and in personal study. Once this first month is complete, technologists and/or a director will bring questions and problems to the attention of resident.

D. Training checklists have been prepared as a guide for the resident. It is the residents' responsibility to ensure that they observe or discuss checklist items with either the bench technologist Trainer or a Director. Bench-specific checklists must be signed off prior to completion of the bench rotation. General rotation checklists must be signed off prior to completion of the microbiology rotation. Checklists are accessed from: App2 (H:)/PCCOMMON/residents/Micro training checklists.

E. During the 2nd month of the rotation, the resident will be more actively involved in daily Infectious Disease Laboratory rounds and/or discussions with the Directors. Present a case using appropriate stain and culture materials; correlate with other laboratory findings, including anatomic pathology when appropriate.

F. Present one in-service or clinical case to laboratory personnel on a topic chosen in consultation with a laboratory director.

G. Primary focus during the rotation should be overall laboratory operations, problem solving, and interpretation of results.

H. There is a tremendous amount of information that must be digested for each of the Microbiology sub-disciplines. Therefore, residents are required to maximize presence and participation in the Microbiology laboratories during the 2-month rotation.

GENERAL COMPETENCIES, OBJECTIVES, AND CURRICULUM AREAS FOR CLINICAL MICROBIOLOGY

This rotation provides 2 months of training in diagnostic Microbiology, during which the resident is given the opportunity to gain requisite experience and knowledge in this field. By the completion of training, the resident is expected to develop competence in the six domains outlined below.

A. Patient Care
   1. Correlate microbiological results with clinical data.
   2. Field and provide clinical consultation for queries involving specimen collection specimen transport, and antimicrobial susceptibility testing.
   3. Be familiar with indications for seeking microbiologic diagnosis and the proper type of specimen to obtain for different clinical situations. Be able to troubleshoot specimen collection both in terms of improper specimens or requests and assist the physician as to proper specimen collection and transport procedures.

B. Medical Knowledge
   1. The resident must demonstrate knowledge regarding established and evolving biomedical, infectious disease, and laboratory sciences and the application of this knowledge to diagnostic Microbiology.
   2. Demonstrate an investigative and analytic approach to clinical and diagnostic Microbiology problems.
   3. Apply the basic and clinically supportive sciences appropriate to diagnostic Microbiology.

C. Practice-based Learning and Improvement

   The resident must demonstrate the ability to investigate and evaluate their diagnostic and consultative skills, appraise and assimilate scientific evidence, and improve individual care practices. The resident is expected to:

   1. Utilize practical experience and perform practice-based improvement activities using a systematic methodology.
   2. Evaluate and assimilate evidence from scientific studies related to diagnostic Microbiology issues/problems.
   3. Apply knowledge of study design and statistical methods to the critical review of clinical and diagnostic Microbiology studies.

4. Facilitate and foster the education of students, fellow residents, technologists and other health care professionals, patients, and patient family members.
5. Formulate clinical recommendations using information technology to gather patient data and supportive literature, and to document clinical activities.
6. Utilize electronic resources, manage patient data, and access medical information.

D. Interpersonal and Communication Skills

The resident must be able to demonstrate interpersonal and communication skills that result in effective relationships, information exchange, and learning with other health care providers, technologists, patients, and patient family members. The resident is expected to:

1. Obtain information using effective nonverbal, explanatory, questioning, and writing techniques.
2. Communicate effectively when interacting with others, including communication of test results and consultations.
3. Demonstrate professional and respectful behaviors when interacting with technologists, health care providers, patients, and patient family members.
4. Work effectively with others as a member of a health care team to provide patient-focused care.

E. Professionalism

The resident must demonstrate a commitment to professionalism, adherence to ethical principles, and sensitivity to a diverse patient population. The resident is expected to:

1. Demonstrate respect, compassion, and integrity.
2. Exhibit responsiveness to the needs of patients and society that supersedes self-interest.
3. Display accountability to patients, the healthcare team, society, and the profession.
4. Demonstrate sensitivity to patients' culture, age, gender, and disabilities.
5. Demonstrate a commitment to excellence and professional development.
6. Perform duties consistently in a dependable, responsible manner.
7. Demonstrate a commitment to ethical principles in clinical care and business practices.

F. Systems-based Practice

The resident must demonstrate an awareness and responsiveness to the larger context and systems of health care and the ability to call on system resources to provide microbiology services that are of optimal value. The resident is expected to:

1. Outline the role of the clinical microbiologist, laboratory technologist, and other laboratory professionals in the patient management team.
2. Describe how the practice of diagnostic microbiology affects other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice.
3. Compare and contrast methods of controlling health care costs and allocating resources.
4. Practice cost-effective health care and resource allocation that does not compromise quality of care.
5. Advocate for quality patient care.
6. Form effective partnerships with health care managers and health care providers to assess, coordinate, and improve health care. Describe how these activities can affect system performance.

7. Demonstrate knowledge of institution-specific policies, procedures, and requirements for patient care.

SPECIFIC GOALS AND OBJECTIVES:

A. Be responsible for handling clinical microbiology STAT requests (following consultation with the laboratory Director). The information below is to be used by the Pathology resident to guide the decision as to the acceptability of a STAT request:
   1. For Upstate **pediatric** inpatients (including Peds ER), any STAT requests are approved through Peds ID. The pathology resident should contact the pediatric ID attending on-call. In most cases, the lab would be notified in advance by Peds ID if any of these tests would be requested on evening/night shift or on weekends.
   2. For Upstate **adult** inpatients (including ER), call the ordering physician to determine whether the STAT request is clinically appropriate.
   3. If a physician insists that a STAT request be processed but the reason is not clinically sound, refer the issue to a microbiology director. For any requests that are taken to the director level, the pathology resident must provide the director with pertinent patient information, including current therapy, previous test results, and how the STAT request would change patient management.

B. Be familiar with specimen collection, transport, and processing to ensure successful microbial isolation from clinical specimens.
   1. Specimen collection, transport, and storage.
   2. Specimen processing:
      a. Methods of streaking specimens for isolation.
      b. Protocol for all cultures: bacteriology, mycology, mycobacteriology, parasitology, and virology.
      c. Direct specimen assays: antigen and molecular.
      d. Preparation of smears for staining.
   2. Media:
      a. Ingredients: use and principles of formulation.
      b. Nutritive, selective, and differential media.
      c. Atmospheric and temperature requirements.

C. Be able to use the equipment needed in microbiologic diagnosis (light and fluorescent microscopes, biological safety cabinet, etc.).

D. Be able to perform, read, and interpret all microscopic analyses performed in Microbiology: Gram, auramine, Kinyoun, India ink, KOH, fluorescent antibody, trichrome, modified acid-fast, iodine, lactophenol cotton blue, and saline wet mounts.

E. Be able to list the primary pathogens and indigenous microorganisms associated with each of the following sample types/anatomic system:
   1. Urine
   2. Stool
   3. Respiratory tract (including cystic fibrosis)
   4. Cerebrospinal fluid
   5. Body fluids
   6. Wounds/abscesses
   7. Genitourinary tract
   8. Eye, ear

F. Identification of microorganisms:
    1. Select appropriate media and methods for identification.
    2. Distinguish between indigenous flora and pathogens.
    3. Use flow charts for identification of gram-positive and gram-negative bacteria.
    4. Perform susceptibility tests and interpret results.
    5. Correlate growth and type of organism.

G. Blood cultures: Be familiar with and understand:
    1. Proper collection and processing of blood cultures.
    2. Proper utilization of blood cultures.
    3. BACTEC and other automated blood culture instruments.
    4. Quantitative blood cultures.
    5. Turnaround time for work up of isolates.
    6. QA monitoring for blood cultures: contamination rate and percent single-set and single-bottle draws.
    7. Prepare, stain, and interpret smears from positive blood culture bottles.

H. Understand antibiotic susceptibility methods and interpretation of results. Be familiar with common mechanisms of resistance.

Beta-lactamase	Vancomycin resistance (enterococci, *S. aureus*)_
Kirby-Bauer	Methicillin resistance (staphylococci)
MIC	Beta-lactam resistance (inducible beta-lactamases,
D-zone	ESBLs, carbapenemases)
E-test	
PBP-latex	

I. Anaerobes:
    1. Observe and participate in identification of anaerobes, including processing and special growth requirements.
    2. Unsuitable sample types for anaerobic culture.
    3. Methods of identification.
    4. Be able to describe main characteristics for the identification of *Clostridium* sp., *Bacteroides fragilis* group, *Fusobacterium* sp., and *Propionibacterium acnes*.
    5. Anaerobic susceptibility testing: when to perform, methods, limitations.

J. Understand and be familiar with specimen processing, culturing, and staining of fastidious organisms or those with culture requirements differing from routine bacteriological culture methods including *Legionella*, *Leptospira*, *Bartonella*, and other “atypical” organisms.

K. Parasitology:
    1. Specimen collection and preservation.
    2. Direct macroscopic and microscopic techniques.
    3. Formalin-ethylacetate sedimentation technique.
    4. Trichrome stain..
    5. Modified acid-fast stain for *Cryptosporidium/Cyclospora/Isospora*
    6. Observe trichrome slides and wet preps of known organisms and be able to identify unknown parasites from trichrome and concentration procedures.
    7. EIA for *Giardia* and *Cryptosporidium.*
    8. Wright’s Giemsa stain for bloodborne parasites, e.g. *Plasmodium*, *Babesia*, *Trypanosoma*, etc.

L. Mycology:
   1. Yeasts:
      a. Distinguish different types of yeast, especially *Candida* and *Cryptococcus*, and the infections they cause.
      b. Media and incubation conditions for fungal isolation.
      c. Select appropriate media and/or methods for identification: Murex, API, Vitek.
      d. Direct detection methods: KOH mounts and cryptococcal antigen.
   2. Molds:
      a. Lactophenol cotton blue tape preparation.
      b. Septate vs. aseptate hyphae and demateaceous vs. hyaline molds.
      c. Be able to describe the main identification characteristics for dimorphic molds and *Aspergillus* species.
      d. Phaeohyphomycosis.

M. Mycobacteriology:
   1. Process specimens.
   2. Methods of digestion/decontamination.
   3. Perform and interpret acid-fast stains.
   4. Interpret culture result.
   5. DNA probe identification technology.
   6. Antimicrobial susceptibility methods.
   7. Learn principles, pros & cons of molecular amplification methods for acid-fast bacteria.
      a. PCR and TMA for *M. tuberculosis* complex.
      b. PCR/RFLP for mycobacterial identification.
      c. 16S and HSP gene sequencing for mycobacterial identification.
      d. Perform and interpret PCR for *M. tuberculosis* complex.

N. Virology
   1. Become familiar with and understand the requirements for proper collection and transport of specimens for all tests performed in the Virology Laboratory.
   2. Understand the principles of traditional and shell vial tissue culture.
   3. Know what types of cell lines support the growth of the major categories of viral pathogens – Influenza, Parainfluenza, Adenovirus, RSV, Enterovirus, HSV, CMV, VZV.
   4. Know what viral pathogens are uncultivable or require specialized procedures.
   5. Be able to recognize common patterns of cytopathic effect (CPE).
   6. Understand the principle and applications for direct viral antigen detection methods – DFA, Influenza EIA, RSV EIA, Rotavirus EIA
   7. Be familiar with the various methods for the detection of *Clostridium difficile* or its toxins – culture, latex agglutination, EIA, cytotoxin assay.
   8. Observe and participate in detection of *Chlamydia* by cell culture methods. Learn principles and limitations of methods for detecting *Chlamydia* including cell culture, direct fluorescent monoclonal antibody detection, serology (EIA), and amplification methods.
   9. Learn principles of molecular assays used in Virology:
      a. Real-time PCR for HSV.
      b. HIV-1 RNA quantitation.
      c. FilmArray respiratory panel.
      d. Cepheid Enterovirus PCR.
   11. Determine a set of Virology unknowns which will include cytopathic effects and FA stains.

O. Understand the use of MISYS so inquiries can be made via the LIS.

P. Review quality control and quality assurance practices performed by the laboratory.

EVALUATION

Residents will be evaluated by the attending faculty as to their base of knowledge during bench work consultations, Infectious Disease Laboratory rounds, and conference presentations. A significant percentage of the rotation evaluation will be derived from attendance and participation in ID Laboratory Rounds. The resident is expected to attend a minimum of 90% of these rounds.

READING ASSIGNMENTS/REFERENCES: Primary references in bold.

A. Primary reading assignments from laboratory manuals and reference 5. See rotation calendar.
B. Supplemental reading assignments from reference 7:
    1. Bacteriology
        a. REI/Plating – Chapter 63
        b. All other benches – Chapters 56, 57, and 58
    2. Virology – Chapters 54 and 55
    3. Mycobacteriology – Chapter 59
    4. Mycology – Chapter 60
    5. Parasitology – Chapter 61
    6. All rotations – Chapter 62

C. References
    1. **Microbiology and Virology Laboratory Manuals**
    2. Pertinent microbiology literature
    3. Clinical and Laboratory Standards Institute. Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria that Grow Aerobically *and* Performance Standards for Antimicrobial Disk Susceptibility Tests
    4. Versalovic, J. et al., ed. Manual of Clinical Microbiology, 10th edition. American Society for Microbiology; Washington, D.C. 2011.
    5. **Tille, Patricia M., Bailey and Scott's Diagnostic Microbiology, 13th edition. Mosby; St. Louis, 2014.**
    6. Winn W, et al. Color Atlas and Textbook of Diagnostic Microbiology, 6th edition. J.B. Lippincott; Philadelphia, 2006.
    7. **McPherson, RA and MR Pincus eds. Henry's Clinical Diagnosis and Management by Laboratory Methods, 22nd edition. Saunders/Elsevier, Philadelphia, 2011.**
    8. Mandel GL, et al., ed. Principles and Practice of Infectious Diseases, 7th edition. Churchill Livingstone; New York, 2010

D. Electronic Media Resources:
    Accessible through any LAN-enabled PC at **App2 on 'Sun_server' (H:)/ PCCOMMON/Micro Training**:

Bacteriology I Image Atlas	Parasitology Image Atlas
inQUIZator – Mycology	The Anaerobe Educator
inQUIZator – Parasitology	Wheel of Bacteriology
Mycology Image Atlas	Wheel of Parasites

MOLECULAR PATHOLOGY

Length of rotation: *1 month*

Teaching Staff:
Shengle Zhang, MD – Director of Molecular Pathology
Antony Shrimpton, PhD – Assistant Director of Molecular Pathology

It is the aim of the SUNY Upstate Medical University Molecular Diagnostics section to provide a 1-month rotation in Molecular Pathology with an optimal opportunity to obtain the in-depth knowledge and competence necessary for practice of pathology with specialty expertise in molecular diagnostics. This will be offered as part of the resident's core curriculum and will be completed in the 2nd, 3rd or 4th year of training. During this period, residents are expected to familiarize themselves with the principles and performance of, and gain practical experience in the use of, techniques and interpretation of currently performed molecular genetic and molecular oncology tests, and in the management of a Molecular Pathology Laboratory. Residents will also learn basic principles of molecular biology through participation in signing out of genetic and oncologic reports and the review of lecture power point slides.

Goals

The resident will be able to use and interpret molecular testing in the diagnosis of hematolymphoid malignancies and genotyping of inherited disorders. The specific goals of the Molecular Pathology rotation are:

1. Acquire a base of knowledge, skills, experience and understanding of the principles and applications of methods used in contemporary clinical testing involving molecular biology applied to genetic and acquired disorders.
2. Attain competency in the science and practice of Molecular Pathology through exposure to the process of applying and interpreting data generated by molecular tests.
3. Acquire the skills, knowledge and understanding of the technical and performance limitations and potential pitfalls inherent in the methodologies employed so as to avoid pitfalls in misinterpretation.
4. Acquire sufficient skills, knowledge and understanding of the process of setting up molecular testing, including validation, administrative and statistical requirements.

Objectives

By the completion of training, the resident is expected to develop the competencies in the domains below to the level expected of a new practitioner in molecular diagnostics.

1. The resident will understand the basic concepts of molecular biology; will be familiar with current diagnostic techniques; will be able to correlate molecular results with other laboratory findings; will understand the economics of molecular testing.
2. By the end of the rotation residents should be comfortable in their ability to interpret results generated using molecular techniques used in clinical laboratory testing, including:
    a. DNA and RNA isolation/preparation
    b. Restriction endonuclease digestion of DNA
    c. Gel electrophoresis
    d. Hybridization theory (Southern blot, dot blot, etc.)
    e. Polymerase Chain Reaction (PCR) theory and technique, including real time quantitative PCR (qRT-PCR).
3. Discuss the general approach for implementing and validating molecular assays for clinical service work meeting Federal and State requirements.

4. Describe and apply the principles and techniques involved in molecular genetics and molecular oncology, including those employed in the Molecular Diagnostics Laboratory as well as elsewhere (qRT-PCR, automated DNA sequencing, Next Generation Sequencing etc.).

Competencies

Patient Care
Inspect gels of PCR studies for T- and B-cell clonality studies and report clonality. Evaluate mutation analyses for presence of mutation and hetero/homozygosity. Review reports of send-out testing and sign out with attending.

While on other rotations, correlate molecular pathology results that pertain to the patient. For example, all factor V Leiden patient results will be reviewed at the time of Special Hematology sign-out of that patient. Similarly T- and B-cell clonality assays will be reviewed in the context of bone marrow, lymph node or other examinations. Write an addendum to final reports and sign out with hematopathology attending.

Medical Knowledge
The resident will be familiar with sample selection, DNA and RNA purification and storage conditions for molecular tests. He/she will understand the operating principles of PCR, real-time PCR, reverse transcription, mutation analysis, and separation and detection methods of PCR products.The resident will show understanding of basic concepts of molecular biology.

Practice-Based Learning
Read general texts on molecular pathology. The resident will review the literature for evolving new molecular testing, for example the WHO Classification of Hematologic Neoplasms that are defined by DNA technology. Familiarize themselves with the principles, tests and equipment. Review Molecular Pathology PowerPoint presentations. Depending on previous molecular experience perform a molecular mutation detection via PCR analysis for a disease allele on a biological sample (eg. CF Delta 508 detection on their own blood),.

Systems-Based Practice
Demonstrate knowledge of institution-specific policies, procedures, and requirements for patient care. Spend time with the director to learn the concepts of molecular genetics such as direct mutation analysis versus linkage, etc. Be familiar with cost and reimbursement of genomic studies and patent issues unique to DNA probes and PCR technique. Consider cost/benefit ratios of rare tests, including the financial value of quick turn-around and New York State validation requirements.

Professionalism
Demonstrate respect, compassion, and integrity and exhibit responsiveness to the needs of patients and society that supersedes self-interest.

Demonstrate a commitment to excellence and on-going professional development and perform duties consistently in a dependable, responsible manner.

Review past cases and evaluate, make preliminary interpretation and present sign-outs to the attending, including performing Bayesian calculations - during the second half of their rotation. Become sufficiently knowledgeable about all tests performed by the section so as to provide consultative activities by discussing appropriate testing with referring clinician

Interpersonal and Communication Skills
Work effectively with molecular pathologists. Be prepared to present to her/him any emerging test that has to be performed in your practice. Be an effective consultant to clinicians in regards to testing selection, sample requirement, timeline of testing and significance of results. Research and present at staff meeting, either an interesting case or a potential test for consideration for addition to the service.

Graduated responsibility in this section: As residents become more familiar with the tests, they are better able to help advise in the selection of appropriate molecular testing. A second rotation elective is available and involves the research evaluation and adoption of new molecular diagnostic tests.

CURRICULUM

Tests performed:

Molecular genetics: Cystic fibrosis, Fragile X syndrome, MTHFR, Factor V Leiden, Factor V HR2, Hereditary Hemochromatosis and Prothrombin 20210G>A.

Molecular oncology: B cell gene rearrangement, T cell receptor gene rearrangement, JAK2 V617F, FLT3-TKD and FLT3-LM, BCR-ABL1 quantification.

Molecular techniques are used in other sections, including the core sequencing lab, infectious diseases, cytogenetics (FISH), immunology, AP Molecular Pathology etc.

Didactic Lecture Series
Residents should review the Medical Genetics and Oncology Power Point lectures including Epigenetics, Evolutionary Medicine, Dynamic Mutations, Gene Rearrangements, Immunogenetics, Lymphomas and Leukemias, Modes of Inheritance (Mendelian and Quantitative), Microarrays, Molecular Technology, Personalized Medicine, Pharmacogenomics, Thrombosis, and take accompanying tests.

Wet Lab
Unless residents have a strong molecular background, they will perform PCR on DNA extracted from blood and test it for a common genetic variant (e.g. delta F508, FRAXA CGG repeat etc.).

Core Molecular Pathology Rotation

Throughout the Core Molecular pathology rotation, the resident will attend the following meetings/conferences:

Molecular Pathology staff meeting, CP Conference Rm, alternate Fridays, 11:00 am
The resident should also arrange to meet (usually in the afternoons) with the Molecular Pathologist on service each day to review clinical cases; the molecular pathologist on service. The resident need not preview these cases in the first part of the rotation, but in the latter half of the rotation (depending on the resident's proficiency) the resident should arrange to receive and preview these cases prior to looking at them with the molecular pathologist. Note that it is unacceptable to retain cases overnight without notifying the molecular pathologist; if the resident is unable to review the cases prior to the sign-out session, at the molecular pathologist's discretion, the cases may be signed out without preview by the resident.

General reading on Molecular Pathology should include
Thompson and Thompson Genetics in Medicine 7th Edition. WB Sauders
Molecular Diagnostics for the Clinical Laboratorian Ed Coleman WB and Tsongalis GJ
Diagnostic Molecular Pathology. Ed. Debra G B Leonard 2003 WB Saunders

Method of Evaluation
Global Rating of Live or Recorded Performance: A rater judges general categories of ability (patient care skills, medical knowledge, interpersonal and communication skills) and the ratings are completed retrospectively based on general impressions collected over a period of time (end of rotation) derived from multiple sources of information (direct observations or interactions); input from other faculty, lab technicians and residents and review of work products or written materials.

TRANSFUSION MEDICINE
Rotation Length: 3 months

***Teaching Staff**:*
Matthew Elkins, MD, PhD - Director
Zhanna Spektor, MD

Goals

The main goal of this rotation is to provide residents with the necessary tools in contemporary blood banking and transfusion medicine to be able to effectively deal with the related issues encountered in a general pathology practice. The rotation will also serve as a basic foundation for those interested in pursuing a fellowship in transfusion medicine/blood banking as a subspecialty.

Objectives

Acquire knowledge, skills, experience and understanding of transfusion medicine/blood banking.

1. Attain competency in the science and practices of transfusion medicine to be able to make good decisions reflecting sound judgment and accountability to patient and patient's physician in the practice of transfusion medicine.

2. Acquire skills, knowledge, and understanding of administrative and operational aspects of transfusion medicine.

Patient Care
Resident must demonstrate diagnostic competence and the ability to provide appropriate effective consultation in the context of blood banking/transfusion medicine services.

Medical Knowledge
The resident's knowledge will be assessed on his/her work up of transfusion reaction reports, immunohematology reports for sign out as well as the management of therapeutic apheresis patients.

Practice Based Learning and Improvement
Resident must be able to perform literature search related to the patient's health problems, incorporate formative evaluation feedback into daily practice and demonstrate competence in using information technology to optimize learning and improve patient care.

Interpersonal and Communication Skills
Resident will be assessed in providing appropriate and effective consultation to other physicians and health professionals. Resident will also be assessed on their ability to communicate effectively with the attending staff, blood bank staff, other health care professionals and patients.

Professionalism
Resident must demonstrate integrity, an understanding of cultural diversity of patients and donors and respect the privacy and autonomy of patient and donors.

System-Based Practice
Familiarization with the health care system and ability to call on system resources as needed to provide transfusion medicine services of optimal value to patients will be assessed.

Graduated Responsibilities

PGY-1

In the first year, the resident learns routine blood bank procedures. This part of the training includes performing procedures and review of case studies as examples of problem-solving techniques. The rotation includes:

1. Learn procedures in typing, crossmatching and screening for and identifying irregular antibodies of recipient blood.
2. Communicate results of crossmatch problems to clinicians and recommend solutions.
3. Obtain relevant clinical information on patients with complicated irregular antibodies and transfusion reactions
4. Meet with the immunohematology technologist and supervisor to review work-ups and prepare reports on antibody and transfusion reactions consultation.
6. Sign-out immunohematology reports with Blood Bank attending or Director BB/TM.

Transfusion reactions (see patients, perform evaluation, and write consultation notes)

Residents will be involved in transfusion reactions reported to the Blood Bank. Responsibilities include:

1. Evaluate acute transfusion reactions. See patients immediately with suspected hemolytic
2. Transfusion reactions. Review Blood Bank work-up and request additional studies if indicated.
3. Complete transfusion reaction report forms for attending counter-signature within 24 hours.
4. Enter note in patient's chart of preliminary report and any recommended action or follow-up.
5. Make recommendations for use of special components (i.e., filtered, washed cells or premedication).
6. Complete a delayed hemolytic transfusion reaction form on patients who develop an
7. Alloantibody or positive direct antiglobulin test within three months of a transfusion.
8. Follow-up suspected cases of post-transfusion hepatitis. Gather necessary clinical and transfusion information and prepare report for Red Cross. Follow-up with Red Cross and attending physician.
9. Gather data for look-back requests and related New York State and FDA as appropriate.

PGY-2

Therapeutic apheresis and therapeutic phlebotomy (see patients and write a consultation notes)

The resident, in addition to the above duties, works in the second month with the attending physician, coordinator and nursing staff to learn about hemapheresis procedures. The rotation is designed to give the resident increasing responsibility for this. Activities include:

1. The resident will become familiar with technical procedures of the hemapheresis section including progenitor (stem) cell collections, therapeutic plasma exchange, white cell and platelet reduction, red cell exchange, plasma volume calculation, and fluid balance.
2. Under the direction of the hemapheresis attending, the resident will learn evaluating hemapheresis patients, writing orders, responding to clinical problems and providing patient management during and between procedures, especially in patient reactions during procedures.
3. Initially, the resident will remain with the patient throughout the procedure to familiarize herself/himself with all aspects of medical/nursing care.
4. The resident will assume progressive responsibility for the management of hemapheresis patients and share coverage with the pathologist attending for off-shift therapeutic procedures.
5. Under the supervision of the Nurse Coordinator of the Apheresis Service, the resident will become familiar with hemapheresis catheter care, trouble shooting, and instrument problem identification and solving.
6. Following completion of his/her rotation, the resident will be able to manage all aspects of hemapheresis therapy both technical and clinical.
7. The resident will achieve an understanding of the goals, strategies, and problems related to peripheral blood progenitor collection. She/he will interact with the appropriate clinician regarding problems in this area and CD34 cell target attainment.

American Red Cross Blood Services, New York/Penn Region Red Cross (The resident is required to spend a day or two at the ARC to familiarize him/herself in the operation of a blood center)

Testing for infectious disease markers, with the exception of stat testing for CMV antibody, is done off-site in either Dedham, MA or Detroit, MI. However, the trainee will be exposed to the processes of receipt of test results, updating of applicable computer files for release of blood for labeling and for tracking deferred donors in the donor deferral register and counseling of donors with positive test results.

Donor collection (medical history, collection of blood, recruitment of donors, preparation of components.)

The resident will become familiar with all stages of blood collection at the regional Red Cross Center near Rochester.

This will include the organizing of mobile blood drives, medical history questions, and managing donor reactions. The resident will observe Donor Recruitment Department, in recruiting new blood drive sponsors. The resident will become responsible in blood component preparation, including the making of packed red cells, platelet concentrates, fresh frozen plasma, cryoprecipitate, cryopoor plasma, leukocyte reduced blood components and donor hemapheresis products with emphasis on platelets. The resident will also become familiar with the methods of washing and freezing red cells. He/she will learn the appropriate indications for the use of the products. Donor hemapheresis emphasizing platelets but also granulocytes will be stressed in all aspects of patient care, collection and processing.

Duties and Responsibilities:

Daily:

1. ..Organize and attend rounds for blood component utilization and sign out of reports at 1330 hours, Monday-Friday.
2. Review the blood component utilization from previous day (and present at 1330 hours in conjunction with the blood component order (BCO) form.
3. Present copy of current day's surgery schedule for review of associated blood component orders to anticipate needs and balance with inventory.
4. Present follow-up reports on queried/interesting cases from prior review and returns versus orders, noting blood returns, in connection with previous day's scheduled surgery list.
5. Present reports for sign-out:
    i. antibody reports (within 24-48 hours)
    ii. transfusion reaction reports (within 24-28 hours)
    iii. HLA antigen/antibody typing reports (when ready)
6. Review and respond to all pre-transfusion blood product requests and especially pre-admission testing orders (PAT) to ensure compliance with the Guidelines for Ordering Blood regularly when contacted by technologists.
7. Complete Blood Utilization Review (BPUR) forms on the computer for queried cases (on Drive H). Document all interactions with and responses from clinicians regarding blood product ordering.

Blood Bank

1. Take calls from blood bank technologists and respond promptly
2. Schedule Immunohematology Benchwork with the BB supervisor (usually afternoons).

HLA/Tissue Typing Lab

1. Take calls from technologist when contacted
2. Anticipate living donor solid organ transplants
3. Schedule benchwork/demonstration with supervisor after initial month of TM rotation

Apheresis Service

1. Evaluate apheresis requests, obtain consent, ensure that placement of vascular access device is undertaken or has been requested. Evaluate patient and write orders notes in patients' charts (pre-, mid-, post-procedure).
2. Attend pheresis procedures (pre- and post-)

Education

1. Review of blood component utilization and sign out of transfusion reactions form the basis for instruction and teaching in Hemotherapy.
2. Sign-out antibody reports with appropriate review of corresponding blood group system form the basis for teaching in Immunohematology.
3. Review of surgery schedule and evaluation information/communications from ARC form the basis for instruction in blood component inventory management and procurement.
4. Review sign-outs of HLA antigen typing/antibody screen/detection, deceased and living donor and recipient transplantation, and B27 reports are the basis for instruction in Transplantation Medicine.
5. Follow and monitor at least one solid organ transplantation through hospitalization.
6. Participate in progenitor cell infusion for at least one patient.
7. Apheresis education is conducted on site on the Apheresis floor.
8. Follow daily interesting/instructive patients relevant and be prepared to update daily.
9. Hands-on benchwork forms basis of instruction for routine blood bank procedures.
10. Participate in related journal clubs and conferences.

Recommended reading list

Clinical Practice of Transfusion Medicine, 3rd edition by Petz & Swisfer.
Blood Transfusion Therapy. A Physician Handbook, 10th edition by Prisciotto.
Henry's Clinical Diagnosis and Management by Laboratory Methods, 22nd edition.
Technical Manual, 17th edition. AABB.
Scientific Basis for Transfusion Medicine, edited by Anderson & Ness.
Apheresis: Principles and Practice, 3rd edition, by McCleod, Price, et al.

Conferences

The resident is expected to participate in the following conferences:

Name of Conference	Frequency	Department Responsible
Blood Bank Conference	2 per month - Tues 0800	Pathology/TM
AABB/ASCP Teleconferences	6 per year - Wed 1300	Transfusion Medicine
Renal Transplant/Dialysis	Weekly – Fri 0800	Surgery/Medicine
Bone Marrow/ Progenitor (Stem) Cell Conference	Weekly - Weds 1500	Medicine/ Hematology-Oncology

PATHOLOGY RESIDENT ELECTIVES

ADVANCED SURGICAL PATHOLOGY ELECTIVE (PGY-4)

Requirements - Open to qualified 4th year residents pending approval of the Co-Directors of Surgical Pathology.

Length of Rotation - One month

Teaching Staff:

University Hospital Downtown:

Christopher Curtiss, MD
Gustavo de la Roza, MD
Ola El-Zammar, MD
Joseph Fullmer, MD, PhD
Rana Naous, MD
Alfredo L. Valente, MD
Shengle Zhang, MD
Qun Wang, MD
Kerry Whiting, MD

University Hospital Community Campus:

Rohin Mehta, MD
Kerry Whiting, MD

Goals & Objectives

This rotation will enhance the ability of the resident to:

1) Strengthen skills and knowledge required for independent practice of surgical pathology.
2) Sign out frozen sections under supervision.
3) Practice effective verbal and written communication with clinicians.
4) Enhance the ability to prepare accurate, complete and succinct reports.
5) Maximize the use of H&E morphology and clinical data.
6) Integrate clinical data and pathologic findings.
7) Enhance the ability to use ancillary studies (special histochemistry, immunohistochemistry and molecular techniques) for diagnosis and prognostication in an effective and cost-efficient manner.

Description:

This rotation offers the resident the possibility to experience advanced training with increasing responsibility in a tertiary setting of a teaching hospital (UH Downtown) and/or in a community practice setting (UH Community). The resident will have similar responsibilities and will be expected to perform at the level of a Surgical Pathology Fellow, but without sign out privileges.

Frozen Sections:

Residents will be assigned to frozen sections with surgical pathology faculty for at least one week. The resident will be responsible for supervising the resident or PA on the Frozen Section Service performing the gross examination and selecting tissue sections for the frozen section resident or PA to freeze, cut and stain. The resident will review the frozen section prior to the attending pathologist and will be expected to formulate an independent diagnosis, prepare a report, and call in the results to the operating room.

Signing Out Routine and Biopsy Specimens:

Preferably, the resident will be assigned to either service on the days that there is no resident on a regular Surgical Pathology rotation to maximize the experience. While a PA will be grossing in the specimens for the resident of this rotation, it is his or her responsibility to be familiar with the gross examination of all assigned complex cases. On the Biopsy Service, resident will preview cases as usual and will either sit with the attending for sign out or, depending on their experience and ability, may be allowed to dictate cases or type the cases using the Coded Diagnosis in the system prior to the attending review. Ordering of ancillary studies needs approval of the attending pathologist. On the Routine Service, the resident will preview and dictate final diagnoses or type the final diagnosis using Cancer Templates or Coded Diagnoses on the first day and will review the cases with the attending pathologist on the second day. It is within the purview of the attending pathologist to decide which cases need to reviewed together at a double-headed microscopy and which ones do not.

Community Campus:
Because Surgical Pathology at the Community Campus is not divided into different services like at the Downtown Campus, the resident will work side by side with the attending pathologist on frozen sections, sign out, and gross room supervision.

Level of Supervision:

While increasing responsibility and working towards independent practice is the objective, the attending pathologist will decide on the level of supervision the resident needs and this will be based on the individual's performance and ability to operate independently. It is expected that the supervision by the attending will ease as the resident acquires more experience during the rotation.

Forensic Pathology at Medical Examiner's Office

Requirements - Prior rotation through the Medical Examiner's Office and approval by the Chief Medical Examiner.

Time Period - One month

Description - This course will be an expansion of the experience in the field of forensic pathology beyond the "autopsy room". The resident will accompany a forensic investigator to death scenes and community education opportunities. The resident will also spend time at the toxicology, DNA, and criminalistics laboratories. The resident may accompany the Medical Examiners to court to observe expert witness testimony and be present at meetings with attorneys discussing criminal and civil litigation.

The resident will attend the morning and afternoon briefing meetings held Monday through Friday at the Medical Examiner's Office. The resident is free to attend any other routine or emergency meetings held concerning specific cases or topics such as the quarterly law enforcement conference or the monthly child death fatality review team meeting.

Additional responsibilities may include signing out autopsy microscopic slides, performance of forensic autopsies/examinations, or providing written clinical summaries of case files.

Contact - Robert Stoppacher, MD, Chief Medical Examiner

Pulmonary Pathology

Time Period - Two weeks – 1 month

Goals and Objectives

At the end of this rotation the resident will be expected to be familiar with all forms of interstitial lung disease and be able to diagnose common conditions. He/she will also be able to classify lung cancer according to the current lung cancer classification scheme and understand the relevance of this classification to prognosis and new treatment modalities.

Patient Care and Medical Knowledge - residents will review outside pulmonary consultation cases each day and discuss them with Dr. Curtiss. They will also review a teaching slide set of pulmonary diseases as well as all lung biopsy specimens that come through the University Hospital service.

Practice-based learning - residents will be expected to read extensively about each disease process.

Interpersonal and Communication Skills – residents may present cases at the monthly Pulmonary Conference if desired.

Contact - Christopher Curtiss, MD

Dermatopathology

Time Period - One month

Description - Residents will attend dermatology clinics with Dr. Ramsay Farah and will follow-up on all biopsies that he performs. Those biopsies will be reviewed with Dr. Farah. Residents will also look at skin biopsies from the routine service and review them with Dr. Farah when necessary. The residents will be expected to review skin biopsy immunofluorescence studies with Dr. Tatum. Extensive reading on dermatopathology is expected.

Contact - Ramsay Farah, MD

Environmental Pathology

Time Period - One month

Description - Residents and fellows are welcome to participate in many of the ongoing activities in the Environmental and Occupational Pathology Division. In the 2003-2004 year the major activities in which residents and fellows may choose to participate include:

1. Review of Histopathology of Classic and Unusual Env/Occ Lung and other organ diseases.
2. Development of Teaching Set
3. Case reports of Interesting Env/Occ cases
4. Learning about Analytical Electron Microscopy and using Scanning EM facilities in the Department to study tissues or other materials of Contact - Jerrold Abraham, MD [abrahamj@upstate.edu]

Eye Pathology

Time Period - One month

Description - Residents will participate in gross examination of new ocular specimens under the dissecting microscope, directions for their processing and subsequent microscopic diagnoses. Review of ocular region tumors and ocular disease processes that commonly come to a general pathology laboratory will form the core of the elective, using our many teaching sets. Residents may choose a subject for concentration if desired, and could develop a small set of teaching slides or photomicrographs for later reference or use in lectures.

Analysis of selected portions of large research data as part of Syracuse study of Indoor Environmental Factors and Inner City Asthma.

Env/Occ projects of interest Investigation of Env/Occ exposures in 'idiopathic' interstitial lung disease. Investigations of Fine and Ultrafine Air Pollution Measurements and links to health effects.

Contact - Ann Barker-Griffith, MD

Renal Pathology

Length of rotation: One month

Teaching Staff:
Paul F. Shanley, MD
Clarissa Cassol, MD

Goals

1) Acquire a broad base of medical knowledge, skills and experience in renal pathology. Seeks new information and attempts to apply it. Seeks and critically appraises new information in improving their fund of knowledge and understanding of disease mechanisms.
2) Analysis and synthesis of clinical data. Ability to formulate differential diagnoses and rationale.
3) Demonstrate the ability to provide appropriate and effective consultation in collaborating with other clinicians, namely nephrologists.
4) Become capable of accessing the role of the diagnostic techniques of light microscopy (LM), immunofluorescence (IF) and electron microscopy (EM) in clinical decision-making, particularly in relation to renal biopsies.

Objectives

By the end of the rotation, the resident should be able to:

1) Conduct effective medical communication with clinicians regarding the interpretation of biopsy results.
2) Participate in realistic problem-solving through participation at monthly conferences and in exchanges with clinicians.
3) Discuss the language of renal medicine *at least* at the level represented in general pathology textbooks such as Robbins & Cotran Pathologic Basis of Disease. (It is suggested that the kidney chapters in these books be reviewed prior to starting the rotation).

Duties/Responsibilities

The main task of the resident is to participate in the processing and signing out of current cases on the service.

The responsibility with respect to current cases includes:

1) Examination of gross tissue submitted using the dissecting microscope
2) Initial evaluation by light microscopy (LM)
3) Evaluation of immunofluorescence (IF) studies
4) Review of electron microscopy (EM) results
5) Study and investigation in specialty textbooks and current literature in relation to the problems raised by the cases

In addition to the current cases, the resident will:

6) Work through study sets of prototype kidney disease cases that will be provided
7) Spend time learning the operation of the transmission electron microscope (EM)
8) Communicate with and assist clinicians from other departments with regard to analysis of biopsy results
9) Attend weekly renal conferences on Tuesdays at 4 p.m. and participate in the Renal Pathology conference given on the 4th Tuesday of the month

Methods of Evaluation

1) Evaluation of residents by faculty members is carried out via use of MedHub. This system prompts electronic evaluation at the end of each rotation, and is based on the six competencies of the ACGME Outcomes Project. The Program Director monitors these comments on a regular basis, and reviews them with the residents at each formal evaluation session. Each formal evaluation document also includes suggestions by the Director for improvement, which is then monitored at the next session. The Director creates a final evaluation of each resident who completes the program. This is maintained in a permanent record.

2) To assure quality in training and to comply with requirements for residency accreditation, an *online interactive case module* was developed to evaluate the resident's achievement of stated educational goals and to benchmark progress in Renal Pathology training.

Neonatal/Perinatal Autopsy at Crouse Memorial Hospital

Description - Residents will perform pediatric (mainly neonatal) autopsies at Crouse Hospital under the direction of Dr. Rachel Elder. They will be expected to dictate the gross findings, provide a preliminary diagnosis, review the microscopic slides, and dictate microscopic descriptions and final diagnoses in a timely fashion. They will present the findings at conferences when indicated.

1. Michael Sovocool pages Donald Jaeger if a neonatal autopsy is planned (467-2271).

2. Don pages the autopsy resident.

3. If the resident cannot go to Crouse due to a conflict with an MEO autopsy, he/she will call Crouse Pathology to notify them (470-7396). However, neonatal autopsy takes precedence over a regular autopsy.

4. The resident performs the autopsy based on Crouse protocols.

First day: Review of history and circumstances of death; external examination of the body; gross dissection; paperwork, including written description of gross findings and preliminary diagnosis is completed ideally on the first day. Preliminary anatomic diagnosis MUST be sent within 48 hours of autopsy. If dissection is completed on day 1, then sections should be submitted.

Second day: Dissection is completed if tissue has been fixed prior to examination. Sections should be submitted by the end of day 2. Clinical history and autopsy gross description should also be completed by the end of day 2. Dictations must be done into the Crouse system for transcription at Crouse or entered via file upload to Crouse's pathology information system. (Co-Path).

Third day: Slides may be ready. Crouse will notify the residents when slides are received from histology. Review of microscopic and laboratory findings.

Within 30 days: preparation of microscopic findings and development of opinion on cause of death. A sign out session should then be scheduled at the convenience of the attending pathology staff member at Crouse.

Crouse Pathology	470-7396
Michael Sovocool	470-7344
Donald Jaeger	464-5123/464-4750 Beeper: 467-2271

Neuropathology Elective

Time Period: One Month

Teaching Staff:
Robert Corona, DO, MBA
Joseph Fullmer, MD, PhD

General Description:

This rotation is designed to provide an in-depth exposure to the pathology of central nervous system (CNS) and neuromuscular diseases. Residents rotating on Neuropathology will be involved in intraoperative consultations and correlation with neuroradiologic imaging studies as well as signing out cases presented to the neuropathology service. They will learn to formulate a differential diagnosis before signing-out their cases with an attending neuropathologist.

Goals and Objectives:

Recognize and correctly interpret the pathology of common CNS and neuromuscular diseases. Develop knowledge of the spectrum of neoplastic and non-neoplastic CNS and neuromuscular diseases through reading of textbooks and primary literature.

Demonstrate the ability to evaluate and improve their clinical practices based on new and evolving scientific evidence.

Residents must demonstrate an awareness and responsiveness to the larger context and system of health care and the ability to call on system resources to provide optimal pathology services.

Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and learning with other health care providers, patients, and patients' families.

Residents must demonstrate a commitment to fulfilling professional responsibilities and ethical principles and sensitivity to a diverse patient population.

1. Background reading

Required reading material

Gray, De Girolami, and Poirier. *Escourolle and Poirier's Manual of Basic Neuropathology*, 4th edition. OR
Prayson RA. Neuropathology. A volume in the series: Goldblum JR, ed. *Foundations in Diagnostic Pathology*.

Reference Texts:
1. Ellison and Love. *Neuropathology*, 2nd edition
2. Dubowitz. *Muscle Biopsy*, 3rd edition
3. WHO Classification. *Tumors of the Central Nervous System*, 2007

2. Review of CNS pathology teaching set slides

3. In-house cases

Active neuropathology cases will be reviewed independently and then with the faculty member on service.

4. Conferences

The resident will attend all neuropathology conferences during this rotation. These include Thursday morning brain cutting and the monthly neuro-oncology conference.

Outpatient Biopsy Service/GYN Pathology/Cytology

Time Period - One month

Description - This elective takes place in LabCorp, a free standing private laboratory located at 600 East Genesee Street. Residents are exposed to a busy outpatient biopsy and cytopathology service.

Contact - Kenneth Strumpf, MD

GOALS

This is a one month rotation designed to give the resident exposure to a busy outpatient service. The biopsy material is heavily weighted to gynecologic and dermatopathology material that will give the resident an opportunity to greatly expand her/his experience with these specimens. A large volume cytopathology practice with heavy emphasis on Pap smears is also available for the resident experience. Residents will have the daily slides of all biopsy material along with diagnoses available for their review. Cytology material is available to the degree the resident wishes to use for their education. The pathologists are available to review cases as the resident requires.

OBJECTIVES

- Become proficient with the evaluation and grading of cervical dysplastic and neoplastic lesions in tissue pathology.
- Develop increased expertise in the interpretation of endometrial biopsies and curettings.
- Review challenging gynecologic cases sent for consultation.
- Gain exposure to a wide range of dermatopathologic specimens.
- Learn how to diagnose neoplastic and inflammatory skin diseases.
- Gain experience in diagnosing cytology specimens with emphasis on the Pap smear.
- Observe the functioning of a large volume, busy biopsy and cytology service.

Research (General)

Time Period - variable, at least one month

Description - Residents have the opportunity to undertake research projects with any staff member of Pathology or another department. It may be either clinical or laboratory research. Residents must have a specific project and will be expected to present their findings at a Pathology Grand Rounds conference when finished. Residents must have approval of the Residency Director.

CLINICAL PATHOLOGY ELECTIVES

Requirements - Electives in Clinical Pathology are available to those who have completed the basic requirements of a respective laboratory section.

Time Period - These are usually of one to two months duration but may be longer with consent of the chief of the service and/or sponsoring faculty member.

Advanced Flow Cytometry

Description - Residents will study the clinical and research applications of Flow cytometry. These include multiparameter analysis utilizing clinical and LSR level research instrumentation, development of new disease testing algorithms, standard and high speed cell sorting, and interaction with basic research faculty and staff.

Contact - Theresa Haven

Transfusion Medicine:

Description - Advanced Transfusion Medicine provides a general or focused opportunity to provide direct and consultative patient care service and also research depending on time available in Blood Banking, Hemapheresis, HLA, Progenitor Cells and Transplantation

Contact - Matthew Elkins MD, PhD

FELLOWSHIP PROGRAMS

CYTOPATHOLOGY FELLOWSHIP

Kamal K. Khurana, MD - Director

Structure of Program

SUNY Upstate Department of Pathology is the principal location for the 12-month training period. Although Cytopathology is a distinct section within Anatomic Pathology, there is ample opportunity to access information, material and expertise from other areas within the Department of Pathology as well Upstate Medical University. Emphasis is placed on the correlation and integration of surgical pathology with all aspects of cytopathology. In addition, the importance of ancillary studies such as immunochemistry, flow cytometry, and cytogenetics is also recognized. As a result, the fellow has frequent interaction with staff and fellows in hematopathology, neuropathology, immunopathology, microbiology, and molecular diagnostics during the diagnostic workup of fine needle aspiration biopsies. In addition, the fellow is encouraged to attend and participate in a variety of interdisciplinary conferences that will enhance his/her fund of knowledge. A pathology based Fine Needle Aspiration Service is incorporated within the Section of Cytopathology. This FNA Service allows the fellow to actually perform fine needle aspiration and directly interact with clinical colleagues as a consultant. In addition to learning FNA techniques, staining and interpretation, the fellow is also taught how to originate and manage an FNA Service.

There are no distinct cytopathology/surgical pathology rotations, rather the trainee is expected to participate in all aspects of cytopathology and the allied sections under the guidance of the attending cytopathologist on service. As indicated above this fellowship is based on an apprentice-mentor system. However, the training program is somewhat flexible depending upon the individual's prior training and specific goals. Formal rotations (not to exceed a total of 6 weeks) as well as individualize didactic/practical instruction can be arranged with the consent of the involved faculty. Specific "hands on" training is available as rotations in the following laboratories:

1. Immunopathology: learn the principles and basic techniques of immunochemistry as applied to histopathology and cytopathology. (R. Hutchison, MD Directors)
2. Molecular Diagnostics: learn the principles of various techniques (gene rearrangement, in situ hybridization, polymerase chain reaction) with practical application in the PCR laboratory. (S. Zhang, MD, T. Shrimpton, PhD, and C. Stein, PhD).
3. Flow Cytometry: learn the principles of image analysis and various applications of flow cytometry and cell sorting with emphasis on lymphomas.
4. Electron Microscopy: learn the techniques involved in transmission and scanning electron microscopy and develop practical expertise with TEM by analysis of aspiration biopsy samples. (A. Tatum, MD, PhD and Steve Landas, MD). In addition, as the trainee progresses and more responsibility is assumed, the trainee will function at the level of junior staff. The responsibilities of the fellow during this period are indicated below.

Service

The fellow will be responsible for reviewing all abnormal cytology cases and will diagnose both surgical and cytology cases with an attending pathologist during daily sign out. There will be instruction in the technique of fine needle aspiration biopsy (FNAB); the fellow is responsible for performing this technique on patients referred to surgical and cytopathology under appropriate supervision. In addition, the fellow will learn to assist the radiology staff during the performance of aspirations under CT, fluoroscopy, and ultrasound. The fellow will learn cytopreparatory techniques that will allow preparation and staining of aspirate smears and the fellow will learn to render a preliminary diagnosis at the time of FNAB. Intraoperative consultations (gross interpretations and FNAB) will be performed under the supervision of an attending pathologist.

In addition, the fellow will be responsible for the accession and review of all cytopathology consult cases and any surgical pathology consult cases during their rotation and all consult cases (both surgical and cytopathology) of the Director of Cytopathology. The fellow is responsible for obtaining the appropriate clinical information on both in-house and consult cases. The fellow will then present these cases to the attending pathologist or the Director of Cytopathology. Because many of the FNAB's are preformed in surgery/oncology clinics, the fellow will have the opportunity to examine patients and see various cancers and treatment effects in conjunction with oncology staff and residents of the Departments of Medicine and Surgery. In addition, the immediate interpretations provided by fine needle aspiration biopsy allow the Cytopathology fellow to directly participate in the patient management.

Teaching
The fellow will receive direct teaching sessions from the attending staff during daily sign out and will review difficult or interesting cases with the Director of Cytopathology. The cytotechnologists also participate in the training of fellows. They are available to discuss cases they have screened. The fellow also has the opportunity to attend various review sessions/workshops presented to the cytotechnology students by the SUNY Upstate Cytopathology Laboratory as well as cytotechnology affiliates. These informal and structured didactic sessions are supplemented by the required conferences listed on page 4.

The fellow is required to attend and participate in the didactic specialty surgical and cytopathology conferences (1 every month) and the surgical pathology unknown conference (1/week). In addition, the Department sponsors a monthly Pathology Rounds and a Research Seminar that provides greater diversification in Pathology education. The fellow is also required to attend the monthly administrative lab meetings – to gain management experience. These meetings will be supplemented by practical instruction in laboratory management and quality control and assurance by the Director as well as the Supervisor of the Cytopathology Laboratory.

The fellow has primary responsibilities in the Cytopathology conference. The fellow will attend weekly oncology conference (tumor board) as needed. Specific cases are selected by the oncology service. Prior to this conference, the cases to be presented will be reviewed with staff (Dr. Khurana). During the conference the fellow will review all relevant cytopathology and conclude with a brief clinicopathologic discussion. The fellow will also be responsible for the organization and implementation of a one-hour, monthly cytopathology conference for residents, cytotechnologists and interested staff. This may include presentation of interesting or unknown cases, selected topics or didactic sessions. Once the fellow selects the format of the particular conference the Director will assist the fellow as necessary to select the cases and review the cases/kodachromes prior to the conference. The Director will be present during the conference. The Director and cytopathology staff will also present 1 conference every month which may include unknown cases. The fellow is expected to attend this conference or didactic lectures.

The fellow will supervise and function as a consultant for the first and second year pathology residents as well as any surgical residents, gyn residents, or medical students in training during their rotation on surgical and/or cytopathology. The fellow will also act as a consultant and primary reviewer for pathology residents rotating on cytopathology. The fellow will also be responsible for teaching residents the fundamentals of cytopathology as it relates to neoplastic and preneoplastic conditions. In addition, the fellow will assist in preparing and presenting lectures to undergraduate students in the School of Cytotechnology on various topics as deemed appropriate by the Medical Director.

Research
The fellow will have the opportunity to investigate any one of a number of research projects during the year and will have the opportunity to learn and use a variety of research tools/techniques such as flow cytometry, electron microscopy, immunochemistry, molecular diagnostic techniques, and polymerase chain reaction (PCR). The fellow will be assigned a small project under the supervision of a staff member or may elect to pursue at least one Clinico-pathologic project of choice. The fellow will be strongly encouraged to submit the results of the research for presentation at a national meeting as well as for publication. The fellow will be given departmental support to attend and present at these meetings. In addition, the fellow will learn photomicrography and the techniques of scientific writing and oral presentation.

Administrative Experience
The fellow is involved in the activities (management, QA etc.) during his/her entire training program. The fellow learns how to initiate an FNA program and the latest government and state mandated regulations by participating in the monthly QC and QA activities of the Cytopathology laboratory. Specifically the fellow reviews all cyto/surgical pathology correlations monthly for the QA report; his/her evaluations are then reviewed by the Director and Laboratory Supervisor before finalization. The fellow is encouraged to handle clinician interactions, both concerns/complaints that involve Cytopathology. These interactions are monitored by the Director either by prior or subsequent discussion - depending on the level of responsibility attained by the fellow and/or the severity of the problem. The fellow attends Laboratory meetings where he/she encounters the problems and concerns of the staff in a "working" Cytopathology Laboratory. Management seminars, predominantly in July and August, are provided for residents and staff.

Evaluations
Written evaluations of the fellow are solicited from each attending on a semi-annual basis using a standardized form. The program director discusses the overall evaluation with the trainee bi-annually.

Trainees are asked to evaluate each rotation using a standard form or a computerized evaluation form. Trainees are also regularly given feedback by attendings concerning their strengths and weaknesses.

The program director also encourages the trainee to comment formally on the value of each part of the program in the evaluation form. Fellow also evaluates the faculty in the evaluation form. The suggestions are considered by the faculty and implemented insofar as they are feasible and will improve the program.

HEMATOPATHOLOGY FELLOWSHIP

Katalin Banki, MD - Director

The fellowship is designed for a one-year period. The year is primarily devoted to acquiring skills in morphology and laboratory hematology. The trainee interacts closely with other trainees in the AP/CP residency program and provides first back up to residents on call for hematology problems. Trainees are encouraged to participate in autopsy, surgical pathology, and other specialized pathology conferences. The teaching schedule is extensive with at least one program on most days of the work weak. The trainee participates in hematologic consultations with all sections of pathology (autopsy, surgical, renal, neuro, immuno, cytology, blood bank, molecular, etc.) A "Service Review" conference on Mondays covers all aspects of Clinical Pathology. During the fellowship, the trainee is also encouraged to take one or two months of training in clinical hematology/oncology.

The program is outlined as follows:

Basic laboratory hematology, ongoing throughout the year: learn clinical hematology laboratory operation and management, including quality control, methodologies, troubleshooting, reviewing abnormal blood films, and interfacing with clinicians on laboratory problems.

Bone marrow laboratory, 3-5 months: Examine patient specimens of bone marrow and blood, write reports with interpretations, and sign out cases with the attending hematopathologist; learn cytochemistry methods and interpretations; serve as liaison with clinical hematologists.

Cell marker laboratory and lymph node pathology, 2-3 months: Learn techniques of flow cytometry and immunocytochemistry in order to determine cell phenotypes in blood marrow and lymph node specimens; examine lymph node sections; write descriptive reports and interpretations; correlate cell marker studies with morphology; sign out cases with attending hematopathologist; review molecular study results and serve as liaison with clinical hematologists.

Special hematology, coagulation, and hemostasis, 2-3 months: Learn laboratory methods used in the diagnosis of thalassemia and hemoglobin disorders, hemolytic anemias, thrombotic and hemorrhagic disorders; interview patients; interpret data from patient studies; write consultation reports; sign out cases with attending hematopathologist; serve as liaison with clinicians.

Cytogenetics and Molecular diagnostics, 2 months: Learn basic techniques of Karyotyping, FISH & PCR as they relate to Hematology; correlate with morphology and immunophenotype. Present a teaching seminar.

Research or Electives, 1-2 months: Options include: a concentration in one of the above areas to further develop skills; engaging in investigations in one of the above areas in collaboration with one of the attending hematopathologists or other scientists; planning and beginning a research project, under the guidance of a faculty member.

Core Curriculum

Bone Marrow Aspirates/Biopsies: Initially, trainees are instructed in collection of bone marrow specimens, slide making, and performance of Wright and peroxidase stains. During the first week, they are evaluated and/or instructed in peripheral blood and bone marrow differential counting by the technical supervisor. Marrows are assigned to trainee and resident on alternating basis. Peripheral blood (200 cell) and bone marrow (500 cell) differentials are performed, CBC analyzed, all cell lines examined and described on Wright stain. Cytochemistries are ordered, evaluated and counted as appropriate. Biopsies and clot sections are examined and special stains (and immunocytochemistries) obtained. For each aspirate there is an accompanying biopsy or clot section that is reviewed at the same time. Ancillary studies are also coordinated (cytogenetics, flow cytometry, molecular studies, etc.). The trainee writes up the case, formulates a diagnosis and presents to an attending at multiheaded microscopes. With experience, the trainee gradually increases in responsibility for cases, assists supervision of residents, and gains some independence, although attendings must review all cases and decisions.

The trainee is expected to perform at least three procedures (usually 6-10) if previous experience during residency training is not documented. Routine bone marrow procedures are performed by the clinical services. Arrangements have been made, therefore, for trainees to spend elective time at the Regional Oncology Center (outpatient) to see patients and perform procedures, or, alternately, to elect a rotation in inpatient hematology/oncology.

Lymph Node Biopsies: Trainees on-service review all lymph nodes from anatomic pathology in consultation with the AP resident and attending. They are consulted at the time of gross specimen submission regarding processing for paraffin sections, flow cytometry, molecular studies etc. These and all outside consultations, as well as peripheral blood and bone marrow submitted for immunophenotyping are evaluated and described. Special studies are ordered and interpreted. A diagnosis is made and the case is reviewed with the attending.

The trainee, when on the service, is responsible for evaluation of all cases, supervises and assists in technical work (processing, staining, obtaining special studies) evaluation of histology, flow cytometry and molecular studies, and formulates a diagnosis.

Cytochemistry, Immunochemistry, Flow Cytometry, Molecular Biology: Cytochemistries are usually performed in the Bone marrow/Peripheral blood morphology service. Immunochemistry and flow cytometry are part of hematopathology/Immunophenotyping. Trainees are responsible for screening incoming cases, suggesting appropriate studies, including immuno- and cytochemistry, gene rearrangement and cytogenetics, selecting blocks and specimens, and deciding flow panels in consultation with the referring clinician and the attending hematopathologist. The trainee then scores each immuno/cytochemical smear, reviews graphs of dual-labeled flow cytometry and generates a written report that will be signed out with the attending. The trainee informally reviews molecular studies of hematology cases.

General Hematology: The trainee attends regular staff meetings of the hematology section and core laboratory along with pathology attendings and technical coordinators. Trainees have full knowledge of regular operational issues and may be assigned tasks to solve ongoing problems. Unexpected differential findings or other results of potential clinical importance is presented to the trainee who confirms and reports the findings to the clinician.

Coagulation: The trainee is responsible for coordinating the entire coagulation consultation, in conjunction with the attending pathologist. This includes initially assessing history from the patient and /or referring physician, and formulating a testing strategy, following the test result development--including making alterations of the test strategy based on unanticipated results, organization of the test results, formulation of a diagnosis/recommendations, finalization of a report, and often direct communication back to the referring physician.

Red Cell Disorders: The trainee follows the same sequence of steps as described above for coagulation. The trainee indeed reviews the peripheral smear, HPLC, electrophoretic, RBC enzyme, and all other specialized assays. The trainee actively compares any unusual patient results with the biomedical literature in the process of writing up the case. All special hematology reports are first written by resident then signed out with attending pathologist.

Cytogenetics: One month required, within the cytogenetics laboratory of the Department of Pathology, under Dr. Constance Stein. Cytogenetic test requests and correlation of results are incorporated into bone marrow and lymphoid tissue examinations.

Molecular Diagnostics: One month required. While on Hematopathology rotations, the trainee correlates molecular pathology results that may pertain to the hematology patient. For example, all Factor V Leiden patient results are reviewed at the time of Special Hematology sign-out of that patient. Similarly T- and B-cell clonality assays are reviewed in the context of bone marrow, lymph node or other examinations.

Educational: The trainee, with increasing level of experience, has a graduated responsibility to assist, supervise and instruct residents accompanying them on their hematology services. He/she is responsible for orientation and basic training of new residents on the service. On-call residents attempt to contact the hematology trainee, whenever a difficult hematology problem should be solved.

The trainee schedules and contributes to bi-weekly Hematopathology seminars for residents. Trainees present at least two seminars during their one-year fellowship.

Trainees participate in medical student instruction including preparation for and participation in laboratory session and evaluation of student performance.

Evaluations

End-of-rotation evaluation by faculty and semi-annual evaluation by the program director. Trainees are also asked to evaluate each rotation and the program. The program director also encourages the trainee to comment informally on the value of each part of the program. The suggestions are considered by the faculty and implemented insofar as they are feasible and will improve the program.

SURGICAL PATHOLOGY FELLOWSHIP

Program Demographics:

Name of Host Institution: SUNY Upstate Medical University
Program Specialty/Subspecialty: Anatomic Pathology/Surgical Pathology
Program Address: 750 East Adams Street, Syracuse, NY 13210
Program Phone Number: (315) 464-4670
Program Fax Number: (315) 464-4675
Program E-mail: delarozg@upstate.edu
Program Director: Gustavo de la Roza, MD

Introduction:

History: The Surgical Pathology Fellowship has been in existence since 1974 with one to two individuals per year. Recent graduates have gone on to both private practice and academic positions.

Duration: 1 year

Prerequisite Training/Selection Criteria: Three years of AP or 4 years of AP/CP are required.

Goals and Objections for Training:

- Increase knowledge of general Surgical Pathology.
- Become confident with frozen section diagnoses.
- Enhance teaching skills by supervising medical students and junior residents and presenting resident teaching conferences.
- Become familiar with use of ancillary techniques (immunohistochemistry and molecular techniques) in biopsy diagnoses.
- Perform an in-depth study in a subspecialty area of Surgical Pathology with potential for publication.

Resources:

Teaching Staff:
Gustavo de la Roza, MD
Ola El-Zammar, MD
Christopher Curtiss, MD
Joseph Fullmer, MD, PhD
Kamal Khurana, MD
Alfredo Valente, MD
Shengle Zhang, MD
Qun Wang, MD
Rana Naous, MD
Kerry Whiting, MD
Rohin Mehta, MD

Facilities: All rotations will be administered in the Department of Pathology at SUNY Upstate Medical University.

Educational Program:

The surgical pathology division accessions approximately 14,000 cases annually.
The material comprises a wide spectrum of interesting cases covering all specialties including bone, breast, GI, Ob-Gyn, pulmonary, hematopathology and soft tissue. Both neoplastic and non-neoplastic diseases are well represented, and there is also a busy pulmonary pathology outside consultation service. The diagnostic service is supported by an active immunohistochemistry laboratory and a state of the art molecular diagnostics laboratory.

The fellow duties will include cutting in daily Surgical Pathology cases and signing them out with an attending staff pathologist, performing frozen sections under the supervision of a staff pathologist, supervising residents and medical students in the Gross Room, organizing cases for the weekly Surgical Pathology slide conference, presenting cases at inter-departmental conferences (Oncology Conference, GI Conference, Breast Conference, etc.), and reviewing and diagnosing outside referral cases with an attending pathologist. The fellow will also present two resident teaching conferences covering assigned surgical pathology topics. Two months will be available for research and/or subspecialty rotation.

Evaluation:

The fellow is evaluated by attending pathologists following each rotation. The evaluations and the fellow's progress are formally reviewed with the Program Director after six months and at the end of the fellowship.

TRANSFUSION MEDICINE

Zhanna Spektor, MD – Director

Philosophy

The philosophy of the Blood Bank/Transfusion Medicine program is excellence in patient care (most cost-effective, efficient and highest quality) as a foundation for graduate medical education and research/scholarly activities. Progressive assumption of responsibility with appropriate supervision at each level and self-directed learning are key to life-long learning and professional career development.

Goals

1. Acquire a broad base of knowledge, skills, experience and understanding in contemporary Blood Banking and Transfusion Medicine (BB/TM).
2. To make good decisions reflecting sound judgment and accountability to patient and patient's physician in the practice of BB/TM.
3. Acquire skills, knowledge and understanding of leadership and management in all aspects of Transfusion Medicine.
4. Acquire proficiency in computer and Internet with competency in communication (access and review information), spreadsheet (i.e. Excel) and database management (i.e. FileMaker Pro and/or Access), as well as PowerPoint.

Objectives

1. At the completion of the program, the fellow should be capable of communicating/assisting clinical colleagues, solving technical and clinical problems that arise day-to-day and be able to offer consultation in hemotherapy (components), progenitor (stem) cell collection/processing, respond to transfusion reactions, alloantibody identification, hemapheresis consultations, contribute to parentage analysis, interface with Bone Marrow/Peripheral Blood Progenitor Cell Transplantation Heme-Onc service and solid organ transplant surgery team, appreciate selection of organ donors (living/cadaver), assessment of waiting list, crossmatch and status of PRAs (percent reactive antibodies) including platelet refractoriness of patients.

   The overall program is designed to provide the trainee with a thorough, comprehensive experience in all aspects of Transfusion Medicine. The ultimate goal of the program is for the fellow, upon completion of training, to have the skills and knowledge necessary to provide direction and support to a Transfusion Medicine Service in its entirety.

2. Attain competency in the science and practice of transfusion medicine to appreciate, anticipate, translate and adapt to change in future science and practice of Transfusion Medicine.
3. Be prepared and able to pursue a career in BB/TM as a physician-scientist, clinician, medical educator, leader/manager oriented to scholarly work with an inquiring mind and commitment to the patient first and foremost.

Duties and Responsibilities

Resident on rotation is to introduce him/herself to the Supervisors of the three main service areas of Transfusion Medicine (Blood Bank, HLA, and Apheresis) on the first morning of the rotation.

Daily:

1. Organize and attend rounds for blood component utilization and sign out of reports at 1330 hours, Monday-Friday.

2. Review the blood component utilization from previous day (and present at 1330 hours in conjunction with the blood component order (BCO) form.
3. Present copy of current day's surgery schedule for review of associated blood component orders to anticipate needs and balance with inventory.
4. Present follow-up reports on queried/interesting cases from prior review and returns versus orders, noting blood returns, in connection with previous day's scheduled surgery list.
5. Present reports for sign-out:
    A. antibody reports (within 24-48 hours)
    B. transfusion reaction reports (within 24-28 hours)
    C. HLA antigen/antibody typing reports (when ready)
6. Review and respond to all pre-transfusion blood product requests and especially pre-admission testing orders (PAT) to ensure compliance with the Guidelines for Ordering Blood regularly when contacted by technologists.
7. Complete Blood Utilization Review (BPUR) forms on the computer for queried cases (on Drive H). Document all interactions with and responses from clinicians regarding blood product ordering.

Blood Bank

1. Take calls from blood bank technologists and respond promptly
2. Schedule Immunohematology Benchwork with the BB supervisor (usually afternoons).

HLA/Tissue Typing Lab

1. Take calls from technologist when contacted
2. Anticipate living donor solid organ transplants
3. Schedule benchwork/demonstration with supervisor after initial month of TM rotation

Apheresis Service

1. Evaluate apheresis requests, obtain consent, ensure that placement of vascular access device is undertaken or has been requested. Evaluate patient and write orders notes in patients' charts (pre-, mid-, post-procedure).
2. Attend pheresis procedures (pre- and post-)

Education

1. Review of blood component utilization and sign out of transfusion reactions form the basis for instruction and teaching in Hemotherapy.
2. Sign-out antibody reports with appropriate review of corresponding blood group system form the basis for teaching in Immunohematology.
3. Review of surgery schedule and evaluation information/communications from ARC form the basis for instruction in blood component inventory management and procurement.
4. Review sign-outs of HLA antigen typing/antibody screen/detection, deceased and living donor and recipient transplantation, and B27 reports are the basis for instruction in Transplantation Medicine.
5. Follow and monitor at least one solid organ transplantation through hospitalization.
6. Participate in progenitor cell infusion for at least one patient.
7. Apheresis education is conducted on site on the Apheresis floor.
8. Follow daily interesting/instructive patients relevant and be prepared to update daily.
9. Hands-on benchwork forms basis of instruction for routine blood bank procedures.

Core Curriculum

SUNY Upstate Medical University (10 month rotation)

Bench procedures such as serologic tests for hepatitis, AIDS, cytomegalovirus, and syphilis.

Over the initial two months, the fellow learns routine Blood Bank procedures. This part of the training includes performing procedures and review of case studies as examples of problem-solving techniques. The rotation includes:

1. Learn procedures and become proficient in typing, crossmatching and screening for and identifying irregular antibodies of donor and recipient blood.

2. Learn procedures in immunohematology and become proficient in the detection and identification of irregular antibodies, incorporating antibody panels, absorption/elutions procedures, titers, neutralizations, enzymes and pre-warming techniques.

3. Communicate results of crossmatch problems to clinicians and recommend solutions.

4. Obtain relevant clinical information on patients with complicated irregular antibodies and transfusion reactions

5. Meet with the immunohematology technologist and supervisor to review work-ups and prepare reports on antibody and transfusion reactions consultation.

6. Sign-out immunohematology reports with Blood Bank attending or Director BB/TM.

The fellow will be involved in testing of blood samples in our Immunology Laboratory. He/she will become knowledgeable in EIA testing (HBsAg, anti-HBc, anti-HCV, anti-HIV, and anti-HTLV), latex agglutination (CMV antibody), RPR for syphilis testing. There will be a thorough understanding of test result interpretation, as well as quality control issues.

Donor collection (medical history, collection of blood, recruitment of donors, preparation of components).

During the first three months also, the fellow becomes familiar with the steps used to prepare blood for transfusion including pooling products, aliquoting products, irradiation of blood components, thawing frozen components and leukodepletion. Other aspects are covered during the rotation at Red Cross.

Therapeutic apheresis and therapeutic phlebotomy (see the patient and write a consultation note?)

The fellow works in the first month with the attending physician, coordinator and nursing staff to learn about hemapheresis procedures. The rotation is designed to give the fellow increasing responsibility for this service and be prepared to learn in subsequent months from less frequently encountered diseases in patients. Activities include:

1. The fellow will become familiar with all technical procedures of the hemapheresis section including progenitor (stem) cell collections, therapeutic plasma exchange, white cell and platelet reduction, red cell exchange, plasma volume calculation, and fluid balance.

2. Under the direction of the hemapheresis attending, the fellow will achieve proficiency in evaluating hemapheresis patients, writing orders, responding to clinical problems and providing patient management during and between procedures, especially in patient reactions during procedures.

3. Initially, the fellow will remain with the patient throughout the procedure to familiarize herself/himself with all aspects of medical/nursing care.

4. The fellow will assume progressive responsibility for the management of hemapheresis patients and share coverage with the pathologist attending for off-shift therapeutic procedures.

5. Under the supervision of the Nurse Coordinator of the Apheresis Service, the fellow will become familiar with hemapheresis catheter care, trouble shooting, and instrument problem identification and solving.

6. Following completion of his/her training, the fellow will be competent in managing all aspects of hemapheresis therapy both technical and clinical.

7. The fellow will achieve an understanding of the goals, strategies, and problems related to peripheral blood progenitor collection. She/he will interact with the appropriate clinician regarding problems in this area and CD34 cell target attainment.

Transfusion reactions (see the patient, perform the evaluation, write the consultation note?)

The fellow will be involved in transfusion reactions reported to the Blood Bank. His/her responsibilities include:

1. Evaluate acute transfusion reactions. See patients immediately with suspected hemolytic transfusion reactions. Review Blood Bank work-up and request additional studies if indicated.
2. Oversee the Blood Bank resident in performance of the above when resident is on service.
3. Complete transfusion reaction report forms for attending counter-signature within 24 hours.
4. Enter note in patient's chart of preliminary report and any recommended action or follow-up.
5. Make recommendations for use of special components (i.e., filtered, washed cells or premedication).
6. Complete a delayed hemolytic transfusion reaction form on patients who develop an alloantibody or positive direct antiglobulin test within three months of a transfusion.
7. Follow-up suspected cases of post-transfusion hepatitis. Gather necessary clinical and transfusion information and prepare report for Red Cross. Follow-up with Red Cross and attending physician.

8. Gather data for look-back requests and related New York State and FDA as appropriate.

American Red Cross Blood Services, New York/Penn Region Red Cross (Four weeks in Rochester at regional site and at Syracuse Donor and Dispensing Center)

Bench procedures such as serologic tests for hepatitis, AIDS, cytomegalovirus, and syphilis.

Testing for infectious disease markers, with the exception of stat testing for CMV antibody, is done off-site in either Dedham, MA or Detroit, MI. However, the trainee will be exposed to the processes of receipt of test results, updating of applicable computer files for release of blood for labeling and for tracking deferred donors in the donor deferral register and counseling of donors with positive test results.

Donor collection (medical history, collection of blood, recruitment of donors, preparation of components.)

With implementation of autologous blood donations at University Hospital in 2002, Fellow will be active in all stages of such donor blood processing on site. This will be supplemented and complemented through further involvement in all stages of blood collection at the regional Red Cross Center near Rochester and at the Syracuse extension.

This will include the organizing of mobile blood drives, being available for consultation with nursing staff regarding medical history questions, and managing donor reactions. The fellow will interface with the Donor Recruitment Department, and help in recruiting new blood drive sponsors. There are responsibilities in blood component preparation, including the making of packed red cells, platelet concentrates, fresh frozen plasma, cryoprecipitate, cryopoor plasma, leukocyte reduced blood components and donor hemapheresis products with emphasis on platelets. The fellow will become familiar with the methods of washing and freezing red cells. He/she will learn the appropriate indications for the use of the products. Donor hemapheresis emphasizing platelets but also granulocytes will be stressed in all aspects of patient care, collection and processing.

Therapeutic apheresis and therapeutic phlebotomy (see the patient and write a consultation note?)

The fellow will learn the indications and contraindications of therapeutic hemapheresis, will consult with attending physicians, will see and evaluate new hemapheresis patients, and write consultation and progress notes in the patient chart. He/she will gain experience in handling adverse reactions. The fellow will evaluate new therapeutic phlebotomies and, at times, participate in the procedure.

Crouse Hospital (four weeks)

In this special BB/TM environment, the resident/Fellow will learn the following:

1. Pathophysiology of anemia in the unborn and newborn.
2. Laboratory investigation and clinical management of newborn with
    a. Hemolytic Disease of the Newborn and most likely etiology in terms of antibody specificity (ABO vs irregular)
    b. Platelet alloimmunization
    c. Prematurity and iatrogenic anemia with special attention to preservation and transfusion aliquoting.
3. Application, utilization, and preparation for intrauterine transfusion in unborn perinatally and exchange transfusion in newborn.
4. Antibody development/management in pregnant women.
5. Transfusion reactions, nature and prevalence, in newborns and pregnant women.
6. Graft vs. host disease in premature infants and newborns and relation to blood product transfusions.
7. Special blood products and their preparation for premature and newborn infants including CMV negative, HLA matched, leukodepleted, washed erythrocytes and leukocytes and irradiation.

Name of Conference	Frequency	Department Responsible
Blood Bank Conference	2 per month - Tues 0800	Pathology/ TM
Hematopathology Conference	2 per month - Tues 0800	Pathology/Hematology
Hematology-Oncology Conf.	Weekly - Thurs 1100	Medicine
Pathology Research Conf.	2 per month	Pathology
Service Review	Weekly - 1100	Pathology
Management Seminar	10 sessions	Pathology
AABB/ASCP Teleconferences	6 per year - Wed 1300	Transfusion Medicine
Renal Transplant/Dialysis	Weekly – Fri 0800	Surgery/Medicine
Bone Marrow/Progenitor (Stem) Cell Conf.	Weekly - Weds 1500	Medicine/ Hematology-Oncology

The fellow is expected to attend/participate in all of these conferences on a regular basis during appropriate rotations. With the Director or Associate Director of BB/TM, he/she plays a leadership role for the BB conference by teaching, leading the discussion and providing assistance to the pathology residents and staff. This is also true for the AABB teleconference series.

There are many other conferences sponsored by the department as well as other departments of University Hospital available to the fellow depending, on their interest. Medical Grand Rounds is strongly recommended.

Method of Evaluation

Six Competencies:

Medical Knowledge
Evaluated in two ways: Chart Stimulated Recall Oral Examination and Portfolios (case logs).

Chart Stimulated Recall Oral Examination: Patient cases of the examinee (resident) are assessed in a standardized oral examination. The attending physician questions the resident about the case provided, probing for reasons behind the work-up, diagnoses, interpretation of clinical findings, and treatment plans.

Portfolio: A portfolio will include a log of clinical procedures performed; a summary of the research literature reviewed when selecting a treatment option and statements about what has been learned, its application, remaining learning needs, and how they can be met.

Practice-Based Learning & Improvement
Evaluated in four ways: Portfolios, Global Rating, Surveys and 360 degree evaluations.

Portfolio: Please see explanation under Medical Knowledge.

Global Rating: A rater judges general categories of ability (patient care skills, medical knowledge, interpersonal and communication skills) and the ratings are completed retrospectively based on general impressions collected over a period of time (end of rotation) derived from multiple sources of information (direct observations or interactions); input from other faculty, lab technicians and residents and review of work products or written materials.

Surveys: Surveys will be distributed to those individuals the resident lectures to (students, nurses, etc). They will address the quality of the lecture, preparation of the lecture, etc.

360 degree evaluation: An evaluation for the resident on service is completed by superiors, peers, subordinates, technical staff, etc. The ratings are summarized for all evaluators by topic and overall to provide feedback.

Interpersonal & Communication Skills

Evaluated in two ways: Checklist and 360 degree evaluation.

Checklist: consists of essential specific behaviors, activities and/or steps that make up a competency component. A check mark indicates that the behavior occurred or options to indicate the completeness or correctness of the action. The forms provide information about behaviors but for the purpose of making a judgment about the adequacy of the overall performance.

360 degree evaluation: Please see explanation under Practice-based Learning & Improvement.

Professionalism

Evaluated in one way: 360 degree evaluation.

360 degree evaluation: Please see explanation under Practice-based Learning & Improvement.

Systems-Based Practice

Evaluated in two ways: Chart Stimulated Recall Oral Examination and 360 degree evaluation.

Chart Stimulated Recall Oral Examination: Please see explanation under Medical Knowledge.

360 degree evaluation: Please see explanation under Practice-based Learning & Improvement.

Patient Care

Evaluated in two ways: 360 degree evaluation and Portfolios.

360 degree evaluation: Please see explanation under Practice-based Learning & Improvement.

Portfolios: Please see explanation under Medical Knowledge.

LEARNING RESOURCES

Reference libraries are available in the resident areas and sign-out areas, containing many of the current major resources, and that there is a mechanism is in place to keep the references current through the residency program office.

AP Sign-out library: Books may be reviewed only in the sign-out room.

Teaching Sets: Teaching sets are available in both AP and CP.

RESEARCH AND TEACHING OPPORTUNITIES

The residents are exposed to an environment, which values a scholarly approach to the problems of pathology and disease and are encouraged to participate in this through opportunities for teaching and clinical or basic research. Research projects may develop as a result of pursuing in-depth studies on subjects in which the resident has a special interest, or may emerge during rotations in the various services. Each resident is strongly encouraged to pursue pathology practice and training intellectually, with curiosity and imagination, and, as appropriate, to submit manuscripts for publication during his/her residency training. This is considered a valuable learning experience and an important part of the residency program, regardless of the eventual practice setting for the individual resident. The work may be related to methods development, clinical or basic research, or reviews.

Residents are required to participate in some of the teaching activities of the Department of Pathology. This includes teaching of medical students on elective rotations in Pathology and of fellow residents through presentations at Journal Club and various intradepartmental and intradepartmental conferences.

Teaching Responsibilities

Residents are required to participate in the teaching programs of the department. Residents will assist in teaching the Cytotechnology students.

Presentations at Professional Meetings

Residents are encouraged to present papers or poster sessions at local or national meetings or proceedings of various research or professional societies. Residents will find the annual and semi-annual meetings of the US - Canadian Academy of Pathology, The American Society of Clinical Pathologists, the College of American Pathologists, and other Pathology and Laboratory medical organizations appropriate for most oral and poster presentations (see also Business Leave) to refer to the details about meetings.

APPENDIX

INSTITUTIONAL GUIDELINES AND POLICIES

The following policies are included in this edition of the Pathology Residency Manual. These have been extracted from the general policy manual provided to all residents and fellows at SUNY Upstate. The policies put into this manual do not supersede those in the general manual. They are provided herein for your convenience.

SUNY Upstate Medical University
Syracuse, New York

Guidelines and Policies, Office of Graduate Medical Education
Section: Standard Operating Procedures for the Evaluation and Termination of Residents

I. PURPOSE

It is the responsibility of each of the Departments at SUNY Upstate to develop admission criteria, evaluation procedures and standards of performance that reflect the unique objectives and practice/training environment of that program. This diversity of emphasis is a strength of the institution. This procedure is intended to guide program directors, faculty and administrators in the application of procedures, consistent with law and ACGME requirements governing key decisions regarding residents in graduate medical education programs. The SUNY Upstate Medical University Office of Graduate Medical Education will serve to monitor, oversee and facilitate individual departments' compliance with institutional ACGME, and RRC specific guidelines for due process. The term "resident" as used in this document encompasses all individuals in all postgraduate medical education positions.

II. Evaluation Process

A. Professional Standards and Evaluation

All residents are expected to conform to Standards of Professional Conduct, and Professional Ethics. All residents shall comply with the campus policy on anti-discrimination and civility. Alleged violations of these policies and/or misconduct as defined in Section 6530 of the New York State Education Law may be grounds for probation or suspension pending a final determination. A finding of violation of these policies and/or misconduct may be grounds for disciplinary action including probation, suspension, or termination and reporting to the New York State Office of Professional Medical Conduct as required by law. All determinations regarding unprofessional behavior shall be fully supported by the Department. Upon a recommendation by the Department to the Associate Dean of Graduate Medical Education, probation, suspension or termination may be imposed. The resident shall be notified in writing of the determination, and the right to appeal. If a report has not already been made, absent an appeal, or following the sustaining of adverse action following an appeal, a report shall be made to the New York State Office of Professional Medical Conduct. A pending charge of unprofessional behavior does not preclude Upstate Medical University from non-renewing the resident at the end of the appointment under any circumstances.

B. Academic Standards and Evaluation: Routine Procedures for All Residents

The primary responsibility for defining the standards of academic performance and personal professional development rests with the individual Departments and program directors based on ACGME standards. When, a resident's performance is not adequate, notification of the deficiencies

must be made, in writing to the resident by the program director with copies to the Dean for Graduate Medical Education. A plan to correct deficiencies, which include the manner and time frame in which the deficiencies will be corrected, and the consequences of not correcting the deficiencies within the time frame, should be a part of this notice. There may be a specific probation period, before a decision is made to recommend termination of a resident for academic performance, except that a resident on academic probation may be non-renewed at the end of the appointment under any circumstances.

1. Criteria

A. Depending upon the program, performance criteria may include cognitive objectives, skills (credentialing requirements), and patterns of behavior indicative of professional attitudes. They should be clearly defined and given to the resident in written form.

B. Criteria must be reasonable and related to patient care and the practice of medicine. They should include evidence of satisfactory progressive scholarship and professional growth including demonstrated ability to assume graded and increasing responsibility for patient care.

2. Assessment and Notification

A. At least semiannually, the program director and faculty of each program should use appropriate procedures and criteria to evaluate the knowledge, skills and professional growth of its residents. The results of the evaluation should be in writing and communicated to each resident in a timely manner and the record of the evaluation should be accessible to the resident. The program director must provide a final evaluation for each resident who completes the program. The evaluation must include a review of the resident's performance during the final period of education and should verify that the resident has demonstrated sufficient professional ability to practice competently and independently. The final evaluation must be part of the resident's permanent record maintained by the institution. A copy of this evaluation form will be distributed to the Office of Graduate Medical Education.

B. Supporting documentation such, as non-supervisory senior resident and attending physicians evaluation forms, as well as other appropriately solicited written comments, must be collected and maintained. These documents may be released to the resident only with the written permission of the non-supervisory evaluator.

C. Residents should be advanced to positions of higher responsibility only on the basis of an evaluation of their knowledge, ability and readiness to cope with increased responsibility and professional comportment.

III. Remediation

A. Recommendations for remedial action and consequences of continued deficiency should be clearly defined for the resident in writing in each individual case. A copy of the notification to the resident should be submitted to the Graduate Medical Education Office.

B. A reasonable timetable for corrective action by the resident should be established. Absent extraordinary circumstances, this should be a period of at least three months.

C. If remedial action does not result in satisfactory performance, notifications of continued deficiency on the part of the resident and the consequences, (i.e., probation, suspension, or proposed termination) should be provided **in writing** to the resident and to the Office of Graduate Medical Education.

D. All informal and formal meetings with the resident related to deficiencies should be documented with dated notes or memoranda to file.

IV. Non-renewal & Termination

A. A resident may be non-renewed at the end of the **term of their appointment** for **any non-discriminatory** reason. Such decision is not subject to appeal nor grievance procedures.

B. If based on inadequate academic performance, termination prior to the academic year is being considered, the Program Director will notify the Associate Dean of Graduate Medical Education to discuss the findings and recommendations of the Program Director and faculty of said department. (The Associate Dean may consult with legal counsel and the Human Resources Department to discuss these findings).

C. If based on conduct which violates the Standards of Professional Conduct and/or Professional Ethics, and/or which is deemed to be a danger to patients and termination prior to the end of the academic year is being considered, the Program Director will notify the Associate Dean of Graduate Medical Education to discuss the findings and recommendations of the Program Director and faculty of said department. (The Associate Dean may consult with legal counsel and the Human Resources Department to discuss these findings).

D. After consultation with GME, the Program Director then notifies the resident of his or her **recommendation** regarding termination. The notice will advise the resident that they may appeal the termination decision by requesting a review within 10 business days of the notice from the Office of the Dean of GME.

E. If termination prior to the end of the academic year is considered based on the belief that a resident is impaired and/or his/her performance is a threat to patients and or staff, the resident **may** be suspended from all patient care responsibilities pending a **final** determination **regarding appropriate action**.

V. Appeal Process

A. There is no appeal for non-renewal of temporary appointment.

B. If a resident would like to appeal a termination decision prior to the end of the academic year of his/her Program Director, the resident should make a written request for such to the Associate Dean for Graduate Medical Education. Such request must be made in writing within 10 working days of termination.

1. The Office of Graduate Medical Education will select a three-member panel consisting of members of the Graduate Medical Education Committee. The members of this panel will consist of one resident and two program directors, not from the petitioning resident's department. The date set will not be adjourned absent extraordinary circumstances.

2. A hearing will be scheduled within 30 days of termination. The Program Director of said department, or his or her designee, will present the case for termination. The resident is afforded the opportunity to bring witnesses to this hearing and any documentation s/he deems appropriate. The resident may have an advisor who may be present, but may advise the resident only and not participate in the hearing. Witnesses may make statement by telephone, and their non-availability shall not per se, be grounds for adjournment. Failure of the resident to appear shall result in forfeiture of the right to question the Department witnesses.

3. The three member panel will render a decision based upon the information provided. This decision will be transmitted via written correspondence to the petitioning resident, the Program Director of said department, and the Dean of GME within 10 working days of the hearing procedure.

4. If either party would like to appeal this decision, a formal letter within 10 working days should be sent to the Associate Dean for Graduate Medical Education. Failure to notify the Associate Dean within this time frame will terminate the appeal process at this point. The Dean of the College of Medicine will then make a final decision. The Dean of the College of Medicine will transmit his decision to the Associate Dean for Graduate Medical Education. The Associate Dean will transmit in writing to the petitioning resident and the Program Director of the relevant department this final decision.

5. Copies of the notification letter are sent to the Program Chairperson, the Dean of Graduate Medical Education, the Director of the Office of Human Resources and Employee Relations and the University Hospital Medical Staff Office.

6. Upon receipt of a copy of a termination letter, the Program Chairperson will notify the program faculty as well as appropriate staff coordinators at affiliated hospitals that the resident in question is no longer authorized to be present or provide patient care in their facilities.

7. Upon receipt of a copy of a termination letter, the Dean of Graduate Medical Education will inform the Payroll Office of the date of suspension of pay. The Payroll Office will, in turn, inform the SUNY Central Office of Employee Relations and Human Resources of the change in the resident's status with a Form UP-2, *Notification of Professional Change of Status*. A Form PR-75, *Payroll Action Form*, with appropriate information regarding the resident is sent to Audit and Control in Albany.

VI. Reporting Requirements

A. The New York State Public Health Law requires that "Hospitals and other facilities approved pursuant to this article (PHL 2803-e) shall report or cause a report ot be made within thirty days of the occurrence of any of the following: suspension, restriction, termination or curtailment of the training employment, association or professional privileges or the denial of the certification of completion of training of an individual licensed pursuant to the provisions of title eight of the education law or of a medical resident with such facility for reasons related in any way ot alleged mental or physical impairment, incompetence, malpractice or misconduct or impairment of patient safety or welfare; the voluntary or involuntary resignation or withdrawal of association or of privileges with such facility to avoid the imposition of disciplinary measures; or the receipt of information which indicates that any professional licensee or medical resident has been convicted of a crime; the denial of staff privileges ot a physician if the reasons stated for such denial related to alleged mental or physical impairment, incompetence, malpractice, misconduct or impairment of patient safety or welfare."

B. Depending upon the specialty involved, the Residency Review Committee may require notification of the departure of a resident from the program. Program directors are advised to check with their RRC in this regard.

VII. Responding to Verifications for Residency

A. For those residents who have been terminated prior to the completion of their residency, requests for information regarding their tenure at SUNY Upstate Medical University should be addressed or redirected to the Office of Graduate Medical Education for completion.

B. All other requests for verification will be completed by the appropriate department or the Office of Graduate Medical Education.

ACGME PROGRAM REQUIREMENTS FOR GRADUATE MEDICAL EDUCATION IN PATHOLOGY

Graduate medical education programs in pathology are accredited in the following categories:

APCP-4	Four-year programs in anatomic and clinical pathology
AP-3	Three-year programs in anatomic pathology
CP-3	Three-year programs in clinical pathology
PCP-1	One-year programs in cytopathology
BB-1	One-year programs in blood banking/transfusion medicine
DP-1	One-year programs in dermatopathology
FP-1	One-year programs in forensic pathology
HMP-1	One-year programs in hematology
MM-1	One-year programs in medical microbiology
NP-2	Two-year programs in neuropathology
PP-1	One-year programs in pediatric pathology
IMP-1	One-year programs in immunopathology
PCH-1	One-year programs in chemical pathology
SP	One-year programs in selective pathology. Selective pathology programs are typically sponsored by institutions that provide unique educational resources in a specialized area of pathology.

I. Introduction

A. See above listing of programs.
B. Duration and Scope of Training
   1. Graduate medical education programs in anatomic pathology and/or clinical pathology must provide an organized educational experience for qualified physicians seeking to acquire the basic competence of a pathologist.
   2. Programs must offer residents the opportunity to acquire a broad understanding of anatomic pathology and/or clinical pathology, the techniques and methods of those disciplines, and the consultative role of the pathologist in patient-care decision making.
   3. APCP-4 programs are accredited to offer 4 years of education/training in anatomic pathology and clinical pathology, 3 years of training in anatomic pathology (AP-3), and 3 years of training in clinical pathology (CP-3).

4. APCP-4 programs must include 18 months of formal education in anatomic pathology and 18 months of formal education in clinical pathology. The remaining 12 months of training may be a continuation of structured anatomic pathology or clinical pathology education, or may be devoted to a specialized facet of pathology. AP-3 and CP-3 programs must include 24 months of anatomic pathology or clinical pathology education. The remaining 12 months of training may be a continuation of structured anatomic pathology and/or clinical pathology education, or may be devoted to a specialized facet of pathology. The education must occur under the direction of the program director or designated member of the teaching staff. The program director must clearly define, as part of the program description, the available opportunities whereby residents may accomplish the additional 12 months of pathology education. The program director must approve all such opportunities and monitor their progress.

II. Institutional Support of Graduate Medical Education

A. Sponsoring Institution

One sponsoring institution must assume ultimate responsibility for the program, as described in the Institutional Requirements, and this responsibility extends to resident assignments at all participating institutions. As other residency programs facilitate peer interchange and augment the breadth of the educational experience, institutions providing graduate medical education in anatomic pathology and/or clinical pathology should also sponsor at least three additional accredited residency programs. Programs in internal medicine, family practice, obstetrics and gynecology, general surgery, pediatrics, and radiology are considered to be most complementary to pathology education. Requests for exceptions to this requirement will be considered on a case-by-case basis.

B. Participating Institutions

1. Assignment to an institution must be based on a clear educational rationale, integral to the program curriculum, with clearly-stated activities and objectives. When multiple participating institutions are used, there should be assurance of the continuity of the educational experience.
2. Assignment to a participating institution requires a letter of agreement with the sponsoring institution. Such a letter of agreement should:
    a) identify the faculty who will assume both educational and supervisory responsibilities for residents;
    b) specify their responsibilities for teaching, supervision, and formal evaluation of residents, as specified later in this document;
    c) specify the duration and content of the educational experience; and
    d) state the policies and procedures that will govern resident education during the assignment.
3. Resident assignments away from the sponsoring institution should not prevent regular resident participation in rounds or conferences, either at the sponsoring institution or in equivalent conferences at participating institutions.

III. Program Personnel and Resources

A. Program Director

1. There must be a single program director responsible for the program. The person designated with this authority is accountable for the operation of the program. In the event of a change of either program director or department chair, the program director should promptly notify the executive director of the Residency Review Committee (RRC) through the Web Accreditation Data System of the Accreditation Council for Graduate Medical Education (ACGME).
2. The Program Director, together with the faculty, is responsible for the general administration of the program, and for the establishment and maintenance of a stable educational environment. Adequate lengths of appointment for both the program director and faculty are essential to maintaining such an appropriate continuity of leadership.
3. Qualifications of the program director are as follows:
   a) The program director must possess the requisite specialty expertise, as well as documented educational and administrative abilities, including at least 5 years of participation as an active faculty member in an accredited pathology residency.
   b) The program director must be certified in anatomic pathology, clinical pathology, or anatomic pathology and clinical pathology by the American Board of Pathology, or possess qualifications judged to be acceptable by the RRC.
   c) The program director must be appointed in good standing and based at the primary teaching site.
4. Responsibilities of the program director are as follows:
   a) The program director must oversee and organize the activities of the educational program in all institutions that participate in the program. This includes selecting and supervising the faculty and other program personnel at each participating institution, appointing a local site director, and monitoring appropriate resident supervision at all participating institutions.
   b) The program director is responsible for preparing an accurate statistical and narrative description of the program as requested by the RRC, as well as updating annually both program and resident records through the ACGME's Accreditation Data System.
   c) The program director must ensure the implementation of fair policies, grievance procedures, and due process, as established by the sponsoring institution and in compliance with the Institutional Requirements.
   d) The program director must seek the prior approval of the RRC for any changes in the program that may significantly alter the educational experience of the residents. Such changes, for example, include:
      (1) the addition or deletion of a participating institution;
      (2) a change in the format of the educational program;
      (3) a change in the approved resident complement for those specialties that approve resident complement. On review of a proposal for any such major change in a program, the RRC may determine that a site visit is necessary.

B. Faculty

1. At each participating institution, there must be a sufficient number of faculty with documented qualifications to instruct and supervise adequately all residents in the program.
2. The faculty, furthermore, must devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities. They must demonstrate a strong interest in the education of residents, and must support the goals and objectives of the educational program of which they are a member.

3. Qualifications of the physician faculty are as follows:
   a) The physician faculty must possess the requisite specialty expertise and competence in clinical care and teaching abilities, as well as documented educational and administrative abilities and experience in their field.
   b) The physician faculty must be certified in the specialty by the American Board of Pathology, or possess qualifications judged to be acceptable by the RRC.
   c) The physician faculty must be appointed in good standing to the staff of an institution participating in the program.
4. The responsibility for establishing and maintaining an environment of inquiry and scholarship rests with the faculty, and an active research component must be included in each program. *Scholarship* is defined as the following:
   a) the scholarship of *discovery*, as evidenced by peerreviewed funding or by publication of original research in a peer-reviewed journal;
   b) the scholarship of *dissemination*, as evidenced by review articles or chapters in textbooks;
   c) the scholarship of *application*, as evidenced by the publication or presentation of, for example, case reports or clinical series at local, regional, or national professional and scientific society meetings. Complementary to the above scholarship is the regular participation of the teaching staff in clinical discussions, rounds, journal clubs, and research conferences in a manner that promotes a spirit of inquiry and scholarship (e.g., the offering of guidance and technical support for residents involved in research such as research design and statistical analysis); and the provision of support for residents' participation, as appropriate, in scholarly activities.
5. Qualifications of the nonphysician faculty are as follows:
   a) Nonphysician faculty must be appropriately qualified in their field.
   b) Nonphysician faculty must possess appropriate institutional appointments.

C. Other Program Personnel

Additional necessary professional, technical, and clerical personnel must be provided to support the program.

1. The laboratories providing patient-care services must be accredited by the appropriate organizations and must be directed by a qualified physician who is licensed to practice medicine and is a member of the medical staff.
2. The number and qualifications of medical technologists and other support personnel must be adequate for the volume of work in the laboratory and the educational activities of the institution.

D. Resources

The program must ensure that adequate resources (e.g., sufficient laboratory space and equipment, classrooms, meeting rooms, computer and statistical consultation services) are available.

1. Office and laboratory space must be provided for the residents for both patient-care work and participation in scholarly activities.
2. The patient material of the department must be indexed in such a way as to permit appropriate retrieval.

3. Residents must have ready access to a major medical library, either at the institution where the residents are located or through arrangement with convenient nearby institutions. The services provided by the library should include the electronic retrieval of information from medical databases.

4. There must be access to an on-site library or to a collection of appropriate texts and journals in each institution participating in a residency program. On-site libraries and/or collections of texts and journals must be readily available during nights and weekends.
5. The audiovisual resources available for educational purposes should be adequate to meet the goals and objectives of the program.

IV. Resident Appointments

A. Eligibility Criteria

The program director must comply with the criteria for resident eligibility as specified in the Institutional Requirements.

B. Number of Residents

The RRC will approve the number of residents based upon established written criteria that include the adequacy of resources for resident education (e.g., the quality and volume of patients and related clinical material available for education), faculty-resident ratio, institutional funding, and the quality of faculty teaching. Programs must maintain a number of residents sufficient to promote an intellectually-stimulating educational environment. There should be at least two residents enrolled in each year of a program. A lesser number is cause for concern by the RRC.

C. Resident Transfers

To determine the appropriate level of education for residents who are transferring from another residency program, the program director must receive written verification of previous educational experiences and a statement regarding the performance evaluation of the transferring resident prior to their acceptance into the program. A program director is required to provide verification of residency education for residents who may leave the program prior to completion of their education.

D. Appointment of Fellows and Other Students

The appointment of fellows and other specialty residents or students must not dilute or detract from the educational opportunities available to regularly appointed residents.

V. Program Curriculum

A. Program Design

1. Format

   The program design and sequencing of educational experiences will be approved by the RRC as part of the review process.
2. Goals and Objectives

   The program must possess a written statement that outlines its educational goals with respect to the knowledge, skills, and other attributes of residents for each major assignment and for each level of the program. This statement must be distributed to residents and faculty, and must be reviewed with residents prior to their assignments.

B. Specialty Curriculum

The program must possess a well-organized and effective curriculum, both didactic and clinical. The curriculum must also provide residents with direct experience in progressive responsibility for patient management.

1. Didactic Components

a) 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.

b) 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.

c) 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 (including quality assurance, safety, regulations, and the use of hospital and laboratory information systems).

d) The educational experiences detailed above may be provided through separate, exclusive rotations, by rotations that combine more than one area, or by other means; in any case, all rotations and other assignments must conform to the educational goals and objectives of the program.

e) Seminars, Conferences, and Rounds

(1) There must be regularly-scheduled seminars and conferences devoted to the basic and applied medical sciences and clinical correlation conferences.

(2) Clinical correlation conferences (e.g., a pediatric mortality conference) should be held with clinical services such as internal medicine, surgery, gynecology, radiology, pediatrics, and their subspecialties.

(3) There must be departmental conferences, in which both faculty and residents participate, for detailed discussion of difficult and unusual cases.

(4) Residents must participate in the regular formal clinical and teaching rounds corresponding to the laboratory services to which they are assigned. For example, infectious disease service rounds should be attended during an assignment in microbiology.

f) Consultation

(1) Both faculty and residents must be regularly involved in consultative activity.

(2) Patient-care consultations should be both intra- and interdepartmental.

g) Resident Teaching

(1) Residents should participate in the education of medical students and other trainees.

(2) The effectiveness of residents as teachers should be monitored and evaluated by the program director and teaching staff.

2. Clinical Components

a) 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, and should develop the necessary professional and technical skills to perform the functions of an anatomic pathologist. This experience must emphasize the role of the pathologist as a consultant for effective patient care decisions.

b) While the quality of an educational program is not based upon volume of teaching material alone, programs should have sufficient volume and variety of material available for educational purposes to ensure that all residents:

(1) perform at least 50 autopsies during the program. Each resident must be the primary prosector of 40 autopsies. Further, programs must ensure that residents participate fully in all aspects (including gross and microscopic examinations) of the autopsies they count toward this standard. It is highly desirable that this experience include forensic and stillborn autopsies.

(2) examine and sign out at least 2,000 surgical pathology specimens during the program. This material must be from an adequate mix of cases to ensure exposure to both common and uncommon conditions.

(3) examine at least 1,500 cytologic specimens during the program. This material must include a variety of both exfoliative and aspiration specimens.

(4) perform at least 200 operating room consultations (frozen sections) during the program.

c) 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, and develop the necessary professional and technical skills to perform the functions of a clinical pathologist. This experience must emphasize the role of the pathologist as a consultant for effective patient care decisions.

d) The number and variety of tests performed in the laboratories utilized in the program should be sufficient to give residents experience in the range of tests typically available in a general
hospital. Further, resident experience should be augmented through the use of seminar and course materials and laboratory indexes of unusual cases.

e) While the quality of an educational program is not based upon the volume of teaching material alone, programs should have a laboratory workload that will ensure that all residents gain experience with the full spectrum of clinical pathology procedures.

f) Residents must be considered integral members of the staff of the Department of Pathology, and must have the opportunity to participate in discussion of matters related to management of the Department.

g) There must be periods of time when decision making in the laboratory is the direct responsibility of residents, under appropriate supervision.

C. Residents Scholarly Activities

Each program must provide an opportunity for residents to participate in research or other scholarly activities, and residents must participate actively in such scholarly activities.

1. Throughout their time in the program, residents should be exposed to and encouraged to participate in clinical or laboratory research, research seminars, work-in-progress sessions, and organized reviews of intradepartmental research.

2. Resident involvement in research may be related to methods development, clinical or basic research, or literature surveys, but in all cases the program should provide an environment that promotes research or scholarly activity by residents.

D. ACGME Competencies

The residency program must require that its residents obtain competence in the six areas listed below to the level expected of a new practitioner. Programs must define the specific knowledge, skills, behaviors, and attitudes required and provide educational experiences as needed in order for their residents to demonstrate the following:

1. *Patient care* that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents must demonstrate a satisfactory level of diagnostic competence and the ability to provide appropriate and effective consultation in the context of pathology services.

2. *Medical knowledge* about established and evolving biomedical, clinical, and cognate (eg, epidemiological and social behavioral) sciences and the application of this knowledge to pathology.

3. *Practice-based learning and improvement* that involves investigation and evaluation of their diagnostic and consultative practices, appraisal and assimilation of scientific evidence, and improvements in their patient care practices.

4. *Interpersonal and communication skills* that result in effective information exchange and collaboration with patients, their families, and other health professionals.

5. *Professionalism*, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

6. *Systems-based practice,* as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide pathology services that are of optimal value.

Resident Duty Hours and Work Environment

Providing residents with a sound didactic and clinical education must be carefully planned and balanced with concerns for patient safety and resident well-being. Each program must ensure that the learning objectives of the program are not compromised by excessive reliance on residents to fulfill service obligations. Didactic and clinical education must have priority in the allotment of residents' time and energy. Duty hour assignments must recognize that faculty and residents collectively have responsibility for the safety and welfare of patients.

A. Supervision of Residents

1. All patient care must be supervised by qualified faculty. The program director must ensure, direct, and document adequate supervision of residents at all times. Residents must be provided with rapid, reliable systems for communicating with supervising faculty.

2. Faculty schedules must be structured to provide residents with continuous supervision and consultation.

3. Faculty and residents must be educated to recognize the signs of fatigue, and adopt and apply policies to prevent and counteract its potential negative effects.

B. Duty Hours

2. Duty hours are defined as all clinical and academic activities related to the residency program; i.e., patient care (both inpatient and outpatient), administrative duties relative to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled activities such as conferences. Duty hours do *not* include reading and preparation time spent away from the duty site.

2. Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities.

3. Residents must be provided with 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call. *One day* is defined as 1 continuous 24-hour period free from all clinical, educational, and administrative duties.

4. Adequate time for rest and personal activities must be provided. This should consist of a 10-hour time period provided between all daily duty periods and after in-house call.

C. On-call Activities

The objective of on-call activities is to provide residents with continuity of patient care experiences throughout a 24-hour period. *In-house call* is defined as those duty hours beyond the normal work day, when residents are required to be immediately available in the assigned institution.

3. In-house call must occur no more frequently than every third night, averaged over a 4-week period.

2. Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Residents may remain on duty for up to 6 additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medical and surgical care.

3. No new patients may be accepted after 24 hours of continuous duty.

4. *At-home call* (or *pager call*) is defined as a call taken from outside the assigned institution.

   a) The frequency of at-home call is not subject to the every-third- night limitation. At-home call, however, must not be so frequent as to preclude rest and reasonable personal time for each resident. Residents taking at-home call must be provided with 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a 4-week period.

   b) When residents are called into the hospital from home, the hours residents spend in-house are counted toward the 80-hour limit.

   c) The program director and the faculty must monitor the demands of at-home call in their programs, and make scheduling adjustments as necessary to mitigate excessive service demands and/or fatigue.

D. Moonlighting

1. Because residency education is a full-time endeavor, the program director must ensure that moonlighting does not interfere with the ability of the resident to achieve the goals and objectives of the educational program.

2. The program director must comply with the sponsoring institution's written policies and procedures regarding moonlighting, in compliance with the ACGME Institutional Requirements.

3. Any hours a resident works for compensation at the sponsoring institution or any of the sponsor's primary clinical sites must be considered part of the 80-hour weekly limit on duty hours. This refers to the practice of internal moonlighting.

E. Oversight

1. Each program must have written policies and procedures consistent with the Institutional and Program Requirements for resident duty hours and the working environment. These policies must be distributed to the residents and the faculty. Duty hours must be monitored with a frequency sufficient to ensure an appropriate balance between education and service.

2. Back-up support systems must be provided when patient care responsibilities are unusually difficult or prolonged, or if unexpected circumstances create resident fatigue sufficient to jeopardize patient care.

F. Duty Hours Exceptions

An RRC may grant exceptions for up to 10% of the 80-hour limit to individual programs based on a sound educational rationale. Prior permission of the institution's GMEC, however, is required.

VI. Evaluation

A. Resident

1. Formative Evaluation

   The faculty must evaluate in a timely manner the residents whom they supervise. In addition, the residency program must demonstrate that it has an effective mechanism for assessing resident performance throughout the program, and for utilizing the results to improve resident performance.

   a) Assessment should include the use of methods that produce an accurate assessment of residents' competence in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.

   b) Assessment should include the regular and timely performance feedback to residents that includes at least semiannual written evaluations. Such evaluations are to be communicated to each resident in a timely manner, and maintained in a record that is accessible to each resident.

   c) Assessment should include the use of assessment results, including evaluation by faculty, patients, peers, self, and other professional staff, to achieve progressive improvements in residents' competence and performance.

2. Final Evaluation

   The program director must provide a final evaluation for each resident who completes the program. This evaluation must include a review of the resident's performance during the final period of education, and should verify that the resident has demonstrated sufficient professional ability to practice competently and independently. The final evaluation must be part of the resident's permanent record maintained by the institution.

B. Faculty

The performance of the faculty must be evaluated by the program no less frequently than at the midpoint of the accreditation cycle, and again prior to the next site visit. The evaluations should include a review of their teaching abilities, commitment to the educational program, clinical knowledge, and scholarly activities. This evaluation must include annual written confidential evaluations by residents.

C. Program

The educational effectiveness of a program must be evaluated at least annually in a systematic manner.

1. Representative program personnel (i.e., at least the program director, representative faculty, and one resident) must be organized to review program goals and objectives, and the effectiveness with which they are achieved. This group must conduct a formal documented meeting at least annually for this purpose. In the evaluation process, the group must take into consideration written comments from the faculty, the most recent report of the GMEC of the sponsoring institution, and the residents' confidential written evaluations. If deficiencies are found, the group should prepare an explicit plan of action, which should be approved by the faculty and documented in the minutes of the meeting.

2. The program should use resident performance and outcome assessment in its evaluation of the educational effectiveness of the residency program. Performance of program graduates on the certification examination should be used as one measure of evaluating program effectiveness.

3. The program should maintain a process for using assessment results together with other program evaluation results to improve the residency program.

VII. Experimentation and Innovation

Since responsible innovation and experimentation are essential to improving professional education, experimental projects along sound educational principles are encouraged. Requests for experimentation or innovative projects that may deviate from the program requirements must be approved in advance by the RRC, and must include the educational rationale and method of evaluation. The sponsoring institution and program are jointly responsible for the quality of education offered to residents for the duration of such a project.

VIII. Certification

Residents who plan to seek certification by the American Board of Pathology should communicate with the office of the board regarding the full requirements for certification.

ACGME: February 2001 Effective: July 2002 Editorial Revision: June 2004

ABP PATHOLOGY TRAINING REQUIREMENTS

PATHOLOGY TRAINING REQUIREMENTS

The training in pathology required for eligibility for certification by the American Board of Pathology (ABP) is listed below. The resident is advised to consult the brochure of information published each year by the ABP. This booklet gives the prerequisites and requirements necessary to qualify for the various examinations offered by the Board.

Combined Anatomic and Clinical Pathology (AP/CP) Certification: Four years of full-time, approved training in an accredited AP/CP-4 program, which includes:

- A minimum of 18 months of formal training in anatomic pathology.
- A minimum of 18 months of formal training in clinical pathology.
- An additional 12 months of full-time formal training in anatomic pathology and/or clinical pathology.
  OR
- 12 months of training in other areas of pathology as part of the defined four-year accredited AP/CP training program.

Anatomic Pathology (AP) Certification: There are two approaches to becoming certified in anatomic pathology:

- Three years of full-time, approved training in anatomic pathology in an accredited AP/CP-4 or AP-3 program which includes:
  - A minimum of 24 months of formal training in anatomic pathology.
  - An additional 12 months of training in anatomic pathology.
    OR
    12 months of training in other areas of pathology as part of the defined three-year accredited AP training program.
- Primary certification in clinical pathology and two full years of full-time, approved training in anatomic pathology in an accredited AP/CP-4 or AP-3 program which includes:
  - A minimum of 18 months formal training in anatomic pathology.
    _ Six months may be full-time, approved training in a subspecialty area of pathology as part of the defined accredited training program.

Clinical Pathology (CP) Certification: As with Anatomic Pathology, there are two approaches to becoming certified in clinical pathology:

- Three years of full-time, approved training in clinical pathology in an accredited AP/CP-4 program which includes:
  - A minimum of 24 months of formal training in clinical pathology.
  - An additional 12 months of training in clinical pathology.
    OR
  - 12 months of training areas of pathology as part of the defined four-year accredited AP/CP training program.
- Primary certification in anatomic pathology and two full years of approved training in clinical pathology in an accredited AP/CP-4 program which includes:
  - A minimum of 18 months of formal training in clinical pathology.
    - Six months may be full-time, approved training in a subspecialty area of pathology as part of the defined accredited training program.

Advanced Pathology Training Credit Mechanisms:

Advanced credit will not be granted to applicants who began pathology training on or after July 1, 2003. For applicants who began pathology residency training before this date, advanced credit may be given, under special circumstances, by the mechanisms described hereafter.

Advanced credit is any medically relevant, post-baccalaureate, 12-month experience that is not approved by the ACGME for training in pathology and is relevant to the education of pathologists as determined by the ABP. Such training may be applied to satisfy the flexible year in pathology. The acceptance of advanced credits as substitutes for accredited pathology training toward primary certification is not automatic and is evaluated on an individual basis. **Advanced credit is given only for activities that have occurred in either the United States or Canada.** The total combined period of advanced pathology training credit allowed for in paragraphs a and b in this section (III A 2) may not exceed 12 months and can be applied only to the "flexible year" of required pathology training necessary for certification in AP/CP, AP, or CP.

Advanced credit cannot be applied to combined primary and subspecialty certification requirements. (See Section III C, Combined Primary and Subspecialty Certification.) To avoid any misunderstanding, potential applicants should complete at least one full year of training before communicating with the ABP to ascertain whether credit may be acceptable. In order to determine the amount of advanced credit for which the applicant may be eligible, the applicant should submit to the ABP a written request for the Advanced Credit/Credentialing Requirement Evaluation form. The form must be completed and returned with the appropriate supporting documentation, including a letter of support from the pathology training program director. This letter should include a recommendation as to the amount of credit that the director believes the individual should receive. This recommendation should be made only after the pathology training program director has observed the performance of the applicant. After review of the application, the ABP will notify the applicant and the director of the pathology training program whether or not a recommendation for credit will be made to the Credentials Committee. Before the applicant is determined qualified for examination, the director of the final year of training must certify that the individual is fully qualified to sit for the examination.

If the applicant will be applying for primary certification within 12 months, the Advanced Credit/Credentialing Requirement Evaluation form should not be submitted, as the information requested on this form is also requested on the application for primary certification.

a. For residents entering pathology training programs on or after July 1, 2003, credit for a PhD degree will not be granted.

For residents who entered pathology training programs before this date, the following remains in effect: Applicants holding a PhD degree in a special discipline of pathology or a basic science related to pathology may, under certain circumstances, obtain pathology training credit. The evaluation and granting of the amount of training credit will depend on an assessment by the ABP regarding relevance of the field of study to anatomic pathology or clinical pathology.

b. For residents entering pathology training programs on or after July 1, 2003, the ABP will grant up to 6 months of research credit for primary certification. The research must be done during the pathology training program and with the approval of the pathology training program director.

For residents who entered pathology training programs before July 1, 2003, the following remains in effect: Research with a direct application to the practice of anatomic pathology or clinical pathology and not leading to an advanced degree may be considered for credit **not to exceed** 12 months in combination with other advanced credits. The research must be full-time, and the applicant must be able to demonstrate active participation in the generation of the hypothesis and development of the protocol. No credit is given for research employment as a technician or technologist.

Post-Pathology-Course Fellowships:
For students entering post-pathology-course fellowships on or after July 1, 2003, credit for successful completion of such programs will not be granted.

Prior to July 1, 2003, the following remains in effect: Under certain circumstances, applicants may receive advanced pathology training credit toward the primary certification requirements for post-pathology-course fellowship training or research in pathology. **Such credit is NOT given toward the requirements for subspecialty certification or combined primary/subspecialty certification.** Credit is assessed on an individual basis and may be applied only to the "flexible year" of required primary training. Credit may not be applied to the required 18 months of structured anatomic pathology training or the required 18 months of structured clinical pathology training necessary to qualify for combined anatomic and clinical pathology certification.

Advanced credit toward single certification in anatomic pathology or single certification in clinical pathology will be applied to the "flexible year" of required pathology training only and not to the 24 months of required structured training.

A separate application for advanced credit for post-sophomore fellowship training is not necessary, provided the following guidelines are met:

a. The fellowship program must be approved by the ABP.

b. The fellow fully and satisfactorily completed the medical school year in which the pathology course was taught prior to enrolling in the program.

c. The fellow did not receive credit (elective or required) toward the requirements for graduation from medical school for the pathology fellowship activities.

d. Training was full-time in a department of pathology with a fully accredited pathology training program.

e. Training has been validated by the director of the student fellowship program and is approved as an acceptable experience by the director of the accredited pathology training program in which the applicant is registered.

f. Training was under the direction of the director of the pathology training program or the chair of the department of pathology.

g. A description of proposed activities, responsibilities, and assignments for anatomic pathology, clinical pathology, and research was available and on file with the ABP prior to the beginning of the fellowship. If a formal institutional program exists, a copy should be filed with the ABP.

h. A validation and evaluation report was submitted to the ABP on completion of the fellowship by the pathology training program director or chair of the department of pathology.

The ABP web site is http://www.abpath.org. Address all communications to:

The American Board of Pathology
P.O. Box 25915
Tampa, FL 33622-5915
Phone: (813) 286-2444 Fax: (813) 289-5279

PROMOTION, PROBATION AND DISMISSAL:

Policies and procedures regarding academic promotion, probation, and dismissal are printed in the *Housestaff Handbook* published by the Office of Graduate Medical Education (Room 1816 UH) as well as in the front of the Residency Manual.