

Department of Pathology

AP/CP Residency

Resident's Manual

2013

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2013 LSU PATHOLOGY RESIDENCY HOUSE OFFICERS MANUAL

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****Milestones indicated in Red Font**

INTRODUCTION

The Department of Pathology at Louisiana State University School of Medicine in New Orleans directs an integrated Pathology Residency Training Program involving the Medical School, Department of Pathology and its teaching hospitals: Interim LSU Hospital (ILH), Ochsner Clinic Foundation Hospital (OCF), Children's Hospital in New Orleans (CHNOLA), and West Jefferson Medical Center (WJMC), as well as the Veterans Affairs Hospital (VA) and the Jefferson Parish Coroner's Office (JPCO).

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PROGRAM GOALS AND OBJECTIVES

The role of a pathologist is to contribute to patient care by acting as a diagnostic medical consultant providing diagnoses by interpretation of specimen material in the anatomic and/or clinical laboratory. In addition, pathologists contribute to the knowledge data base regarding disease by analysis of data from patient care or through experimentation and observation. Finally, the pathologist is an educator, teaching students, residents, allied health professionals and other physicians. The residency training program provides instruction and experiences that enable trainees to acquire skills necessary to become competent in each of these roles in all areas of anatomic and clinical pathology.

To accomplish these goals the program provides training in skills, cultivates critical thinking, develops managerial expertise, and increases communication abilities so that the trainee may successfully perform as a competent practicing pathologist. In addition the program promotes acquisition of skills and insights needed to evaluate, adapt, and incorporate new techniques and methodologies as they become available.

Responsibility for attaining these objectives falls on both the resident and faculty. The resident must perform assigned duties, read texts and current literature regarding encountered disease processes, acquire experience in technical and managerial aspects of the laboratory, expand communication skills, and grow into the role of educator. The faculty must aid residents in attaining these objectives, critically and honestly evaluate them, allow them to assume graded responsibility as they grow in knowledge and expertise, take part in didactic education, and provide an educational milieu that includes mutual professionalism and respect.

CURRICULUM (effective 7/1/11)

The American Board of Pathology requires that the AP/CP resident complete at least eighteen (18) months of structured training in anatomic pathology and eighteen (18) months of structured training in clinical pathology plus 12 flexible training months.

The LSU AP/CP Pathology Residency curriculum consists of a minimum of twenty-three (23) months of anatomic pathology training and eighteen (18) months of clinical pathology training. The additional six (6) months of training may be divided or concentrated in areas as indicated by either the residents' interests or by the program director's individualized learning plan for the resident. For *the minimum* months of the core rotations, see the block diagram below:

The PGY-I level resident is designated as the **junior resident**; the PGY-II resident is designated as **intermediate-level** and the PGY III and IV level residents are designated as in their 'final years of education' and are therefore **senior residents**.

ANATOMIC PATHOLOGY CURRICULUM

PGY I	Autopsy Pathology/ Neuropath: 2 months	Surg Path: 4 months:		
PGY II "intermediate- level" residents	Autopsy Pathology/ Neuropath: 1 months: MCL	Surg Path: 4 months	Cytology: 1 month MCL	Pediatric Pathology: 1 month
PGY III	Autopsy Pathology/ Neuropath: 1 months: MCL	Surg Path: 4 months	Cytology: 1 month MCL	
PGY IV	Forensic Path / Toxicology: 1 month: JPCO	Surg Path: 2 months	Cytology: 1 month MCL	

MINIMUM TOTAL AP MONTHS: 23

CLINICAL PATHOLOGY CURRICULUM

PGY I	Hematology 1 month		BB: 1 month	Microbiology 1 month			
PGY II "intermediate - level" residents	Chem/ Immuno- path 1 month	Heme/ Flow: 1 month	BB / Coagulation 1 month	Microbiology 1 month	Research: 1 months		
PGY III	Chem/ Immuno- path 1 month	Heme/ Flow: 1 month	BB: 1 month	Microbiology 1 month			
PGY IV	Chem/ Immuno- path 1 month	Heme/ Microscopy: 1 month	BB: 0.5 month	Microbiology 1 month	Lab Management 1 month	Molecular / Cytogenetics 1 month	Toxicology 0.5month

MINIMUM TOTAL CP MONTHS: 18

*Additional rotational experience will be gained in **Electron Microscopy** and in **Informatics** either in combination with other rotations or across rotational experiences.

CORE COMPETENCIES

The LSU Pathology residency abides by the ACGME 6 CORE COMPETENCIES across all areas of pathology. These embody specific knowledge, skills, behaviors and attitudes that are required of residents to complete Graduate Medical Education (GME) programs. They are universal across all medical disciplines. Each resident is evaluated and guided on his/her progress in each of the individual competencies listed below.

Patient Care: residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health

Medical Knowledge: residents must be able to demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences as well as the application of this knowledge to patient care

Practice-Based Learning and Improvement: residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence and to continuously improve patient care based on constant self-evaluation and lifelong learning

Interpersonal and Communication Skills: residents must be able to demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families and health professionals.

Professionalism: residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Systems-Based Practice: residents must demonstrate an awareness of the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

All evaluation instruments are categorized by competency and the newly described Pathology Milestones are also competency based. Below are some applications of the 6 core competencies to the field of Pathology.

PATIENT CARE in the field of Pathology

- Developing a diagnostic plan based on specific clinical questions and relevant clinical and pathologic information.
- Functioning as part of a multidisciplinary healthcare team in developing a therapeutic plan
- Serving as a consultant in a multidisciplinary conference
- Gathering essential and accurate information about patients using all relevant available modalities.
- Acting as a skilled consultant to other clinicians

MEDICAL KNOWLEDGE in the field of Pathology

- Using and evaluating evidence-based information in evaluating and presenting findings
- Critically reviewing peer-reviewed journals for use in patient care
- Maintaining a knowledge base in the basic and clinical sciences that provides for the necessary consultative role of a pathologist
- Acquiring sufficient knowledge to determine clinically optimal yet cost-effective diagnostic and therapeutic strategies
- Defining testing turnaround time and in-house vs referral diagnostic testing strategies

- Understanding statistical laboratory methods and application to quality control (QC) and quality assurance
- Demonstrating awareness and understanding of general and test-specific standards for method development and evaluation, such as those promulgated by the Clinical Laboratory Standards Institute, CAP, and similar organizations.
- Demonstrating awareness and understanding of proficiency programs, such as those provided by CAP and similar organizations.
- Demonstrating knowledge of the principles of clinical research design, implementation, and interpretation. Understand the various levels of evidence in medicine and their translation into evidence-based practice.
- Designation of study design and research methodologies and parameters of clinical utility for the implementation and continuing use of new evidence based analytes

PRACTICE BASED LEARNING AND IMPROVEMENT in the field of Pathology

- Maintaining a self-awareness of one's progress and track across the Milestones
- Expressing a commitment to lifelong learning through seeking knowledge of evidence-based medicine
- Critically appraising the scientific literature
- Effectively incorporating information technology, to optimize and support patient care decisions.
- Developing personal strategies for the identification and remediation of gaps in medical knowledge
- Using laboratory problems and clinical inquiries to identify process improvements to increase patient safety.
- Maintaining awareness of continual competency assessment for both pathologists as well as laboratory personnel
- Using proficiency programs to improve laboratory practices.

INTERPERSONAL AND COMMUNICATION SKILLS in the field of Pathology

- Demonstrating the ability to write an articulate, legible, and comprehensive yet concise consultative note.
- Providing clear and informative pathology reports including a precise diagnosis whenever possible, a differential diagnosis when appropriate, and recommended follow-up or additional studies as appropriate.
- Demonstrating a direct communication line for the referring physician or appropriate clinical personnel when interpretation of a laboratory assay reveals an urgent, critical, or unexpected finding and document this communication in an appropriate fashion.
- Conducting him/herself at presentations and multidisciplinary conferences in a focused, clear, and concise manner
- Demonstrating an ability to communicate the service role of the pathologist to other clinicians as well as to other healthcare personnel and administrators
- Navigating multiple communication modes effectively including: listening, nonverbal, explanatory, questioning, face-to-face, telephone, e-mail, and written as appropriate.
- Demonstrating the necessary skills in obtaining informed consent, including effective communication to patients about procedures, alternative approaches, and possible complications
- Interacting will with medical technologists in the day-to-day laboratory environment
- Demonstrating the ability to educate nonpathology clinicians and other healthcare workers, including pharmacists, nurses, residents, medical students, and others

PROFESSIONALISM in the field of Pathology

- Demonstrating compassion in the care of patients, their families, and the faculty and physicians caring for them.
- Interacting with all in the workplace without discriminating on the basis of religious, ethnic, sexual, or educational differences.
- Demonstrating consistently positive work habits, including punctuality; dependability, and a professional appearance.
- Demonstrating a responsiveness to the needs of patients and society that supersedes one's own self-interest.
- Maintaining the highest standards of patient confidentiality with all information transmitted both during and outside of a patient encounter.
- Staying current in one's knowledge of regulatory issues pertaining to the use of human subjects in research.
- Staying committed to excellence and ongoing professional development.
- Striving for high standards in interpersonal skills as a professional member of a multidisciplinary healthcare team.

SYSTEMS BASED PRACTICE in the field of Pathology

- Demonstrating an understanding of the role of the pathologist in the healthcare system.
- Recognizing resource utilization and management in diagnostic plans as part of the best practices approach to patient care in collaboration with other clinicians.
- Maintaining a working knowledge of basic healthcare reimbursement methods.
- Demonstrate knowledge of the laboratory regulatory environment, including licensing authorities; federal, state, and local public health rules and regulations; regulatory agencies such as the Centers for Medicare and Medicaid Services and the US Food and Drug Administration; and accrediting agencies such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), CAP
- Striving for an understanding of accreditation agencies of Graduate Medical education (ACGME)
- Seeking to continually improve patient safety as they relate to clinical laboratory testing at all levels.

MILESTONES

As residency education becomes outcomes-based, each specialty has developed or is in the process of developing specialty-specific Milestones for resident performance within the six domains of clinical competence. The Milestones are competency-based developmental expectations that can be demonstrated progressively by residents from the beginning of their education through graduation to the unsupervised practice of their specialty. Pathology milestones are currently in draft form and are scheduled to be implemented fully July 1, 2014. In preparation for the implementation of the Pathology Milestones, two main educational committees will be created. Milestones in their current draft form will be inserted below whenever rotation-specific. Otherwise, consult the Appendix for the general AP/CP, AP or CP Milestones pp. 90-97

CLINICAL COMPETENCY COMMITTEE (CCC) - effective July 1, 2013

The CCC functions as an early warning system to identify residents requiring remediation and to evaluate and make recommendations for all other trainees regarding promotion. The responsibility of the CCC is to review all resident evaluation measures and make recommendation to the program director (PD) for resident progress including promotion, remediation or dismissal. Results will be reported by the PD to the ACGME via the Milestones tracking system (ADS) twice a year at the times set by the ACGME. Members of the CCC

must be appointed by the PD, and consist of a minimum of 3 board certified pathologist members of the core residency faculty. The CCC should actively participate in reviewing all resident evaluations by all evaluators semiannually. The CCC serves in an advisory role to the PD in preparing and assuring the reporting of Milestone data on each resident. The CCC also serves to make recommendations regarding resident progress including promotion, remediation, and dismissal.

Full detail and implementation plans will be described by July 1, 2014.

PROGRAM EVALUATION COMMITTEE (PEC) - effective July 1, 2013

The PEC will assume the role of the former *Education and Evaluation Committee (EEC)*. The PEC will be composed of at least 3 members of the residency faculty and include representation from the residents. The committee will participate actively in planning, developing, implementing and evaluating all significant activities of the residency program; developing competency based curriculum goals and objectives, reviewing annually the program using evaluations of faculty, resident and others and assuring that areas of non-compliance with ACGME standards are corrected. Through the PEC, the program will document formal, systematic evaluation of the curriculum at least annually and is responsible for rendering a full, written annual program evaluation. Representatives from other training sites as well as the program director (PD), program coordinator (PC) and Department Chair will be included. Data and outcomes to be analyzed also include volume/variety of case material, sufficiency of resident supervision, and resident performance on the yearly ASCP RISE (resident in-service examination) and The American Board of Pathology examinations. Additional activities of the PEC may include oversight for the American Board of Pathology examination timeline, the education and evaluation of pathology fellows and rotating medical students. Members will actively participate in the selection and ranking of resident applicants in the match.

Full detail and implementation plans will be described by July 1, 2014.

PROFESSIONAL PATHOLOGY AND MEDICAL SOCIETIES

American Society of Clinical Pathologists (ASCP)

<http://www.ascp.org/Residents/Membership-for-Residents/US-Residents>

FREE to residents

Yearly Meeting: September 18-21, 2013- Beyond the Lab, Chicago, IL

Abstract deadline: June 3rd, 2013

College of American Pathology (CAP)

<http://www.cap.org/apps/cap.portal>

FREE to residents ("Junior Member")

Yearly Meeting: October 13–16, 2013, Orlando, FL- The Pathologists Meeting

Abstract deadline April 1, 2013

United States and Canadian Academy of Pathology (USCAP)

<http://www.uscap.org/home.htm>

\$35 for residents Why join? : <http://www.uscap.org/index.htm?future.htm>

Yearly Meeting: Mar 1-7, 2014, San Diego, CA

Abstracts deadline: early October 2013

Louisiana State Medical Society (LSMS/Parish)

You join State and Parish at the same time on LSMS form, designating parish
<http://www.lsms.org/site/join-the-lsms>

- Orleans Parish: <http://www.opms.org/> \$35
Biannual dinner meeting

- Jefferson Parish: <http://www.jpms.org/> \$35
Fishing rodeo, discounted Audubon membership, Office Depot, DocBookMD, etc.

-LSMS Journal website: <http://journal.lsms.org/>

EVALUATIONS and FEEDBACK OPPORTUNITIES

Giving Feedback:

Residents have the opportunity to provide both open-forum feedback and anonymous feedback. Open forum feedback is encouraged and facilitated by a monthly Chief Resident – PD morning meeting. Residents provide peer-to-peer feedback in an open environment when a senior supervises a junior level resident on surgical rotation and once yearly in an anonymous setting. Semiannual sessions also offer an opportunity for resident suggestions for programmatic improvement. Anonymous feedback is solicited monthly following the conclusion of rotations, monthly following the conclusion of a didactic topic, yearly in the faculty review, and yearly in the program review. External agencies also seek anonymous resident feedback once per year to include the ACGME and the LSU GME office.

Getting Feedback:

Residents are provided electronic and written feedback from multiple sources. Faculty complete rotational evaluations electronically. Additionally, there are specific skill evaluations offered at the conclusion of each surgical pathology month and once yearly for each of the other major pathology skills: autopsy, frozen section and fine needle aspiration. Non physician health care professionals are also asked for written feedback once yearly and include medical technologists and transcriptionists. Medical student evaluations are offered once yearly and peer-to peer evaluations are issued once yearly in an anonymous format. Junior residents are evaluated by their senior resident at the conclusion of their surgical pathology rotation. Engagement and participation in hospital quality improvement committees is also evaluated by committee leads once yearly and presentations such as Grand Rounds are evaluated by all those in attendance. Participation in morning conferences is also evaluated by the presenting faculty. A self-evaluation instrument modeled after the Pathology Milestones is issued semiannually prior to the formal summative semiannual review with the PD.

Semiannual Review:

At least semiannually, all evaluative data sources are aggregated and critiqued by the CCC. These evaluations form the basis on which promotion, remediation and dismissal recommendations are made. A resident may review their evaluations at any time

OPPORTUNITIES FOR TEACHING

Residents are expected to take part in the education of third and fourth year medical students in the Career Planning Elective and the Pathology Elective. In both electives, resident will be given the opportunity to contribute to the overall evaluation of the student and the student, in turn, anonymously evaluates the teaching effectiveness of each resident. The student evaluations are aggregated and reviewed with the resident at the time of the biannual review.

In addition, residents are expected to mentor, supervise, and teach medical and or nursing students who are observing the autopsy procedure at ILH.

Residents are also engaged in teaching other residents, not only their peers, but also those from other departments. Examples of this include the multidisciplinary tumor boards, Medicine Case Conferences, Emergency Medicine Forensic Conference, City-Wide and Infectious Disease conferences, etc. at various institutions where residents discuss the pathology of cases under review, as well as specialty conferences at Ochsner, WJMC, ILH and Children’s Hospitals.

Residents are also expected to take a leadership role in the Gross Pathology monthly conference, once yearly in the Grand Rounds seminars, and in various other conferences such as Journal Club and interesting case conferences such as Cytology Case conference and Autopsy Case conference.

For students seeking formal teaching responsibilities, opportunities may arise in either Dental pathology or in the sophomore medical school courses. Interest should be discussed with the PD and participation will be reserved for residents in good standing.

Teaching Milestone: see MK2 Milestone below. MK2 carries across all rotations at all sites.

MK2: Teaching: Demonstrates behavior that interprets, synthesizes, summarizes knowledge and teaches (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Participates in active learning	Understands and begins to acquire the skills needed for effective teaching; able to teach medical students	Able to teach peers	Able to teach across departments and at all levels across the institution, including patients and families	Models teaching across departments and at all levels across the institution, including patients and families

SCHOLARLY ACTIVITY AND RESEARCH OPPORTUNITIES

Residents are expected to participate in scholarly pursuits during their training program. Residents are expected to become involved with national pathology organizations and to become meaningfully involved with hospital based committees. Residents should approach their education with a scholarly eye towards multidisciplinary scientific pursuit of knowledge with a core mission to disseminate learned knowledge to peers, students and other health care professionals. In addition to traditional research, activities deemed scholarly will included multidisciplinary conferences, local, regional and national conferences, teaching, poster and oral presentations as well as publications.

Didactic conferences including CORE curriculum lecture series on study design and on patient safety and quality improvement will be required. An elective in Research is offered to all residents for the purposes of securing time to pursue scholarly pursuits.

Logging of scholarly activity should be completed and up to date prior to a resident’s scheduled semiannual review with the PD.

Skill Level I:

Completion of core curriculum modules; proficiency in presenting at multidisciplinary academic conferences; presentation at departmental chairman rounds; participation in bimonthly journal club

Skill Level II:

Publication of a pathology case with a faculty supervisor and/or involvement in basic science research project. Interdisciplinary collaboration is recommended and preferred. Additional options include presentation of research project to include pro and retrospective analyses.

Scholarly Activity Milestone: see PBLI2 below. PBLI2 carries across all rotations at all sites.

PBLI2: Scholarly Activity: Analyzes and appraises, identifies, interprets and manipulates, applies scientific method (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Utilizes and applies basic texts Able to use presentation software, online literature databases and searches	Utilizes and applies pathology specific books Develops knowledge of the basic principles of research (demographics, IRB, human subjects), including how research is conducted, evaluated, explained to patients and applied to patient care	Critically reads the medical literature and incorporates into presentations and lectures Applies knowledge of the basic principles of research Adds to portfolio of scholarly activities, which may include manuscript preparation, abstract presentation at a local, regional or national meeting, or other scientific presentation	Critically examines literature for study design and use in evidence based clinical care Identifies gaps in the currently available knowledge	Proficient in critical evaluation of the literature and participates in life-long learning

PROFESSIONALISM

On the topic of house officer professionalism, the LSU Pathology Residency adopts the same overriding principals as the institutional GME office. Of the 6 core competencies, a commitment to Professionalism actually leads to improvement in all of the other competencies and is critical to our continued existence as a profession and your successful development and performance as a physician. The elements of Professionalism are:

1. Altruism
2. Accountability
3. Excellence
4. Duty
5. Honor and Integrity
6. Respect for others

You will be evaluated in many ways for adherence to the above principles. In addition, behaviors that reflect a commitment to professionalism include competition of all tasks which are assigned to you including

1. Accurately logging and adhering to duty hour standards
2. Accurately logging and attending to medical records
3. Accurately logging and attending to case log recording
4. Attendance at conferences
5. Alertness management
6. Assurance of fitness for duty
7. Recognition of impairment
8. Adherence to policies governing transitions of care
9. Working core modules and other online assignments

10. Maintenance of licensure and certifications
11. Awareness of and compliance with institutional policies
12. Adherence to policies and procedures in GME including those in the House officer manual and other program and institutional requirements.

For the full statement, see the LSU House Officer Manual http://www.medschool.lsuhs.edu/medical_education/graduate/HouseOfficerManual/LSUMS%20House%20Officer%20Manual%202013-2014.pdf

Professionalism Milestones: see below. PROF1-7 carry across all rotations at all sites.

PROF1: Licensing, certification, examinations, credentialing: Demonstrates attitudes and practices that ensures timely completion of required examinations and licensure (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Completes and passes step 2CK and 2CS of USMLE	Completes and passes Step 3 of USMLE Performs at expected level on in-service and other objective examinations Begins assembling portfolio of experiences	Performs at expected level on in-service and other objective examinations Demonstrates expanded portfolio and reviews with program director at semi-annual evaluation	Applies for full and unrestricted medical license Performs at expected level on in-service and other objective examinations Demonstrates expanded portfolio and reviews with program director at semi-annual evaluation	Obtain full and unrestricted medical license Board certified and participates in maintenance of certification (SAMS, etc.) Maintains portfolio

PROF2: Professionalism: Honesty, integrity, and ethical behavior (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Behaves truthfully and understands the concepts of ethical behavior, occasionally requiring guidance; seeks counsel when ethical questions arise	Is truthful, acknowledges personal near misses and errors and puts the needs of patients first; engages in ethical behavior	Demonstrates truthfulness to all members of the health care team	Exemplifies truthfulness to all members of the health care team; is viewed as a role model in accepting personal responsibility by members of the health care team; and always puts the needs of each patient above his/her own interests	Models truthfulness to all members of the health care team; is viewed as a role model in accepting personal responsibility by members of the health care team; and always puts the needs of each patient above his/her own interests

PROF3: Professionalism: Humanistic Behaviors of Respect, Compassion, and Empathy (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Understands the concepts of respect, compassion, and empathy	Demonstrates respect, compassion and empathy	Demonstrates respect, compassion and empathy	Demonstrates respect, compassion and empathy	Models respect, compassion and empathy, in complex situations

PROF4: Professionalism: Responsibility and follow through on tasks (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Completes assigned tasks on time	Dependably completes assigned tasks in a timely manner; assists team members when requested; respects assigned schedules	Anticipates team needs and assists as needed	Anticipates team needs and takes leadership role to independently implement solutions	Exemplifies effective management of multiple competing tasks, including follow through on tasks. Is source of support/guidance to other members of health care team

PROF5: Professionalism: Giving and receiving feedback (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Receives feedback constructively	Accepts feedback constructively and modifies practice in response to feedback	Able to provide constructive feedback	Exemplifies giving and receiving constructive feedback; encourages and actively seeks feedback to improve performance	Models giving and receiving constructive feedback; encourages and actively seeks feedback to improve performance

PROF6: Professionalism: Responsiveness to each patient's unique characteristics and needs (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Respects diversity, vulnerable populations, and patient autonomy	Embraces diversity and respects vulnerable populations; aware of potential for bias or cultural differences to affect clinical care	Demonstrates cultural competency; identifies and avoids biases and recognizes cultural differences that may affect clinical care	Exemplifies cultural competency; identifies and avoids biases and recognizes cultural differences that may affect clinical care	Models cultural competency and works with peers to avoid biases and recognizes cultural differences that may affect clinical care

PROF7: Professionalism: personal responsibility to maintain emotional, physical, and mental health (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Aware of importance of emotional, physical, and mental health and issues related to fatigue/sleep deprivation; Exhibits basic professional responsibilities such as timely reporting for duty rested, ready to work, and appropriately dressed	Manages emotional, physical, and mental health and issues related to fatigue/sleep deprivation; Recognizes signs of impairment and seeks appropriate help when needed	Manages emotional, physical, and mental health and issues related to fatigue/sleep deprivation, especially in stressful conditions	Recognizes signs of impairment and facilitates seeking appropriate help when needed	Accesses institutional resources to address impairment and initiates seeking appropriate help when needed

RESIDENT PROMOTION

Promotion is based upon evaluation tools including rotation evaluations, in-training examinations, 360 degree evaluations and any other pertinent information. The CCC committee is the deciding body as to resident promotion.

For a resident to be promoted to PGY-2 all of the following criteria must be satisfied:

Pass	Fail	Criteria
		'Satisfactory' status for promotion as determined by CCC
		USLME – Must at least sit for step III
		Cumulative conference attendance $\geq 70\%$
		Successful presentation at at least two of the following: 1) Gross Conference 2) Journal Club 3) Grand Rounds 4) Any Autopsy related conference 5) Tumor Board

For a resident to be promoted to PGY-3 all of the following criteria must be satisfied:

Pass	Fail	Criteria
		'Satisfactory' status for promotion as determined by CCC
		USLME – Step III Pass
		Cumulative conference attendance $\geq 70\%$ Note: If RISE score as PGY-1 was less than national average overall, cumulative conference attendance must be $\geq 75\%$
		Successful presentation at at least three of the following: 1) Gross Conference 2) Journal Club 3) Grand Rounds 4) Any Autopsy related conference 5) Tumor Board, 6) Pediatric Pathology Grand Rounds

For a resident to be promoted to PGY-4 all of the following criteria must be satisfied:

Pass	Fail	Criteria
		'Satisfactory' status for promotion as determined by CCC
		Cumulative conference attendance $\geq 70\%$ Note: If RISE score as PGY-2 was less than national average overall, cumulative conference attendance must be $\geq 75\%$
		Successful presentation at at least three of the following: 1) Gross Conference 2) Journal Club 3) Grand Rounds 4) Any Autopsy related conference 5) Tumor Board, 6) Pediatric Pathology Grand Rounds

ROTATION REMEDIATION

Each evaluation is scored with an overall score graded 1-3 as follows:

Score 1: Resident needs to remediate all or part of the rotation

Score 2: Resident met the standards on the rotation

Score 3: Resident exceeded the standards required on the rotation

A score of a 1 is deemed an unsuccessful score. The faculty must detail the remediation plan and whether the whole or part of the rotation must be repeated. This must be noted on the next semiannual review with the PD and a plan must be made to address the deficiency. Note, elective time may be diminished in order to remediate the deficiency. If the deficiency is deemed by the CCC to be large and the program cannot accommodate a shift in schedule, the resident's length of training may be extended. This will be discussed and detailed with the CCC and the resident.

RESIDENT SUPERVISION (see graphical representation below)

The supervision of residents is a graded one and is classified according to three main levels:

1. Direct Supervision (DS) – the supervising physician is physically present with the resident and patient
2. Indirect Supervision (ID) –
 - ID with DS immediately available – the supervising physician is physically within the hospital or other site of patient care, and is immediately available for DS
 - ID with DS available – the supervising physician is not physically present within

Faculty is always reachable via telephonic and/or electronic modalities. Lists of contacts numbers and faculty call schedules are distributed to all residents monthly. As a backup, the call schedules are always made available to hospital operators and operating room nursing supervisors. Call schedules are posted online and are maintained daily on the V drives at ILH.

the hospital or other site of patient care, but is immediately available by means of telephonic and/or electronic modalities, and is available to provide DS

3. Oversight (O) – the supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered

PGY-1 residents will be supervised in one of two ways, only: (1) DS or (2) ID with DS immediately available. DS will apply during performance of, at least, the initial three procedures in the following areas:

1. Autopsies
2. Gross dissection of surgical pathology specimens by organ system
3. Frozen sections
4. Fine needle aspirations and interpretation

The manner for documentation of DS is as follows: 1) dictation of supervising physician into the autopsy protocol, 2) dictation of supervising physician into the gross dictation, 3) case-log and direct documentation of physician supervision for frozen sections and 4) case-log entry of physician supervision for fine needle aspirations. For examples of the instruments, see Appendix. The completed instruments will be maintained in each resident's portfolio.

A ≥PGY-3 resident may directly supervise the gross dissection and/or the autopsy and/or the apheresis procedure.

PGY-2 (intermediate) and ≥PGY-3 house officers will be supervised at levels commensurate with the residents' abilities and so assigned by either the program director or other supervisory faculty.

Diagrammatic Representation of Supervision:

	<i>Direct Supervision by Faculty</i>	<i>Direct Supervision by ≥PGY-3 resident</i>	<i>Indirect but immediately available</i>	<i>Indirect but available</i>	<i>Oversight</i>
Autopsy					
<i>PGY-I Skill Level I</i>	++	++			
<i>PGY-I Skill Level II</i>			++		
<i>≥ PGY-2</i>			++	++	
Frozen Section Preparation					
<i>PGY-I Skill Level I</i>	++	++			
<i>PGY-I Skill Level II</i>			++		
<i>≥ PGY-II</i>			++	++	++
Frozen Section Interpretation					
<i>PGY-I Skill Level I</i>	++				
<i>PGY-I Skill Level II</i>	++				
<i>≥ PGYII II</i>	++				
Bone Marrow Biopsy/ Aspirate					
<i>PGY-I</i>	++	++	++		
<i>≥ PGY-II</i>		++	++	++	
Fine Needle Aspiration					
<i>PGY-I</i>	++	++			
<i>≥ PGY-II</i>	++	++	++		
Fine Needle Cytologic Diagnosis					
<i>PGY-I</i>	++				
<i>≥ PGY-II</i>	++				
Apheresis					
<i>PGY-I</i>	++				
<i>≥ PGY-II</i>			++		
Grossing Pathology					
<i>PGY-I Skill Level I</i>	++	++	++		
<i>PGY-I Skill Level II</i>			++		
<i>≥ PGY-II</i>			++	++	++

REQUIRED FACULTY NOTIFICATIONS

All after hours (after 5pm) calls to residents which result in the resident returning to the hospital must be called in to the faculty on call for a check of supervision. During the work hours (7-5pm), any call made to a resident with a request for a procedure to include FNA, bone marrow, autopsy, frozen section must be called in to the attending covering the specific service in question.

TRANSITIONS IN CARE AKA HAND-OFFS

The program maintains a policy on providing structured patient / case transitions in care (TIC) for the purposes of providing safe and effective patient care in pathology. Structured TIC should occur in any circumstance when coverage of a service or case is passed from one resident to another. Some examples of circumstances in which documented TIC should occur include:

- Scheduled change over for rotations to include surgical pathology, neuropathology, autopsy when applicable
- On call patient care activities that require communications to the day team of residents and/or faculty providers to include frozen section cases and transfusion medicine cases

- Coverage of services during resident absences for any reason – either planned or unplanned

To offset abrupt TIC in surgical pathology, the senior most resident will start his/her service ½ day earlier than the remainder of the incoming team. He/she will receive the TIC signout from the outgoing upper level resident.

Review of the residents’ effectiveness in both receiving and providing safe TIC occur via the following ways:

- Monthly rotational evaluations
- Monthly didactic clinical call conferences
- TIC tracking sheets maintained in surgical pathology, autopsy and neuropathology

TIC must occur both face-to-face and via written documentation. Written TIC are to be logged in the TIC binder when appropriate (eg. surgical pathology, neuropathology). Should email communication be utilized, the lsuhsc.edu encrypted mail system is the only approved email exchange.

RESIDENT CONFERENCES AKA DIDACTICS

The resident didactic conferences are the morning sessions that run from 730-830am across the academic year. The curriculum is a 2 year curriculum with both an AP and a CP topic assigned each month. The conferences are an opportunity for the residents to passively learn from faculty from all training sites as well as from faculty from the larger pathology community.

Attendance Rate:

A running 70% attendance rate is expected from every resident and factors into each residents ‘good status’ standing as determined by the CCC. If a resident’s overall RISE performance in the prior spring is below the national average / his year of training, a 75% attendance is expected. This permits a 25-30% absence from conference which builds in all leave time that is allowable. A resident who is consistently below his/her conference attendance rate and is below the overall RISE performance standard for his/her year may not be permitted to utilize the entirety of his/her book fund.

<i>even</i>	AP	CP
JULY	CardioVascular	Heme
AUG	Gynecologic	Molecular
SEPT	Breast	Heme
OCT	Liver / Pancreas	BB/TM
NOV	GU (bladder/ renal)	Microbiology: parasitology and virology
DEC	Neuropath	Chemistry
JAN	Cytology	Molecular
FEB	GI	Microbiology: fungal
MAR	Bone / Soft Tissue	Chemistry
APR	DermPath/Forensics	BB/TM
MAY	Pulmonary	Lab Admin / Toxicology
JUNE		

odd	AP	CP
JULY	GI	Microbiology: gram positive bacteria
AUG	Neuropath	Chemistry
SEPT	Ovary / Placenta	Heme
OCT	Lymph Node / Spleen	BB/TM
NOV	Prostate/ Testes	Lab Administration / Chemistry
DEC	Bone / Soft Tissue	Heme
JAN	Pulmonary	Microbiology: gram negative bacteria
FEB	DermPath/ Forensics	Molecular
MAR	Cytology	EM/IF
APR	Head and Neck	BB/TM
MAY	Endocrine	Lab Admin / Toxicology
JUNE		

The 3 Ps of conference are expected from every resident from day one. :

Punctuality: be on time. Do not enter the conference consistently late. Your peers you're your faculty have made the effort. You should do so as well.

Prepared: if there were slides to preview, then preview them and at least characterize your thoughts about what you see. If there were articles to read, then read them. Show your colleagues that you respect the time and effort they have put in to the conference preparation by also preparing.

Power-down: put your cell down and do not text, email or Google during conference. It is fine to take written notes so that you can later look up items and learn but you should be actively listening and engaging rather than syncing with your device.. remember- you are not allowed to take your cell phones into the boards with you.

PATIENT SAFETY AND QUALITY IMPROVEMENT INITIATIVES

Residents are expected to integrate and actively participate in interdisciplinary clinical quality improvement and patient safety programs. Most residents will be appointed to one of the many hospital-based, quality improvement focused, committees at which their meeting attendance and participation will be evaluated annually. In addition, residents will collectively participate in a quality improvement exercise in their lab management rotation and individual quality-centric projects will be encouraged through the HSC- EQUIPS initiative to support and facilitate quality improvement projects.

RESIDENT ELIGIBILITY AND SELECTION

Resident eligibility and selection criteria are outlined on page 5 of the LSU School of Medicine House Officer Manual, the link to which is provided below:

http://www.medschool.lsuhs.edu/medical_education/graduate/HouseOfficerManual.aspx

In addition to those criteria, the PD reviews applications from individuals applying for the pathology residency program. Based upon this review which includes evaluation of medical school transcript, board scores, personal statement and recommendations, invitations for personal interviews are issued. During the interview process candidates meet with the PD, department head, a variety of faculty and as many residents as possible. At the conclusion of all the interviews, all of these individuals participate in discussions regarding rank order list. The PEC will serve an active role in the process of recruitment, selection and ranking of prospective residents.

MOONLIGHTING

The practice of medicine outside the education program (moonlighting) by house officers in the Pathology Department are evaluated on an individual basis by the department head upon the written request of the individual house officer. These activities at no time may interfere with the educational commitments and responsibilities of the house officer. In order to engage in such activities the resident shall request permission in writing from the department head, outlining the duties to include location, time, frequency, and nature of the duties. The department head may then approve or disapprove of the request. Any house officer who performs activities other than those approved by the department head may be placed on probation or dismissed, whichever is appropriate.

Absolutely no moonlighting is permitted for a PGY-I resident and all moonlighting hours must be counted towards the 80-hour maximum weekly hour limit.

The LSU School of Medicine House Officer Manual discusses moonlighting on pg. 21, the link to which is provided below:

http://www.medschool.lsuhschool.edu/medical_education/graduate/HouseOfficerManual.aspx

DISCIPLINARY ACTION, ADVERSE ACTIONS INCLUDING TERMINATION AND DUE PROCESS

The LSU School of Medicine House Officer Manual discusses all levels of substandard disciplinary action and the procedures thereof including the resident's due process and the role of the ombudsman on pages 8-12, the link to which is provided below:

http://www.medschool.lsuhschool.edu/medical_education/graduate/HouseOfficerManual.aspx

HOLIDAYS

Residents will follow the holiday schedule at the site at which they are rotating but any potential holiday coverage must be discussed in advance with the rotational supervising faculty.

RESIDENT DUTY HOURS AND CALL

Normal daily duty periods are detailed in each rotational section.

The program strictly abides by the ACGME Duty Hours revision document July 2011. For details, see the ACGME.org Common Program Requirements.

All call is pager call. There is no in-house call. All call is strictly for > PGY-II residents.

Call is comprehensive in scope and includes anatomic and clinical pathology needs.

Call is taken one week at a time (Monday – Sunday) but not for more two consecutive weeks.

Residents will be provided with 1 day in 7 totally free from all educational and clinical responsibilities (including home call) when averaged over a 4-week period.

Duty periods of PGY-2 residents and above may be scheduled to a maximum of 24 hours of continuous duty but alertness management strategies are critical. If it becomes necessary for a resident to come into the hospital while on call, he/she must document the hours in *NewInnovations*. These hours are added to the daily duty hours and at no time may the number of in-house hours exceed eighty (80) in any week. When any resident reaches seventy (70) hours they are to notify the PD for attention. Duty hours are regularly monitored by the program coordinator who notifies the PD of any irregularities. In addition the PD and faculty observe residents for evidence of individual fatigue. Residents should report any indication of fatigue involving themselves or as they perceive it in others.

Duty periods of PGY-1 residents will not exceed 16 hours in duration.

PGY-1 and PGY-2 residents should have 10 hours [and must have 8] free of duty between scheduled work.

PGY-3 and PGY-4 residents should have 8 hours free of duty between scheduled activity. If return to hospital activities with fewer than 8 hours occurs, the PD must be notified and the duty hours 'flag' will be noted in NewInnovations.

Duty hours do not include reading and preparation time spent away from the duty site.

One day is defined as one continuous 24-hour period free from all clinical, educational, and administrative activities.

Faculty Back-up:

Faculty backup is assigned to pager call every night and is immediately available as resident back-up. In addition, there is a separate rotating autopsy faculty available for all autopsies to be directly supervised after-hours. Faculty schedules are available online, distributed via email and are stored on the hospital shared drives.

BACK UP CALL POLICY

If a resident cannot perform their required duties, they must contact their supervising faculty member, the program director and the chief resident. The faculty will perform all call functions until which time a replacement resident can be provided. The chief resident is responsible for identifying a backup resident, if the primary resident's absence is prolonged.

EDUCATION, ALERTNESS MANAGEMENT AND FATIGUE MITIGATION POLICY

The program is committed to and is responsible for promoting patient safety and resident well-being in a supportive environment. Faculty members are informed of the ACGME duty hour rules and also receive education on the signs of sleep deprivation, alertness management and fatigue mitigation. If a faculty member is concerned that a resident is not fit for duty due to fatigue or illness or any cause, they will immediately report this to the program director. Residents are also informed of the ACGME duty hour rules and receive similar education on the signs of sleep deprivation, alertness management and fatigue mitigation through a variety of educational sources including the LSUHSC core curriculum modules. If a resident feels that fatigue is affecting patient care, they should call the chief resident and the faculty on-call will provide call functions.

MONITORING OF DUTY HOURS AND AT-HOME CALL

To ensure compliance with duty hour regulations put forth by the ACGME, all residents will log their duty hours in New Innovations on a regular basis. The logged duty hours are reviewed by the coordinator and PD biannually. Any violation of the ACGME mandated duty hours is to be investigated. If there are any problems that are seen as consistent or in need of intervention, the EEC will be notified.

An anonymous Duty Hour Violation Hotline is available: **504-599-1161**

AMERICAN BOARD OF PATHOLOGY: BOARD CERTIFICATION

Information regarding training requirement, eligibility and registration for certification by the American Board of Pathology. All information taken from the American Board of Pathology web site: <http://www.abpath.org/index>. and on <http://www.abpath.org/PathwayLinks.htm>

See the Booklet for the ABP exam for certification requirements:
<http://www.abpath.org/BIContents.htm>

LSUHSC Pathology Residency Policy on ABP Board Examination

Retroactively effective for all residents beginning July 1, 2010, residents should request scheduling of the ABP Examination to occur only after completion of all training. Board readiness for Spring of their PGY-IV year may be documented and granted by the CCC committee and/or PD and Department Head upon written request by the resident.

LEAVE POLICIES

Vacation leave must be requested at least two weeks in advance. Appropriate coverage of duties must be arranged prior to request for approval of leave by the section and PD. All leave approval is at the discretion of the PD and/or the supervising faculty. Resident performance as well as needs of the program may be considered in decisions regarding approval.

PGY-1 residents:
Vacation: 15 work days

All Other PGY levels:
Vacation: 20 work days

Observation of designated hospital holidays is dependent upon the rotation site and service requirements. TIC must be maintained whenever a resident takes leave.

For other types of leave including FMLA, sick and educational leave, consult the LSUHSC House officers' Manual.

Be aware, the ABP policy on leave is as follows:

“1 year of approved training credit toward ABP certification requirements must be 52 weeks in duration, and the resident must document an average of 48 weeks per year of full-time pathology training over the course of the training program. Any additional leave must be made up. Unused vacation and other leave time may not be accumulated to reduce the overall duration of training”

HOUSESTAFF RESOURCES AND SUPPORT

The LSU Housestaff organization has formal meetings and an organization with leadership opportunities. See the link: <http://residents.lsuhsu.edu/no/>

The Campus Assistance Program (CAP) offers 24 hour/day assistance to all LSU employees in resolving personal or work related problems. The number is (504) 568-8888. The web address is <http://www.lsuhsu.edu/orgs/campushealth/cap.aspx>

CASE LOG SYSTEM (ACGME)

Resident must enter into the ACGME Case Log System all autopsies, bone marrows and fine needle aspirations which they perform. Reports from this system will be printed at the time of the biannual evaluations with the program director and placed in the resident's portfolio.

ROTATIONS and SUPERVISING FACULTY

Resident rotations alternate between the various training sites. The junior residents primarily rotate at ILH but progressively rotate off-campus at our affiliated sites. All residents are expected to comply with each site's specific rules that govern residents including holiday coverage, orientation modules, paperwork, and GME check-in. Ultimately, however, the PD provides complete oversight and is available to discuss any issues that arise at any site.

The appropriate set-up is that each rotation has a 'director' assigned who practices primarily at the site of the rotation. Additional teaching faculty may also be involved in the learning experience either

via direct supervision or by providing didactic teaching sessions. See below for each rotation's full list of teaching faculty and make note of your rotational director as your main point-of-contact on site.

ROTATIONAL FACULTY and ROTATION SUPERVISORS	
Autopsy Pathology / Neuropathology	W. Newman, MD (ILH, WJ)* R. McGoey, MD (ILH, WJ) R. Craver, MD (CHNOLA) L. Del Valle, MD (LSU) B. Farris, MD (WJ)
Forensic Pathology/ Toxicology	S. Garcia, MD (JPCO)* A. Ragan, PhD (ILH) D. Troxclair, MD (JPCO) M. Sandormirsky (JPCO)
Surgical Pathology	L. Pei, MD (ILH)* B. Ruiz, MD (ILH) R. Jetly, MD (ILH) T. Dewenter, MD (ILH) R. Bhalla, MD (ILH) A. Duong, MD (ILH) W. Luer, MD (WJ)* B. Farris, MD (WJ) J. Brown, MD (WJ) R. Craver, MD (CHNOLA)* M. Stark, MD (CHNOLA) T. Carson, MD (CHNOLA) N. Davis (OCF)*
Electron Microscopy	R. Craver, MD (CHNOLA)*
Lab Management / Informatics	F. Rodriguez, MD (VA)*
Cytopathology	B. Ruiz, MD (ILH)* T. Dewenter, MD (ILH) R. Bhalla, MD (ILH)
Hematology	R. Jetly, MD (ILH)* A. Duong, MD (ILH) R. Craver, MD (CHNOLA) M. Stark, MD (CHNOLA)* B. Farris, MD (WJ)*
Flow Cytometry	R. Jetly, MD (ILH)* A. Duong, MD (ILH) L. Leiva, PhD (CHNOLA) B. Farris, MD (WJ)*
Coagulation/ Hemostasis	E. Occhipinti, MD (OCF)* C. Jackson, MD (OCF)
Medical Microscopy / Urinalysis	R. Jetly, MD (ILH)* A. Duong, MD (ILH)
Blood Banking/ Transfusion Medicine	J. Barbeau, MD (ILH)* B. Rodwig, MD (OCF)* T. Carson, MD (CHNOLA)*
Chemical Pathology / Immunopathology	F. Brazda, MD (ILH)* W. Luer, MD (WJMC)* R. Craver, MD (CHNOLA)*

Medical Microbiology	J. Barbeau, MD (ILH)* B. Farris, MD (WJ)* J. Brown, MD (WJ) W. Luer, MD (WJ)
Cytogenetics/ Molecular Pathology	C. Kletecka, MD* (ILH) P. Gregory PhD (ILH) F. Tsien PhD (ILH)
Immunopathology / Serology	F. Brazda, MD (ILH)* R. Craver, MD (CHNOLA)*
Pediatric Pathology	R. Craver, MD (CHNOLA)* M Stark, MD (CHNOLA) T. Carson, MD (CHNOLA)

*Rotation Director

AUTOPSY PATHOLOGY

Location: ILH

Length: Minimum four months

Director: W. Newman, MD (ILH, WJ)

Additional Supervising Faculty:

Robin McGoey, MD (ILH, WJ)

Goals and Objectives:

Initially an assigned faculty will provide direct supervision to the autopsy resident. Once the resident is deemed competent in basic dissection he/she will increasingly assume more responsibility for independent dissection. The PGY-1 resident, however, will always have direct supervision immediately available to him/her. The resident will review the clinical course of the patient prior to beginning the autopsy. He/she will conduct a time-out procedure that consists of: 1) a review of the clinical indications for the autopsy, 2) the legal adequacy of the permission for the autopsy including whether the case classifies as a coroner's case and 3) proper identification of the patient by at least two independent identifiers such as patient name, hospital number, date of birth, social security number. Documentation of the time-out procedure and the form of consent will be placed in the autopsy protocol. Documentation of direct supervision will be detailed in the autopsy protocol for at least the first three cases and every case thereafter in which direct supervision takes place. Following the time-out procedure, the resident plans the dissection including any tissues for culture or special studies. Whenever possible, the clinician requesting the autopsy or other clinical faculty involved in caring for the patient will be notified by the resident of the time of the performance of the autopsy prior to beginning the procedure. After completing the autopsy the resident will present the clinical and pathologic data to the attending faculty and provisional anatomic diagnoses (PADs) will be submitted to the hospital and applicable parties within twenty-four to forty eight hours. Material for histologic sections will be submitted by the resident and, once the slides are returned, the resident will prepare a microscopic description and final anatomic diagnoses (FAD) that will be appended to the gross description in the format of a final product, ie. all headers, ancillary tests, complete microscopic descriptions, slide designations, etc. are to be present. At that point, it is then the responsibility of the faculty pathologist to review the protocol and schedule the didactic session with the resident necessary for the case to be completed and signed out. Routine cases should be completed within thirty (30) working days. Sixty working days is permitted by the College of American Pathology when a case is determined by the faculty pathologist to be complex.

If clinicopathological conferences are requested by clinical departments on a decedent, it is the responsibility of the prosecuting resident to prepare the conference and present the findings.

Skill Level 1 references the first month's successful rotation in Autopsy Pathology. Skill Level II references the second month's successful rotation in Autopsy Pathology.

At the end of the PGY-I year, the resident is expected to:

1. Review and document all three components of the autopsy time-out procedure.
2. Review the patient's medical record and learn when to seek additional information from clinicians to supplement this data and to formulate a dissection to answer pertinent questions.

3. Notify the faculty pathologist of any limitations on the autopsy as well as summary of patient's history and together formulate plans for dissection.
4. Document successful completion of at least the first 3 autopsies, directly supervised.
5. Transition to dissection indirectly supervised, but immediately available in a reasonable time frame.
6. Recognize normal versus abnormal tissue be able to describe the tissues.
7. Submit appropriate tissue blocks for histology and preserve tissue in the stock container.
8. Prepare PADs for faculty review
9. Achieve timeliness in documentation as per CAP guidelines

The intermediate level (PGY II) resident should be able to:

2. Review patient's history, prepare dissection plan and inform faculty of these.
3. Independently perform the dissection without significant disfigurement of the body including modified techniques such as *en bloc* dissections, needle biopsies, aspiration of joint fluids, procurement of bone marrow, *etc.* with indirect supervision
4. Identify cases for which blood or other tissue (vitreous, *etc.*) is needed for biochemical analysis, collect the sample and order appropriate test based upon the clinical history and gross autopsy findings.
5. Present organs and review pertinent gross findings to faculty for review upon completion of dissection
6. Recognize normal versus abnormal organ weights for adult and pediatric cases
7. Prepare microscopic description of slides.
8. Demonstrate knowledge of common special stains used in autopsy/ neuropathology.
9. Complete final anatomic diagnoses and final protocol with minimal supervision
10. Prepare presentations for relevant clinical conferences
11. Complete a laboratory inspection using the College of American Pathologists checklist
12. Know current regulations regarding patient confidentiality derived from the Health Insurance Portability and Accountability Act (HIPPA) and how they affect the handling of laboratory data as well as human tissue for diagnostic and research purposes.
13. Achieve timeliness in documentation as per CAP guidelines

Residents in their final years of training are also expected to:

1. Have evident documentation in the ACGME caselog of all cases wherein he/she was the prosecuting resident, for a minimum of fifty (50) cases as expected and defined by ABP
2. Assist in supervision of junior (PGY-I) residents
3. Teach medical students observing in the procedure of autopsies
4. Have evident documentation of all scholarly activity relating to autopsy cases including power points, posters and/or publications originating from postmortem examination.

Patient Care

The pathologist acts as a consultant to the family and clinical faculty in the performance of the autopsy regarding the nature and extent of disease. The resident must exhibit a satisfactory level of diagnostic competence and the ability to provide effective pathologic consultation prior to the autopsy. The resident must exhibit proficiency with the autopsy evisceration techniques and with submission of sections for histopathology. Residents must practice effective transitions in care (TIC) when handing

off the autopsy service to another resident. The TIC checklist should be completed and signed on the final work day of the rotation. Both the donating and receiving resident involved in the TIC must abide by patient care standards in regards to diagnostic accuracy and timeliness in completion of the case. Both residents are responsible for ensuring the above noted standards. When applicable, findings will be entered into the EPIC EHR and routed to all involved clinicians.

*All autopsies must be entered into the ACGME Case Log System, and tracked cumulatively during the biannual reviews

Medical Knowledge

Residents will demonstrate established and evolving knowledge regarding disease processes as evidenced by the completeness and accuracy of microscopic descriptions, provisional and final diagnoses, and clinical-pathological statements. Residents must describe gross and histo-pathology accurately and completely. Residents must achieve knowledge of the proper application and use of special stains and/or ancillary testing. Residents must be able to use information technology systems.

Practice-based Learning and Improvement

Residents will demonstrate the capability to investigate complicated cases and use computer based literature searches to support their assertions. Residents must participate in clinicopathological case conferences and/or autopsy conferences when requested. Residents must show the capacity to teach and supervise their junior peers and/or medical students including the provision of feedback.

Interpersonal and Communication Skills

Residents will demonstrate effective, polite, and professional communication with pathology and clinical faculty and peers. Residents will demonstrate respectful and effective communication with non-physician staff, with families and with medical students. Additional communication will be assessed by the clarity and accuracy of the final autopsy protocol. Communication at the bedside will be assessed by the asking of appropriate clinical questions and by the ability to formulate accurate, concise answers to questions raised at the bedside. Residents must practice effective TIC when handing off the autopsy service, both with the incoming resident as well as with his/her attending. Both the donating and receiving resident involved in the TIC must practice effective communication skills in regards to the accuracy of information exchanged.

Professionalism

Residents must demonstrate adherence to ethical principles, sensitivity to diverse patient groups, commitment to carry out professional responsibilities, and integrity by completing reports on time, being sensitive to religious and ethnic concerns of patient's families, and recognizing the importance of confidentiality in all medical practices. The resident must maintain an adequate professional demeanor and attitude during their educational experience on autopsy pathology rotations.

System-based Practice

Residents will demonstrate an awareness and responsiveness to the health care system in which the autopsy functions including its applicability to epidemiological data. Residents must gain knowledge in the costs and benefits of the autopsy, the importance of the role of the autopsy in quality improvement in medical care and hospital services, and its service to families and society in general. Residents must adhere to the appropriate use of ancillary tests, including recognition of the cost of said testing. Residents must understand the legal mandates of autopsy permission as well as the policies of the LA Coroner system. Residents must involve themselves in quality improvement/assurance endeavors related to time-out procedures, microbiologic ancillary testing, discordance and concordance scoring of gross findings (AQuA project) and death certificate diagnoses.

Resident Evaluation

Evaluation tools may include: 360 degree (faculty, non-physician and student evaluations), checklist / specific skills evaluations, checklist / self evaluation- milestones, Scholarly activity tracking, case log entries and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

*Failure to comply with the timelines of CAP may result in the exclusion of late cases from the required fifty autopsies submitted to the Boards.

Milestones:

see specific Autopsy Milestone MK3 below; see all AP/CP and AP milestones pp. 93-96

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Daily duty hours are Mon-Friday 7:30 am – 4:30 pm; Saturday 7:00-1:00 pm. Weekend shift work will still ensure 1 in 7 days totally free from duties, when averaged over 4weeks.

If the resident is assigned to a combined autopsy/neuropathology rotation, Wednesday afternoon and the Friday work noted above are primarily set aside for neuropathology brain cutting and tissue review whenever possible.

Supervision:

At a minimum, the first three autopsies will be directly supervised by faculty. For all autopsies throughout training, indirect but directly available supervision applies. see pp. 14

Suggested Reading:

Baker, Postmortem Examination

Adams and Mader, Autopsy

Stocker and Dehner (eds), Pediatric Pathology, 2nd Ed., Lippincott-Williams &Wilkins, PA, 2001

Burger et al. 4th ed. Churchill Livingstone. Surgical Pathology of the Nervous System. 2002.

Notes:

MK3: Procedure: Autopsy: Demonstrates attitudes, knowledge and practices that enables proficient performance of gross examination (analysis and appraisal of findings, synthesize and assemble and reporting) (AP)

Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Understands the principles of confidentiality, universal precautions, chemical hazards, and personal protective equipment</p>	<p>Able to perform all 7 aspects of a routine autopsy; Properly identifies the decedent and verifies consent and limitations to extent of the autopsy Concisely reviews and presents clinical records/history; contacts the clinical team in advance of the case and summarizes questions posed by clinical team Is aware of accepted standards for turn-around time Is aware of reporting regulations, such as legal jurisdiction, statutes regarding authorization to perform autopsy (medical examiner), device reporting, communicable diseases</p>	<p>Able to plan and perform complex/difficult cases Assists in preparation of presentations for M&M, CPC, or other conferences Completes routine preliminary and final reports within standards for turn-around time Understands chain of custody, the elements of scene investigation, trace evidence and court testimony</p>	<p>Performs uncomplicated gross dissection within four hours Presents results at M&M, CPC, or other conferences and effectively answers clinical questions Completes complicated preliminary and final reports within standards for turn-around time Assesses and applies chain of custody, interprets the elements of scene investigation, trace evidence and court testimony</p>	<p>Proficient in the performance of a complete autopsy and in reporting the results in a timely manner Proficient in the presentation of results at M&M, CPC, or other conferences and answering clinical questions Proficient in the discussion of the chain of custody, interprets and assesses the elements of scene investigation, trace evidence and gives court testimony</p>

BLOOD BANKING/ TRANSFUSION MEDICINE

Location: ILH
Ochsner Health System
Children's Hospital

Length: Minimum 3months. OCF rotation to occur in combination with Coag; CHNOLA rotation to occur in combination with EM

Director: J. Barbeau, MD (ILH)
R. Rodwig, MD (Ochsner)
T. Carson, MD (CHNOLA)

Goals and Objectives:

Skill level I is applicable to PGY I and II year residents; Skill level II is applicable to residents in their final years of training. The PGY-1 resident will always have direct supervision immediately available to him/her and the initial three apheresis procedures will be directly supervised and documented as such.

I. Transfusion Service

Skill Level I references the first successful month of rotation in BB/TM.

- Demonstrate knowledge of the principles of patient/unit identification and pre-transfusion testing, including ABO/Rh testing, RBC antibody screen, and antibody identification.
- Recognize the symptoms and signs of hemolytic and nonhemolytic transfusion reactions and demonstrate knowledge of the pathophysiology, treatment, and prevention of these complications.
- Identify the major infectious complications of blood transfusions and the current risk of these infections, and explain how these infections can be prevented.
- Identify the major noninfectious complications of blood transfusions, including transfusion-related acute lung injury, the risk of these complications, and strategies to prevent them.
- Choose appropriate blood components and derivatives based on a thorough knowledge of the indications for transfusion.
- Demonstrate knowledge of the pathophysiology, prevention, and treatment of hemolytic disease of the newborn. Recognize those antibodies in pregnant patients that are clinically significant and make appropriate recommendations for blood products.
- Demonstrate knowledge of the pathophysiology and treatment of neonatal alloimmune thrombocytopenia.
- Demonstrate proficiency in the evaluation and appropriate transfusion therapy of thrombocytopenic patients (both adult and pediatric).
- Apply the principles of a massive transfusion protocol.
- Demonstrate a working knowledge of the principles of hemostasis and coagulation and proficiency in the initial treatment of patients with bleeding disorders (see also the *Hematology* section).
- Demonstrate knowledge of the transfusion requirements of special patient populations (e.g., hematology/oncology, pediatrics, geriatrics, transplantation, and urn/trauma).
- Demonstrate knowledge of landmark published studies in transfusion medicine.
- Demonstrate proficiency in evaluating and presenting findings from recent peer-reviewed journal articles related to transfusion medicine.

Skill Level II references the second successful month in BB/TM.

- Identify clinically significant RBC antibodies from an antibody panel including multiple alloantibodies and mixtures of alloantibodies and autoantibodies; determine how difficult it will be to obtain blood for this patient, and effectively communicate these results to clinicians.
- Demonstrate proficiency in evaluating and recommending treatment plans for complex transfusion reactions.
- Demonstrate familiarity with the appropriate use of highly specialized blood products (e.g., granulocytes, donor lymphocyte infusions, HLA-matched platelets, and coagulation factor concentrates).
- Demonstrate familiarity with the requirements of all applicable regulatory and accrediting agencies [e.g., JCAHO, CAP, American Association of Blood Banks (AABB), and US Food and Drug Administration].
- Compare and contrast the various means of performing blood utilization reviews.
- Demonstrate competence in the management of blood inventory and the ability to communicate effectively the hospital's needs to the blood supplier.
- Demonstrate knowledge of various methods of blood conservation, including pre- and perioperative autologous blood collection, and approaches to "bloodless" surgery.
- Demonstrate proficiency in evaluating patients refractory to platelet transfusions. Outline the principles of histocompatibility testing and platelet cross-matching and apply this knowledge in selecting appropriate platelet products when indicated (see also the *Immunology and Immunogenetics* section).
- Demonstrate proficiency in the evaluation of patients with immune-mediated and non-immune-mediated hemolytic anemia and in the appropriate transfusion management of these patients.

II. Blood Collection/Blood Center/Cell Processing Responsibilities

Skill Level I

- Compare and contrast the eligibility requirements for allogeneic and autologous blood donations.
- Demonstrate knowledge of the indications for therapeutic phlebotomy.
- Demonstrate proficiency in evaluating and treating adverse reactions associated with blood donation/phlebotomy (whole blood and apheresis donations).
- Outline the assay principles of required donor blood tests and the associated confirmatory testing and describe donor re-entry algorithms.
- Demonstrate professionalism in interactions with prospective donors.
- Summarize the steps in blood component and blood derivative preparation.
- Describe the factors that influence the motivation of volunteers to donate blood.
- Explain the operational logistics required in determining appropriate blood inventory for a geographic region and the process of meeting daily, weekly, and monthly collection goals.

Skill Level II

- Outline the necessary steps in donor notification and counseling associated with positive infectious disease testing results, and the donor look-back process.
- Demonstrate knowledge concerning the requirements of all applicable regulatory and accrediting agencies.
- Demonstrate knowledge of the principles of hematopoietic stem cell transplantation, including collection, processing, and storage of these stem cell products, and the indications for use (e.g., bone marrow, peripheral blood, and cord blood).

- Demonstrate understanding of the elements of current good manufacturing practices and current good tissue practices as they apply to the collection, processing, ex-vivo manipulation, and storage of all cellular therapeutic products (e.g., pancreatic islet cells, negative/positive selection/purging of hematopoietic stem cells, gene manipulations, donor lymphocyte infusions, dendritic cell vaccines, and ex vivo expansion of progenitor cells).
- Develop an understanding of emerging areas of cellular therapy, including hematopoietic graft engineering and cellular immunotherapeutics.

III. Therapeutic Apheresis: the initial three apheresis procedures will be directly supervised and documented. The documentation instrument can be found in the Appendix.

Skill Level I

- Summarize the principles of apheresis technology, including centrifugation, filtration, and immunoadsorption.
- Demonstrate knowledge of the indications for therapeutic apheresis and of the appropriate replacement fluids to be used in various situations.
- Demonstrate proficiency in evaluating and preparing patients for therapeutic apheresis, including discussion with the patient of the risks and benefits associated with apheresis procedures.
- Communicate effectively with clinicians and housefaculty regarding emergent or scheduled therapeutic apheresis procedures through conversations and writing of consult notes.

Skill Level II

- Demonstrate proficiency in evaluating and treating adverse reactions associated with therapeutic apheresis.
- Demonstrate proficiency in the treatment of patients using specialized methods (e.g., photopheresis and immunoadsorption columns).

Patient Care

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

Residents must practice effective transitions in care (TIC) when handing off a transfusion medicine patient either at the end of their rotational month or following an on-call interaction (PGY-II and greater). The donating resident involved in the TIC must abide by patient care standards in regards to diagnostic accuracy and timeliness in completion of the case. If the recipient of the patient is a resident, said resident is also responsible for ensuring the above noted standards.

Medical Knowledge

- Demonstrate understanding of and ability to interpret major regulations and guidelines that are applicable to collection, processing, storage, and release of blood and therapeutic products.

Practice-Based Learning and Improvement

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

Interpersonal and Communication Skills

- Demonstrate the ability to discuss the process of therapeutic apheresis with patients, and/or family members where appropriate; answer their questions; and obtain informed consent.

The residents involved in the TIC must practice effective communication skills in regards to the accuracy of clinical information on the patient not only between each other but also with his/her attending pathologist. Information exchanged should include, but is not limited to: (1) laboratory and clinical information (2) date and time of any received blood bank products with relevant associated testing, (3) the attending pathologist and clinician responsible for the case. Both residents, if applicable, are responsible for ensuring the above noted standards

Systems Based Practice

- Residents are expected to participate in the Transfusion Committee and in the Utilization Review to gain knowledge about allocation of resources, cost effective medicine and risk benefit ratio analysis

Resident Evaluation

Evaluation tools include: 360 degree (faculty and non-physician), checklist / self evaluation, checklist for BB skills (ILH), portfolio tracking via SATs, and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Additional Conferences: when possible, Transfusion Review Committee and Supervisors Blood Bank meeting (ILH), weekly trauma committee peer review and any administrative, QC/QA meetings occurring at WJ and/or OCF while rotating.

Daily duty hours are Mon-Friday, 7:30 am – 4:30 pm.

Milestones: see specific Apheresis related Milestone PC8 below; see all AP/CP and CP milestones below pp. 93-95; 97.

Procedural Supervision: see pp. 14

Suggested Reading

AABB web site. <http://www.aabb.org>.

AABB Standards for Blood Banks and Transfusion Services, 23rd ed. Bethesda, MD:, 2005.

AABB Standards for Cellular Therapy Product Services, 1st ed. Bethesda, MD, 2004.

AABB Technical Manual, 15th ed. Bethesda, MD: AABB Press, 2005.

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

PC8: Other Procedures: If training program teaches other procedures (e.g., bone marrow aspiration, apheresis, ultrasound guided FNA, etc.) (AP/CP)

Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Understands procedure and the resultant specimens and potential complications	Is aware of indications and contraindications for procedure and follows protocols and regulations	Discusses with pathology attending staff any requests that are contraindicated, obtains informed consent, and is able to assess specimen and procedure adequacy	Appropriately and professionally documents procedure and discusses with clinical team and manages complications	Proficient in the performance of the procedure

CHEMISTRY +/- IMMUNOPATHOLOGY AND SEROLOGY

Location: ILH
West Jefferson Medical Center (WJMC)
Children's Hospital

Length: Minimum three months

Director: F. Brazda, MD (ILH)
W. Luer, MD (WJMC)
R. Craver, MD (CHNOLA)

Goals and Objectives:

Skill level I is applicable to initial two rotations while Skill level II is applicable to final rotations.

I. Analytical Techniques and Instrumentation: Skill Level I

- Understand the principles and operational characteristics of analytical chemistry techniques, including photometric, electrochemical, enzymatic, electrophoretic, radiometric, chromatographic, mass spectrometric, and immunologic methods (see also the *Immunology and Immunogenetics* section).
- Understand different types of random-access automated analyzers and the measurement principles employed in these systems, including spectrophotometric, ion-selective electrode, and electrochemical methods, as well as immunologic methods, including enzyme multiplied immunoassay technique, cloned enzyme donor immunoassay, fluorescence polarization immunoassay, microparticle enzyme immunoassay, electrochemiluminescence, ELISA, turbidimetry, and nephelometry.
- Understand the basic biology of, and analytical methods for, determination of qualitative and quantitative changes in blood and fluid proteins and amino acids (enzymes, biomarkers, hormones, and cytokines), carbohydrates, lipids and lipoproteins, and clinically relevant small molecules (including metals, trace elements, and vitamins).

Skill Level II

- Understand the principles of laboratory robotics and automation strategies.
- Understand the general principles of assay calibration, QC, and the need for calibration verification.
- Understand the causes of both positive and negative interferences as well as how to detect and avoid them.
- Understand the techniques employed for specific extraction of analytes from biological fluids.
- Identify factors influencing separation and resolution in electrophoresis and chromatography, including mechanism of separation and mobile/stationary phases.
- For chromatography, understand the importance of internal standards, the relative retention time, carryover, and matrix effects.
- For mass spectrometry, understand the pitfalls of ion suppression and the need for defining characteristic ion ratios for reliable compound identification.

II. Organ-Based Biochemical Pathophysiology

1. ASSESSMENT OF PULMONARY FUNCTION: BLOOD GASES AND OXYGEN SATURATION (Skill Level I)

- Understand the principles of partial pressure of gases and the need for an O₂ carrier. Be able to describe the alveolar-arterial O₂ gradient and anion gap.
- Know the pathophysiology of ketoacidosis and lactic acidosis.

- Understand the significance of P50, O₂ content, O₂ capacity, and O₂ saturation and be able to distinguish between O₂ saturation and Po₂.
- Be able to describe the hemoglobin-oxygen dissociation curve and factors that affect the curve and P50.

• Understand the principles of integrated blood gas, electrolyte, and CO-oximetry systems.

2. ACID-BASE ELECTROLYTES, AND RELEVANT DISORDERS (**Skill Level II**)

- Define the Henderson–Hasselbach equation. Be familiar with physiologic buffer systems and the role of respiratory and renal compensation. Understand categories of clinical disorders of acid–base balance (metabolic and respiratory acidosis, metabolic and respiratory alkalosis, mixed disorders).
- Know the differential diagnosis of common electrolyte disorders.

3. ASSESSMENT OF RENAL FUNCTION (**Skill Level I**)

- Know the basic physiology of renal function. Understand the basic categories of renal diseases (e.g., prerenal azotemia, obstructive azotemia, glomerulonephritis, acute vs chronic renal failure, uremic syndrome) and be familiar with the National Kidney Foundation practice guidelines for these conditions. Know the laboratory analytical methods (e.g., Jaffe vs creatinase) for the assessment of renal function (creatinine, urea nitrogen, glomerular filtration rate) and proteinuria. Understand the concept of creatinine clearance, how it can be used to estimate glomerular filtration rate, and the various methods employed to measure it. Understand renal handling of electrolytes and key metabolites and the interpretation of urinary electrolyte measurements.
- Understand the definition of osmolality, molecules in serum that contribute to osmolality, and calculation of osmolal gap as well as the principle of the osmometer. Understand the common pitfalls and sources of error during estimation of the osmolal gap (e.g., hyperproteinemia, hyperlipidemia, hypermagnesemia). Understand the differential diagnosis of an unexplained, increased osmolal gap, including alcohol or glycol ingestion, alcoholic or diabetic ketosis or ketoacidosis, and osmotherapy (e.g., mannitol or glycerol administration), among others. Understand the principles of fluid balance.

4. CARDIAC BIOMARKERS (**Skill Level I**)

- Know the current definition of myocardial infarction by the European Society of Cardiology/American College of Cardiology guidelines and the New York Heart Association classifications and understand the interaction of diagnostic modalities in its definition (electrocardiogram, laboratory testing, and imaging).
- Know the diagnostic and prognostic significance as well as the limitations of current coronary artery disease biomarkers [troponins I and T, creatinine kinase (CK-MB index and isoforms), and myoglobin].
- Know the pathophysiology and evaluation of congestive heart failure. Understand the markers of congestive heart failure [B-type natriuretic peptide (BNP) and N-terminal fragment of the BNP prohormone (NTproBNP)] and their biological and technical limitations.
- Understand the utility of markers of inflammation in the evaluation of cardiac risk (e.g., homocysteine and C-reactive protein).

5. ASSESSMENT OF LIVER AND BILIARY TRACT STATUS (**Skill Level I**)

- Understand the dynamics and mechanisms of liver enzyme release and the clinical utility of measuring hepatic enzymes (e.g., aspartate aminotransferase, alanine aminotransferase, γ -glutamyltransferase, alkaline phosphatase, and lactate dehydrogenase).
- Know the biochemical assessment of liver function by nonenzyme analytes such as albumin, ammonia, bile acids, bilirubin, urea nitrogen, cholesterol, total protein, and triglycerides.
- Understand bilirubin metabolism, fractionation of bilirubin (conjugated, unconjugated, δ -bilirubin, direct vs indirect) and unique aspects of neonatal bilirubin. Understand the conditions and genetic

defects that affect bilirubin metabolism, transport and clearance (e.g., Gilbert disease and Dubin–Johnson syndrome).

6. ASSESSMENT OF THYROID FUNCTION (Skill Level I)

- Understand the structure, biosynthesis, secretion, and metabolism of thyroid hormones [thyroxine (T₄), triiodothyronine(T₃), and reverse T₃ (rT₃)]. Know thyroid physiology and control of thyroid function [thyrotropin-releasing hormone (TRH) and thyrotropin (TSH)].
- Know the common causes of hypothyroidism and hyperthyroidism.
- Know the laboratory tests for evaluation of thyroid disorders and be able to interpret these analytes in their clinical context with an appreciation for the euthyroid sick state.
- Be familiar with current analytical methodologies for thyroid testing (TSH methods: 1st-, 2nd-, and 3rd generation assays; isotopic and nonisotopic methods; T₄; free T₃ methods; T₄-uptake methods; TSH suppression and stimulation tests).

7. ASSESSMENT OF PITUITARY FUNCTION (Skill Level I)

- Understand the physiological action, biochemistry, and regulation of anterior pituitary hormones [adrenocorticotropic hormone (ACTH), growth hormone (GH), prolactin (PRL), luteinizing hormone (LH), follicle-stimulating hormone (FSH)] and of posterior pituitary hormones [antidiuretic hormone (ADH) and oxytocin].
- Understand endocrine tests of hypothalamic-pituitary function (cosyntropin test/rapid ACTH stimulation test, insulin hypoglycemia test, metyrapone test, levodopa test, arginine infusion test, glucose-GH suppression test, TRH test, gonadotropin-releasing hormone (GnRH) test, clomiphene test, corticotropin-releasing hormone (CRH) test, gonadotropin-releasing hormone test, water deprivation test, saline infusion test, and water loading test). Understand the pathophysiology of disorders of the pituitary.

8. ASSESSMENT OF ADRENAL FUNCTION (Skill Level I)

- Understand the physiological action, biochemistry, biosynthesis, chemical structure, and metabolism of glucocorticoids and mineralocorticoids.
- Understand the physiological regulation of the renin-angiotensin-aldosterone system.
- Understand clinical conditions associated with excess and deficiency of adrenal cortex hormones. Understand testing of the functional status of the adrenal cortex [basal values vs stimulation tests and suppression tests, circadian rhythm of corticosteroids, morning ACTH, cortisol (urinary, random, and free), rapid ACTH cortisol stimulation test, multiday ACTH stimulation, metyrapone stimulation, CRH stimulation, and quantitative serum and urinary steroid hormone panels].
- Understand the synthesis and metabolism of biogenic amines, including catecholamines and serotonin.
- Be familiar with the strengths and weaknesses of tests available for evaluation of disorders of the adrenal medulla, such as pheochromocytoma or neuroblastoma.

9. ASSESSMENT OF REPRODUCTIVE FUNCTION, (Skill Level II)

- Understand the role of sex hormones in reproduction and the evaluation of pregnancy and reproductive dysfunction, such as menstrual disorders and infertility.
- Understand the importance of demographic data and biochemical assessment in prenatal testing for fetal defects.

10. GASTRIC, PANCREATIC, AND INTESTINAL FUNCTION (Skill Level I)

- Understand the clinical manifestations of gastric, pancreatic, and intestinal disease and diagnostic methodologies such as the breath tests for *Helicobacter pylori*, fecal occult blood, lipase, and

amylase (e.g., fractionation of amylase; pancreatic vs salivary and amylase/creatinine clearance ratio).

- Appreciate the role of gastrointestinal hormones and enzymes in digestion and the evaluation of malabsorption and diarrheal syndromes.

11. GLUCOSE AND EVALUATION OF DIABETES MELLITUS **(Skill Level I)**

- Understand the metabolism of carbohydrates (insulin, C-peptide, and other regulatory hormones) and be familiar with the American Diabetes Association (ADA) definitions of impaired fasting glucose, impaired glucose tolerance, type 1 and type 2 DM criteria for diabetic ketoacidosis and hyperosmolar hyperglycemic state, as well as gestational diabetes. Understand the underlying pathophysiology of different forms of diabetes.
- Understand the diagnosis and laboratory assessment of diabetes (blood glucose, oral glucose tolerance test, hemoglobin A1c, fructosamine, and urinary microalbumin) and its complications.
- Understand the diagnosis and evaluation of hypoglycemia.

12. ASSESSMENT OF MINERAL AND BONE METABOLISM **(Skill Level I)**

- Understand the biochemistry and physiology of calcium, phosphate, and magnesium.
- Know the hormones that regulate mineral metabolism [parathyroid hormone (PTH), calcitonin, and vitamin D] as well as parathyroid hormone-related protein (PTHrP). Understand various PTH assays, including biointact PTH and intraoperative PTH.
- Know the pathophysiology of metabolic bone diseases such as osteoporosis, osteomalacia, and Paget disease.

13. ASSESSMENT OF PORPHYRINS **(Skill Level II)**

- Understand the biochemistry of heme and porphyrins.
- Understand the porphyrias and be able to consult on the selection and interpretation of both screening and diagnostic tests for each disorder.

14. TUMOR BIOMARKERS

Skill Level I:

- Be familiar with the definition, classification, biochemistry, and distribution of tumor markers, both protein and carbohydrate, including, but not limited to, prostate-specific antigen, calcitonin, human chorionic gonadotropin, α -fetoprotein, carcinoembryonic antigen, CA 15-3, CA 125, and CA 19-9.
- Know the limitations of laboratory assessment of various tumor markers and the factors affecting the results of different analytical procedures.
- Understand the conceptual basis of assays used to screen for malignancy, including Bayes theorem.
- Be familiar with ongoing efforts to identify proteomic patterns **(Skill Level II)**

15. ASSESSMENT OF FETAL LUNG MATURITY **(Skill Level II)**

- Understand the physiology of respiratory distress syndrome.
- Understand fetal lung maturity testing [lecithin/sphingomyelin (L/S) ratio, phosphatidyl glycerol (PG), foam stability index (FSI or shake test), fluorescence polarization, and counting of lamellar bodies]. Understand the biochemistry, physiology, and diagnostic performance of fetal fibronectin.

16. TRACE ELEMENT ASSESSMENT **(Skill Level II)**

- Understand the biochemistry, physiology, and metabolism of trace elements (iron, magnesium, zinc, copper, selenium, cobalt, and fluoride). Know the biochemistry and clinical significance of metal-binding proteins such as transferrin, ferritin, and ceruloplasmin.
- Know the clinical assessments of trace elements (serum iron, iron-binding capacity, transferrin, transferrin saturation, serum ferritin, zinc protoporphyrin, and serum ceruloplasmin).

17. VITAMIN ASSESSMENT (Skill Level I)

- Know the definition and classification of vitamins: fat-soluble vitamins (A, D, E, and K) and water-soluble vitamins [B1, B2, B6, B12 (cobalamin), C, niacin, nicotinamide, folic acid, biotin, and pantothenic acid].
- Understand the clinical disorders associated with the deficiency as well as toxicity of vitamins.

18. CHOLESTEROL AND LIPID ASSESSMENT (Skill Level I)

- Understand the chemical structures, biosynthesis, classification, function, and metabolism of lipids and lipoproteins.
- Understand the Fredrickson classification and the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (ATP III) classification of hyperlipidemia.
- Understand the pathophysiology of lipid disorders.
- Know the principles of analytical techniques for laboratory assessment of lipids.

19. SERUM AND FLUID PROTEIN AND AMINO ACID ASSESSMENT (Skill Level I)

- Understand the principles of protein analysis in body fluids (e.g., Kjeldahl and Biuret methods, refractometry, and qualitative dipstick).
- Know the principles of serum, urine, and cerebrospinal fluid (CSF) protein electrophoresis. Recognize key patterns of dysproteinemias and monoclonal gammopathies (see also the *Immunology and Immunogenetics* section).
- Understand approaches for distinguishing transudates vs exudates in fluids.
- Know the analytical methods involved in genetic and acquired aminoacidurias and the current guidelines for screening neonates for these disorders.
- Understand the emerging technology of proteomics and its potential applications in clinical diagnostics. (Skill Level II)

20. CLINICAL ENZYME KINETICS (Skill Level II)

- Understand the principles of enzyme kinetics (e.g., Michaelis–Menten equation, concepts of K_m , V_{max} , and zero-order and first-order kinetics) and clinical enzymology, including isoenzymes, isoforms, and tissue distribution.
- Be familiar with the principles of analytical enzymology and know the concepts of activity vs mass assays (e.g., CK vs CK-MB assays).

21. PEDIATRIC BIOCHEMISTRY (Skill Level I)

- Understand the differences and unique aspects of pediatric and neonatal chemistry, including reference ranges.

III. POINT-OF-CARE TESTING: Skill Level I

- Understand definitions of POCT and waived testing.
- Understand the range of analytes available in devices used at the point of care.
- Understand the impact of POCT on clinical care, in terms of volume of tests performed, turnaround time, and the utilization of common POC tests (e.g., bedside glucose, rapid strep, and activated clotting time).

- Understand the differences in reference ranges and test performance characteristics between POCT and central laboratory assays.
- Appreciate the difference between POCT and nearpatient testing and the personnel resources that best accomplish quality testing in these distinct situations.

Skill Level II

- Understand the principles of performance for common POC tests such as glucose, urine drugs of abuse, rapid microbial antigen, and activated clotting time. Understand the performance characteristics of the common POC devices used for these tests. Know the issues surrounding specimen collection and preparation and the limitations and interpretation of results.
- Understand the quality principles of POCT, including QC of unit-use testing devices, and proficiency/competency assessment of testing with multiple sites and operators and diverse testing personnel.
- Understand the regulatory, administrative, and operational context of POC, waived, and home testing.
- Be able to assess economic, workflow, human resources, and clinical factors driving the decision to perform testing at the point of care vs the central laboratory.
- Know the most common test systems used in POCT.
- Develop an appreciation of emerging POCT technologies, including microelectrical mechanical systems (MEMS) and other biosensor techniques, and their potential clinical applicability.

IV. IMMUNOPATHOLOGY AND SEROLOGY

1. IMMUNOGLOBULIN QUANTITATIVE AND QUALITATIVE DISORDER: Skill Level I

- Understand the basic biology of immunoglobulins.
- Know the structure of immunoglobulin molecules.
- Know the classes of immunoglobulins and the types of immunoglobulin fragments.
- Understand the function and binding sites of various portions of immunoglobulin molecules.
- Understand the mechanisms for generation of immunoglobulin diversity.
- Understand the mechanisms of heavy chain class switching and the major regulators of class switching.
- Understand the timing and pattern of antibody development after normal immunization and in response to acute and chronic infection.
- Understand the principles of protein electrophoresis and immunofixation.
- Interpret the protein electrophoresis patterns observed in normal serum, normal plasma, normal urine, and in large monoclonal gammopathies such as multiple myeloma and Waldenstrom macroglobulinemia.
- Interpret protein and clinical findings in patients with monoclonal gammopathy of undetermined significance.
- Understand findings and electrophoresis patterns in immunoglobulin light chain (AL) amyloidosis.
- Understand and interpret findings in sera with oligoclonal banding.
- Understand and interpret CSF oligoclonal banding patterns.
- Understand and interpret pattern of proteinuria in nephrotic syndrome.
- Develop proficiency in interpretation of protein electrophoresis and immunofixation tests.
- Be able to recommend follow-up testing for abnormal or equivocal cases.
- Be able to recommend and interpret special electrophoretic procedures, including chemical reduction, use of special antisera, etc.

2. AUTOIMMUNE DISEASES: Skill Level I

- Understand the principles of autoimmunity and the major autoimmune diseases.

- Understand theories of immunological tolerance and anergy.
- Understand clinical features, pathogenic principles, and diagnostic approaches to multisystem autoimmune diseases such as rheumatoid arthritis, systemic lupus erythematosus, Sjogren syndrome, antiphospholipid syndrome, and related autoimmune rheumatic diseases.
- Understand patterns observed in immunofluorescence tests for antibodies to nuclear antigens and understand the use and interpretation of tests for antibodies to specific antigens such as DNA, Sm, RNP, SSA/Ro, SSB/La, Jo-1, and Scl-70/topoisomerase.
- Understand tests for rheumatoid factors and antibodies to cyclic citrullinated peptide (antiCCP) in rheumatoid arthritis evaluation.
- Understand the principles and performance of tests for antibodies to cardiolipin, β -2 glycoprotein I, and related phospholipids and phospholipid-binding proteins, and know integrated interpretation of those tests together with lupus inhibitor tests.
- Understand the interpretation of complement protein and functional measurements in immune complex-mediated disorders.
- Understand the clinical features and immunologic approaches to evaluation of organ-specific autoimmune diseases, such as autoimmune thyroid disease, pernicious anemia, type I diabetes mellitus, celiac disease, and immune-mediated liver disease.
- Be familiar with tests for antibodies to thyroglobulin, thyroid peroxidase/microsomes, and TSH receptor; parietal cells and intrinsic factor; insulin, glutamic acid decarboxylase, and islet cells (including ICA512/IA-2); tissue transglutaminase, gliadin, and endomysium; and mitochondria, smooth muscle, soluble liver antigen, and liver-kidney-mitochondria antigens.
- Understand the clinical features and diagnostic approaches to autoimmune hematologic diseases, including immune-mediated hemolytic anemia and immune thrombocytopenia.
- Understand theories of pathogenesis of multiple sclerosis and know how to interpret CSF findings associated with multiple sclerosis.
- Develop proficiency in interpretation of direct and indirect immunofluorescence microscopy tests for diagnosis of autoimmune diseases.
- Develop proficiency in use of clinical and laboratory data to diagnose and assess disease activity of autoimmune diseases.

3. INFECTIOUS DISEASE SEROLOGY: PRINCIPLES & GENERAL APPLICATIONS: **Skill Level I**

- Understand the typical time course of appearance and disappearance of serum antigens and antibodies used in diagnosis of major infectious diseases, including:
 - Protozoal infections: understand immunologic approaches to assessment of exposure to toxoplasma, schistosoma, trypanosoma, and others.
 - Understand and be able to interpret nontreponemal and treponemal antibody tests used to diagnose syphilis.
 - Understand typical antibody response to immunization with hepatitis A vaccine, hepatitis B vaccine, and rubellavaccine.
- Be able to provide consultation regarding need for immunization after measurement of antibodies to determine protective levels of antibodies.
- Develop competence in ability to provide recommendations regarding need for passive immunization with antibody preparations after exposure of vulnerable patients.

4. LABORATORY ASSESSMENT OF ALLERGIC DISEASES: **Skill Level I**

- Understand the use of measurement of antigen-specific IgE concentrations to assess diagnosis of specific allergies and comparison with use of in vivo skin tests.
- Understand principles of pathogenesis of allergic disorders and laboratory tests to assess mast cell degranulation.

5. INNATE IMMUNITY AND INFLAMMATION: **Skill Level I**

- Understand the role of the complement system or proteins in health and disease.
- Understand the use of complement protein measurements to assess inherited and acquired deficiency states, including deficiency of complement components and deficiency of regulatory proteins such as C1-esterase inhibitor.
- Understand the role of complement protein measurements to assess activation of the complement system.
- Understand the acute-phase response and acute-phase proteins, such as C-reactive protein, to assess inflammatory conditions.
- Understand cytokines as mediators and markers of immune and inflammatory responses. Understand classification of cytokines, including those associated with helper T-cell subsets (Th1 and Th2), inflammatory conditions, etc.
- Understand principles of inflammatory response mediated by cellular receptors (e.g., toll-like receptors) for substances with repeating molecular patterns, such as lipopolysaccharide/endotoxin, DNA, and RNA.
- Be familiar with the proposed role of natural killer cells in innate immune response to tumors and infectious agents.

6. IMMUNE DEFICIENCY DISORDERS: **Skill Level I**

- Understand the cells that comprise the immune system and the principles of structural and functional evaluation of B cells, T cells, natural killer cells, and phagocytic cells.
- Understand the role of the T-cell receptor, processed antigen peptides, HLA class I and class II molecules, cytokines, and accessory molecules/costimulation in antigen presentation and formation of the acquired immune response.
- Understand the principles of lymphocyte development, including rearrangements of the B-cell receptor/immunoglobulin genes and the T-cell receptor genes.
- Understand the principles of classification of primary immune deficiency diseases, including defects in humoral immunity, cellular immunity, phagocytic cell function, and complement components, and the infections and neoplasms typically associated with each type of defect.
- Know the more common primary immune deficiency disorders.
- Understand the role of flow cytometry, gene studies, and functional assessments in evaluation of immune deficiency disorders.
- Understand assessment of lymphocyte immunophenotyping and activation, and be able to interpret flow cytometry data used to characterize leukocyte populations.
- Understand the immune pathogenic principles of acquired immunodeficiency disorders.
- Understand mechanisms of immunosuppressive and major antiinflammatory drugs, including effects of alkylating agents such as cyclophosphamide; antimetabolites such as methotrexate and mycophenolate; cytokine antagonists, including tumor necrosis factor- α antagonists; adhesion molecule inhibitors; and costimulatory molecule inhibitors and antagonists.
- Understand effects of drugs designed to deplete target cell populations, such as rituximab to deplete B cells and anti-thymocyte globulin to deplete T cells, and uses of flow cytometry and other techniques to monitor efficacy or toxicity of those drugs.
- Be able to recommend appropriate algorithms for evaluation of patients with undiagnosed immune deficiency disorders.
- Understand interpretation of complex, multimodality testing for diagnosis of immunodeficiency.
- Understand principles of neutrophil and phagocyte function assays and methods to evaluate results.

7. IMMUNOGENETIC METHODS AND INDICATIONS IMMUNE TESTING: **Skill Level I**

- Know the nomenclature and be able to describe the organization and polymorphism of the human major histocompatibility complex, including HLA class I, II, and III genes.
- Understand the basic function, protein structure, and cell expression of HLA class I and class II gene products.
- Understand the role of HLA typing in organ and bone marrow/stem cell transplantation and how HLA antigen mismatching results in allogeneic reactions in recipients.
- Understand clinical presentations and laboratory assessment of acute and chronic graft-vs-host disease.
- Understand clinical presentations and basic mechanisms of rejection, including hyperacute rejection, acute rejection, and chronic rejection of various organs.
- Know HLA typing techniques, including serological methods, microcytotoxicity assays, nucleic acid assays (such as sequence-specific primer amplification, direct sequencing, and sequence-specific oligonucleotide hybridization), and lymphocyte culture techniques.
- Understand approaches to evaluate the humoral response to transplantation antigens, including crossmatching and panel reactive antibody (PRA) screens using cell-based methods (e.g., cytotoxicity and flow cytometry) and antigen-based methods (e.g., ELISA and bead counters).
- Understand the association of particular HLA alleles with disease and understand the test procedures used for nontransplant clinical purposes, e.g., to test for HLA-B27 in assessment of disease association or risk.
- Demonstrate familiarity with standards for histocompatibility and reporting set forth by the United Network for Organ Sharing, American Society of Histocompatibility and Immunogenetics, National Marrow Donor Program, and CAP.
- Understand the HLA test procedures and protocols (including initial evaluation and living and deceased donor workups) used for solid-organ transplantation.
- Understand the procedures, including testing for PRAs, used for the periodic update of patient eligibility.
- Understand classification of donor and recipient matching and mismatching, including criteria for unacceptable HLA antigen matches.
- Be aware of laboratory tests required to prevent infections spread by transplantation.
- Understand the HLA test procedures and protocols used for hematopoietic stem cell/bone marrow transplantation, including initial evaluation and final donor selection for both related and unrelated donors, and role of identity testing to assess engraftment.
- Understand the HLA test procedures and protocols used for transfusion support, particularly regarding initial evaluation and selection of HLA matched platelets.
- Demonstrate an ability to select appropriate HLA test methodologies.
- Demonstrate competence in troubleshooting and resolving technical problems.
- Demonstrate an ability to prepare comprehensive HLA test reports that include pertinent information and test interpretation.
- Show an ability to assist requesting physicians in the appropriate use and interpretation of HLA tests.
- Understand methods to assess chimerism after stem cell or bone marrow transplants.
- Understand methods to test parentage.
- Understand management of histocompatibility laboratory operations, such as the need for emergency typing and cross-matching and laboratory receiving and processing functions.

II. Methods of Clinical Immunology Laboratory Testing: **Skill Level I**

- Understand methods of antigen and antibody testing, and reasons for choosing different types of assays for different analytes based on sensitivity/minimal detectable dose, reagent costs, purity of immunizing substances, etc.

- Understand principles of test performance, QC, and troubleshooting for immune methods including: Methods based on protein and particle aggregation, such as agglutination, nephelometry, and turbidimetry; double diffusion; and immunofixation after protein electrophoresis; Methods based on detection of labeled antigen or antibody in competitive and noncompetitive sandwich immunometric assays, including RIA, enzymelinked immunoassays, and chemiluminescence immunoassays; Tissue-based immunoassays, including immunofluorescencemicroscopy and immunohistochemistry; RAST tests and other tests for allergen-specific IgE; Immune complex assays, including tests for cryoglobulins; Flow cytometry methods.
- Cell-mediated immunity tests, such as proliferation, ELISPOT, and cytolytic activity assays as well as skin tests.
- Phagocytic function tests.
- Molecular biological techniques as applied to immunology testing.
- Understand and know how to evaluate, prevent, and correct for immunological interferences associated with immunoassays, including: Human anti-mouse antibodies; Rheumatoid factors; Heterophilic antibodies reacting with immunoglobulins from multiple species; Autoantibodies to measured substances; Cryoglobulins and cold agglutinins.

Patient Care

Residents gather relevant clinical information from patient data systems and/or patient charts as well as discussion with clinicians. Formulate diagnostic testing algorithm with patient centered, patient safety approach

Medical Knowledge

Residents will demonstrate knowledge about evolving diagnostic scientific practice by developing differential diagnoses based on clinical and laboratory data. Recommend additional testing as appropriate and synthesize these into an appropriate testing algorithm.

Practice-Based Learning and Improvement

Residents will demonstrate the ability to analyze testing methods and apply from one case to the next. Residents must correlate their diagnostic approach with those rendered by clinical and pathology faculty. Residents will investigate complicated cases, assess their diagnostic and consultative service, and incorporate scientific evidence into their practice for the continual improvement of their patient care. 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

Residents will demonstrate effective, respectful, and professional communication with other health care professionals, patients and patient's families when applicable. This will be evaluated by faculty observation of resident performance on individual cases.

Professionalism

Residents must demonstrate respect, integrity, compassion, sensitivity to diverse patient populations, a commitment to medical ethics and professional responsibilities, and a responsiveness to patient's needs that supercedes their own self interest. This may be evidenced by nondiscriminatory, equitable testing approaches to similar diagnostic situations, being sensitive to religious concerns of families, and recognizing the importance of confidentiality especially with tissue typing and informed consent in medical practice. Residents must also exhibit appropriate behavior with peers, clinicians, faculty, and technical, clerical and administrative faculty. This is evaluated by close personal observation of pathology faculty and faculty in their daily interactions with residents.

Systems-Based Practice

Residents will demonstrate an awareness of and responsiveness to the health care system context in which the laboratory must function. This includes an understanding of how the diagnoses they render affect health care decisions for patients and the health care system. Residents must understand the importance of rational use of specialized tests in order to provide cost-effective care without compromising quality. Residents must understand the importance of quality assurance and participate in performance improvement committee activities as they relate to improving functions within the laboratory as well as the laboratory's interactions with the larger health care system.

Resident Evaluation

Evaluation tools include: 360 degree (faculty, non-physician), checklist / self evaluation, portfolio tracking via SATs and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones:

see AP/CP and CP related Milestones below pp. 93-95; 97

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Daily duty hours are 7:30 am – 4:30 pm

Suggested Reading:

Burtis CA, Ashwood EA, Bruns DE, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 4th ed. St. Louis, MO: Saunders, 2006.

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

Abbas AK, Lichtman AH. Cellular and Molecular Immunology, 5th ed. Philadelphia: WB Saunders, 2005.

Notes:

Coagulation / Hemostasis

Location: Ochsner Clinic Foundation (OCF)

Length: 0.5 month, often in combination with BB/TM at OCF

Director: Elise Occhipinti, MD (OCF)

Additional Supervising Faculty: Li Huang, MD (OCF)
CeCe Jackson, MD (OCF)

Skill Level differentiation: N/A. <One month rotation requirement

Goals and Objectives:

- Understand the clinical utility of coagulation and thrombosis testing.
- Develop basic understanding of hemostatic and thrombotic disorders:
- Understand the coagulopathy of liver disease, vitamin K deficiency and antagonism; disseminated intravascular coagulation; hemophilia (A, B, and C), arterial and venous thrombosis.
- Understand the general principles of screening coagulation tests (e.g., prothrombin time, activated partial thromboplastin time, fibrinogen, and thrombin time), International Normalized Ratio derivation and its clinical significance, effect of hematocrit and blood-drawing technique on anticoagulation of blood samples for coagulation testing.
- Demonstrate competency in taking a bleeding and thrombosis history.
- Understand results of mixing studies and factor assays to guide further coagulation testing.
- Understand the principles of tests involved in the identification of lupus anticoagulant and antiphospholipid antibody syndromes.
- Recognize the effect of circulating anticoagulants on coagulation testing.
- Understand the monitoring of anticoagulation therapy.
- Understand the action of direct thrombin inhibitors and their effect on coagulation testing.
- Understand the principles of molecular analysis of thrombotic risk factors [e.g., factor V Leiden, prothrombin G20210A, and methylenetetrahydrofolate reductase (MTHFR)].
- Understand the principles of functional and antigenic assays for proteins of the anticoagulation and fibrinolytic systems.
- Interpret results of testing and recommend further studies as needed.
- Summarize laboratory evidence for hemostatic and thrombotic disorders and be able to assess and explain bleeding and thrombosis risk.
- Interpret results of Bethesda assays for factor inhibitors, fibrinolytic therapy testing, heparin-induced thrombocytopenia testing (ELISA vs serotonin release /platelet aggregation studies)
- Understand monitoring and complications of biologics as drugs (e.g., recombinant activated protein C and recombinant F VIIa).

Patient Care:

Residents gather relevant clinical information from on-line patient data systems and/or patient charts as well as discussion with clinicians. Interpret coagulation panel testing. Knowledge about clinical coagulopathies and ability to correlate to patient cases.

Medical Knowledge:

Residents will demonstrate knowledge about clinical coagulopathies and the diagnostic workup. Residents will learn to apply molecular and additional ancillary testing to the workup. Residents will have a general knowledge about the therapeutic approach to the coagulopathic patient.

Practice-Based Learning and Improvement:

Residents will demonstrate the ability to analyze their practice experience by systematically evaluating their testing algorithms for improvement. Residents must correlate their diagnoses with those rendered by faculty and thus guide their learning to improve diagnostic capabilities. Residents will investigate complicated cases, assess their diagnostic and consultative service, and incorporate scientific evidence into their practice for the continual improvement of their patient care.

Interpersonal Communication Skills:

Residents will demonstrate effective, respectful, and professional communication with patients, health care professionals, and other physicians. Residents, when applicable, will present at interdisciplinary conferences.

Professionalism:

Residents must demonstrate respect, integrity, compassion, sensitivity to diverse patient populations, a commitment to medical ethics and professional responsibilities, and a responsiveness to patient's needs that supercedes their own self interest. This may be evidenced by timely response to coagulation consultations. Residents must also exhibit appropriate behavior with peers, clinicians, faculty, and technical, clerical and administrative faculty. This is evaluated by close personal observation of faculty and by various evaluation instruments.

Systems-Based Practice:

Residents will demonstrate an awareness of and responsiveness to the health care system context in which a coagulation consultative service must function. This includes an understanding of how the diagnoses they render affect health care decisions for patients and the health care system. Residents must understand the importance of rational use of specialized tests in order to provide cost-effective care without compromising quality. Residents must understand the importance of quality assurance and participate in performance improvement committee activities as they relate to improving functions within the laboratory as well as the laboratory's interactions with the larger health care system.

Resident Evaluation

Evaluation tools include: 360 degree (faculty, non-physician), checklist / self evaluation, portfolio tracking via SATs, and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones: see AP/CP and CP related Milestones above pp. 93-95 and 97.

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.
Additional Conferences: Wednesday 4-5pm Hematology Case Conference pm
Daily duty hours are Mon-Friday, 7:00 am – 5:00 pm

Suggested Reading:

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

CYTOPATHOLOGY

Location: ILH

Length: Minimum three months

Director: B. Ruiz, MD (ILH)

Additional Supervising Faculty: T. Dewenter (ILH)
R. Bhalla (ILH)

Goals and Objectives:

Skill level I is applicable to initial rotation while Skill level II is applicable to final rotations.

Skill Level I

- Capable of verifying that cytopathology requisitions are completed accurately.
- Demonstrate familiarity with the methods of collection, cytopreparatory processing, and turn around times for common cytopathology specimens, in order to be able to answer clinicians' questions regarding expected results.
- Demonstrate knowledge of Bethesda System terminology for reporting on gynecologic cytopathology specimens, and of the principles and application of human papillomavirus probe analysis.
- Demonstrate knowledge of the elements of adequacy and the current laboratory reporting system for fine needle aspiration (FNA) biopsy and exfoliative non-gynecologic cytopathology specimens from the various commonly sampled body sites.
- Demonstrate knowledge of the cytopathologic features of normal, reactive, infectious, dysplastic and neoplastic conditions as seen in common cytopathology specimens.
- Demonstrate knowledge of how common cytopathology specimens are screened.
- Demonstrate knowledge of how to evaluate common cytopathology specimens comprehensively.

Skill Level II

- Demonstrate knowledge of the application of ancillary techniques including image analysis, immunocytochemistry, flow cytometry, cytogenetics, electron microscopy, and molecular studies (FISH, PCR).
- Demonstrate knowledge of rapid evaluation of common FNA biopsy specimens, including determination of specimen adequacy and the need for ancillary techniques, and the appropriate collection of materials for such techniques.
- Demonstrate capability, under faculty supervision, of obtaining patient history and informed consent, competently examining lesion to be biopsied, preparing patient, correctly performing FNA procedure, preparing, staining and examining the obtained material for adequacy, providing preliminary diagnosis, and appropriate patient after care.
- Demonstrate knowledge of how clearly, concisely, and completely to compose a cytopathology report for specimens from various commonly sampled body sites based upon the final diagnostic findings, and of how appropriately to recommend clinical follow-up.
- Demonstrate familiarity with the principles of automated screening for gynecologic cytopathology specimens.
- Demonstrate knowledge of how to perform quality assurance, including the correlation of gynecologic and non-gynecologic cytopathology with surgical pathology, both in aggregate for quality assurance purposes and on a case-by-case basis for diagnostic purposes.

-Demonstrate knowledge of how to apply concepts of quality control, quality improvement, risk management, and of regulatory compliance including correct coding as these pertain to the practice of cytopathology.

Residents in their **final year of training** (PGY-IV) are also expected to:

1. Have evident documentation in the ACGME caselog of all FNAs
2. Formulate provisional diagnoses on all aspirated material prior to faculty final diagnoses
3. Assist in supervision of junior residents and/or medical students in performing FNAs
4. Have evident documentation of all scholarly activity relating to cytology cases including power points, posters and/or publications

Patient Care:

Residents must demonstrate the ability to gather pertinent clinical history, clinical and laboratory data on cytopathology cases. Residents should act as an effective consultant to clinicians in regards to cytopathology material. Residents should obtain proficiency in previewing cytopathology cases, diagnosing a FNA, performance of a FNA, and assessment of adequacy of radiology guided aspirates. Residents should demonstrate appropriate bedside staining procedures.

*All FNA procedures must be entered into the ACGME Case Log System, and tracked cumulatively during the biannual reviews

Medical Knowledge:

Residents should have a clinical knowledge base about cytopathological diagnoses. They should demonstrate proper application and use of special stains/ ancillary testing and be able to apply learned items from each case to future similar cases.

Practice-Based Learning and Improvement:

Residents should have the capacity to utilize multiple sources, including information technology, to optimize lifelong learning and support patient care decisions. Residents must use study set material and reading material. Residents should supervise/ teach more junior residents and prepare and present, whenever possible, at multidisciplinary cyto-histo correlation conferences.

Interpersonal and Communication Skills:

Residents will demonstrate effective, polite, and professional communication with pathology and clinical faculty and peers. Residents will demonstrate respectful and effective communication with non-physician staff and with families and medical students. Additional communication will be assessed by the clarity and accuracy of the ability to explain the FNA procedure to patients. Communication at the bedside will continue to be assessed by the asking of appropriate clinical questions and by the ability to formulate accurate, concise answers to questions raised at the bedside. Residents should demonstrate skills in obtaining informed consent, including effective communication to patients about procedures, alternative approaches, and possible complications. Able to give reasonable suggestions for clinical follow-up based upon Pap test diagnoses

Professionalism:

Residents will maintain a professional attitude and demeanor during cytopathology experiences. Residents will demonstrate compassion and be understanding and respectful of their patients including regard for privacy, religious, ethnic, sexual, or educational differences. Residents should demonstrate positive work habits, including punctuality; dependability, and professional appearance. Adherence to guidelines and regulations set forth by regulatory and accrediting agencies. Residents should adequately prepare their cytopathology cases prior to final review with faculty.

Systems-Based Practice:

Residents will demonstrate an awareness and responsiveness to the health care system in which the cytopathology service functions including its applicability to diagnostic and therapeutic medicine. Residents must gain knowledge in the costs and benefits of the FNA, pap smear and the importance of the role of cytopathology in quality improvement in medical care and hospital services, and its service to families and society in general. Residents must adhere to the appropriate use of ancillary tests, including recognition of the cost of said testing. Residents must understand the legal mandates of informed consent. Residents must involve themselves in the bimonthly quality improvement/assurance endeavors related to time-out procedures, ancillary testing including HPV testing, and cervical cancer preventative health.

Resident Evaluation

Evaluation tools include: 360 degree (faculty, non-physician and student evaluations), checklist / specific skills evaluations, checklist / self evaluation, portfolio tracking via SATs*, case log entries and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation. In addition, residents will be given MCQ examination on slide material including gyn, non-gyn and FNA cases.

Milestones:

see specific Cytopathology PC7 and PC8 below. See AP/CP and AP milestones pp. 93-96.

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Daily duty hours are Mon-Friday, 7:30 am – 4:30 pm

Additional Conferences: every other Tuesday 1200pm gyn pathology conference and bimonthly QA/QC conference

Resident Supervision: pp. 14**Suggested Reading:**

Atkinson B, Atlas of Diagnostic Cytopathology, WB Saunders, Philadelphia, 2nd Ed, 2003.

DeMay RM, The Art & Science of Cytopathology, ASCP Press, Chicago, 1996.

DeMay RM, Practical Principles of Cytopathology, ASCP Press, Chicago, 1999.

Notes:

PC7: Procedure: Performing fine needle aspiration biopsies: Demonstrates attitudes, knowledge and practices that enables proficient history taking, physical examination, fine needle aspiration (analysis and appraisal of findings, synthesize and assemble and reporting) (AP)

Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Recognizes the role of fine needle aspiration biopsies (FNAB)	<p>Participates in simulated experience in fine needle aspiration, including slide preparation and staining; observes and assists on FNAB</p> <p>Observes or participates in providing support to other service providers performing FNAB</p> <p>Is aware of potential complications of the FNAB and need to obtain informed consent</p>	<p>Performs a "time-out" according to standard procedures; performs FNAB; procures adequate specimens</p> <p>Provides an accurate adequacy assessment and triages specimens for appropriate ancillary studies</p> <p>Obtains informed consent; Recognizes and understands the management of complications of FNAB</p>	<p>Understands indications for and/or performs ultrasound guided FNAB and core needle biopsy</p> <p>Provides appropriate provisional assessment</p> <p>Manages complications of the FNAB or refers to appropriate healthcare professional</p>	Proficient in the performance of FNAB

PC8: Other Procedures: If training program teaches other procedures (e.g., bone marrow aspiration, apheresis, ultrasound guided FNA, etc.) (AP/CP)

Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Understands procedure and the resultant specimens and potential complications	Is aware of indications and contraindications for procedure and follows protocols and regulations	Discusses with pathology attending staff any requests that are contraindicated, obtains informed consent, and is able to assess specimen and procedure adequacy	Appropriately and professionally documents procedure and discusses with clinical team and manages complications	Proficient in the performance of the procedure

ELECTRON MICROSCOPY

Location: Children's Hospital of New Orleans

Length: 0.5month, often in combination with clinical pathology topic

Director: Randall Craver, MD (CHNOLA)

Skill Level differentiation: N/A. One month rotation requirement

Goals and Objectives:

Demonstrate knowledge of:

- the electron microscope
- the procedures for submitting specimens and tissue preparation
- common ultrastructural features in disease that routinely require electron microscopy (EM)
- interpretation of high resolution light microscopy slides (HRLM)
- interpretation of fluorescence microscopy (FL)
- interpretation of kidney biopsies
- Ability to photograph and interpret all concurrent cases for HRLM, FM, EM and correlate cases with light microscopy
- Learn and construct correct format of a final EM report including written EM reports that include TEM, FM, HRLM aspects

-1 Case/day [total 20 cases/month] should be selected from case files to include into the EM study file in the following format:

- o Case history
- o One MCQ
- o Diagnosis
- o Major Features

-Presentation in PowerPoint format is expected at the conclusion of the rotation. Topic is to be discussed with Director.

Patient Care:

Residents gather relevant clinical information from on-line patient data systems and/or patient charts as well as discussion with clinicians. Review previous diagnostic pathologic material. Prepare and interpret EM reports. Preview and render preliminary diagnoses on cases prior to review with faculty.

Medical Knowledge:

Residents will demonstrate knowledge about the technique of EM and its associated testing methods as well as knowledge about diagnostic EM, its uses and applications. Residents will have knowledge of EM tissue preparation. Evidenced by thoroughness of the study case preparation and the powerpoint presentation.

Practice-Based Learning and Improvement:

Residents will demonstrate the ability to analyze their practice experience by systematically evaluating their EM reports for factual and/or typographical errors. Residents must correlate their diagnoses with those rendered by faculty and thus guide their learning to improve diagnostic capabilities. Residents will investigate complicated cases and incorporate scientific evidence into their practice for the continual improvement of their patient care. 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:

Residents will demonstrate effective, respectful, and professional communication with other health care professionals and faculty throughout the day as well as at weekly pathology case conferences and end-of-month presentation.

Professionalism:

Residents must demonstrate respect, integrity, compassion, sensitivity to diverse patient populations, a commitment to medical ethics and professional responsibilities, and a responsiveness to patient's needs that supercedes their own self interest. This may be evidenced by timely response and completion of EM case work and study set material and demeanor throughout the rotational experience. Residents must also exhibit appropriate behavior with peers, clinicians, faculty, and technical, clerical and administrative faculty. This is evaluated by close personal observation of pathology faculty and faculty in their daily interactions with residents.

Systems-Based Practice:

Residents will demonstrate an awareness of and responsiveness to the health care system context in which the EM service must function. This includes an understanding of how the diagnoses they render affect health care decisions for patients and the health care system. Residents must understand the importance of rational use of specialized tests (e.g. immunofluorescence etc.) in order to provide cost-effective care without compromising quality. Residents must understand the importance of quality assurance and control as they relate to improving functions within the laboratory as well as the laboratory's interactions with the larger health care system.

Resident Evaluation

Evaluation tools include: 360 degree (faculty, non-physician), checklist / self evaluation, portfolio tracking via SATs, and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Evaluations also based on presentation of cases at Monday morning conference, end of month Thursday Pathology Conference and quality of case study preparation

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Additional Conferences:

Monday morning surgical pathology conferences: TBA at CHNOLA

Thursday: 0800 Pathology conferences (CHNOLA)

Daily duty hours are Mon-Friday, 7:00 am – 5:00 pm

Milestones: see general AP/CP and AP milestones below pp. 93-96

Suggested Reading:

Handbook of Diagnostic Electron Microscopy for Pathologist-in-Training. Irving Dardick.

Flow Cytometry (+/- hematology and/or microscopy)

Location: ILH
CHNOLA – see appendix for more information pg. 98-99

Length: minimum one month

Directors: Rachna Jetly, MD (ILH)
Matt Stark, MD (CHNOLA)

Additional Supervising Faculty: A. Duong, MD (ILH)
R. Craver, MD (CHNOLA)
L. Leiva, PhD (CHNOLA)

Goals and Objectives: Skill Level I

- Understand clinical indications for flow cytometric evaluation of blood, marrow, solid tissue, or fluid cells.
- Understand the technology used with a flow cytometer.
- Understand QC procedures unique to flow cytometry assays (e.g., nature of controls and accounting for all lymphocyte subsets in a blood sample).
- Understand the principles of routine flow cytometry evaluation of leukocytes, including both surface and intracellular markers, and recognition of clonal abnormalities.
- Understand principles of tests designed to evaluate DNA content (ploidy) and cell cycle, as used in the evaluation of products of conception and other tissues.
- Understand platelet antibody testing by flow cytometry and its clinical applications.
- Understand the diagnostic and prognostic information provided by flow cytometry.
- Understand the principles of lymphocyte subset analysis:
know the commonly used antigens to define T-cell subsets, natural killer, and B cells.
- Appreciate the effect of age on lymphocyte subset normal ranges.
- Observe/perform lymphoma/leukemia panel on blood and/or bone marrow.
- Observe/perform lymphoma panel on lymph node or spleen specimens.

Skill Level II

- Evaluate and interpret results of flow cytometry in conjunction with cytochemistry, immunocytochemistry, immunohistochemistry studies, and lymph node pathology as related to hematopoietic and lymphoproliferative diseases
- Understand the characteristic clinical, morphologic, immunophenotypic, cytochemical, and cytogenetic/molecular features of leukemias, lymphomas-lymphoblastic, anaplastic, Burkitts, immune deficiencies, stem cell collections, DNA indices, respiratory burst, myelodysplastic syndromes, paroxysmal nocturnal hemoglobinemia, multiple myeloma, monoclonal gammopathy of undetermined significance, neuroblastoma, chronic lymphoproliferative disorders, lymphomatoid granulomatosis, posttransplant lymphoproliferative disorder, polymorphic and lymphomatoid papulosis, and histiocytic disorders.
- Interpret CD34 counts for stem cell transplantation and for prognostication in myeloproliferative disorders.
- Understand the principles and interpretation of reticulated platelet analysis.
- Understand the principles of, and interpret analyses for, minimal residual disease.

Patient Care:

Residents gather relevant clinical information from on-line patient data systems and/or patient charts

as well as discussion with clinicians. Interpret flow cytometry panels with knowledge about clinical diagnoses that correlate to flow results.

Medical Knowledge:

Residents will demonstrate knowledge about flow cytometry including independent study of provided didactic presentations. Residents will learn to apply techniques to clinical indicators for flow cytometry.

Practice-Based Learning and Improvement:

Residents will demonstrate the ability to analyze their practice experience by systematically evaluating their interpretive algorithm. Independent use of teaching cases and case file material. Residents must correlate their diagnoses with those rendered by faculty and thus guide their learning to improve diagnostic capabilities. Residents will investigate complicated cases, assess their diagnostic and consultative service, and incorporate scientific evidence into their practice for the continual improvement of their patient care.

Interpersonal Communication Skills:

Residents will demonstrate effective, respectful, and professional communication with patients, health care professionals, and other physicians. Residents, when applicable, will present at interdisciplinary conferences.

Professionalism:

Residents must demonstrate respect, integrity, compassion, sensitivity to diverse patient populations, a commitment to medical ethics and professional responsibilities, and a responsiveness to patient's needs that supercedes their own self interest. Residents must also exhibit appropriate behavior with peers, clinicians, faculty, and technical, clerical and administrative faculty. This is evaluated by close personal observation of faculty and by various evaluation instruments.

Systems-Based Practice:

Residents will demonstrate an awareness of and responsiveness to the health care system context in which flow cytometry operates. This includes an understanding of how the diagnoses they render affect health care decisions for patients and the health care system. Residents must understand the importance of rational use of flow in order to provide cost-effective care without compromising quality. Residents must understand the importance of quality assurance and participate in performance improvement committee activities as they relate to improving functions within the laboratory as well as the laboratory's interactions with the larger health care system.

Resident Evaluation:

Evaluation tools include: 360 degree (faculty, non-physician), checklist / self evaluation, portfolio tracking via SATs, and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones: see AP/CP and CP milestones pp.93-95 and 97

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Daily duty hours are Mon-Friday, 7:00 am – 5:00 pm

Suggested Reading:

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

Notes:

FORENSIC PATHOLOGY / TOXICOLOGY

Location: Jefferson Parish Coroner's Office (JPCO)

Length: One month minimum

Director: Susan Garcia, MD (Forensics, JPCO)

Additional Faculty:

Avery Ragan, PhD (Toxicology, LH)
Dana Troxclair, MD (Forensics, JPCO)
Mariana Sandormirsky (Forensics, JPCO)

Goals and Objectives:

The forensic pathology rotation may be scheduled anytime after at least three months of autopsy experience has been completed. During this rotation the pathology resident participates in the daily functions of the Jefferson Parish Coroner's Office. The residents are under the immediate supervision of the pathologist on duty at the Coroner's Office. Due to legal requirements the pathology resident will not be given primary responsibility on autopsies and will be directly supervised at all points during the rotational experience.

Skill Level differentiation: N/A. One month rotation requirement

Forensic Pathology

Goals and objectives include attainment of knowledge in:

- the types of cases subject to the Coroner's jurisdiction.
- the indications and techniques of death scene investigation.
- the criteria for autopsy versus external examination only.
- the differences in technique as opposed to hospital autopsies including evaluation of common injury patterns including gunshot wounds;
- death classification terminology such as cause, manner, and mechanism of death.
- the "chain of custody."
- the role of the forensic pathologist and the forensic autopsy in courtroom testimony and depositions.

Toxicology

Goals and objectives include attainment of knowledge in:

1. PHARMACOKINETICS

- the concepts of drug absorption, bioavailability, volume of distribution, and distribution phases (multicompartment models) and prediction of peak drug levels.
- the differences between first- and zero order kinetics of drug metabolism/elimination.
- the concepts of drug clearance, half-life, and the exponential rate constant including the calculation of steady-state drug levels and peak and trough drug levels throughout a dosing cycle.
- the origin and consequences of nonlinear or zero-order pharmacokinetics on drug pharmacokinetics.
- the differences between measurement of total, free, and protein-bound drug levels and be able to assess the consequences of altered protein binding on pharmacokinetics and therapeutic drug monitoring.

2. DRUG METABOLISM

- the differences between phase I and phase II drug metabolism reactions.

- the various consequences of competing metabolic pathways to modulate both the efficacy and toxicity of administered medications.
- the frequent inter-individual variability of drug-metabolizing enzymes and its impact on the variability of drug response.

3. PHARMACODYNAMICS

- the general mechanisms of drug action, including drug–receptor interactions, modulation of metabolic pathways, and nucleic acid biochemistry.
- the use of reference ranges for therapeutic drug monitoring including trough, peak, or steady-state drug levels for monitoring both drug efficacy and toxicity, and the therapeutic index.

5. TOXICOLOGIC SYNDROMES

- the pathophysiological basis of the five major toxicologic syndromes (cholinergic, anticholinergic, sympathomimetic, opiate, and sedative-hypnotic).
- the toxicologic differential diagnosis and their individual clinical laboratory testing protocol
- the basic therapeutic approach to each syndrome.

6. LABORATORY EVALUATION AND MANAGEMENT OF OVERDOSED

- the National Academy of Clinical Biochemistry guidelines for Emergency Toxicology.
- the important differences between urine and blood for monitoring and detection of drugs/xenobiotics.
- the design of STAT panels of laboratory tests for evaluation of overdosed/poisoned patients.
- the limitations of drug “screening” protocols
- the toxicologic profiles of specific agents, including acetaminophen, salicylates, alcohols and glycols, barbiturates, tricyclic antidepressants, carbon monoxide, organophosphates and carbamate, digoxin, lead, iron, and cyanide.
- the general supportive measures in clinical medicine

7. LABORATORY EVALUATION OF DRUGS OF ABUSE

- the generic methodology of the routine immunoassays for drugs-of-abuse testing.
- the major drugs of abuse and their clinical manifestations.
- the common methods for adulteration of urine and the techniques in the laboratory to detect them.
- the specific reactivities of each immunoassay, the standard cutoffs for detection, and whether the assay is capable of detecting the parent drug, its metabolites, or both. Know which members of a drug class are poorly or well detected by a generic immunoassay (e.g., oxycodone detection by the opiate immunoassay) and know the common causes of false positives due to cross-reactivities.

Patient Care:

The pathologist acts as a consults to law enforcement personnel and other interested parties and must demonstrate a satisfactory level of competency in regards to performance of forensic/medical legal autopsies and determination of cause, manner, and mechanism of death. Must incorporate overlying reason for case to be brought in under coroner jurisdiction. For toxicology, additional competence in toxicology pathology as applied to clinical medicine in the above noted goals and objectives should be sought.

Medical Knowledge:

Residents must demonstrate an investigative and analytical approach to development answers to basic forensic determinations, e.g. time of death, identification of decedent, mechanisms of injury, etc. Exhibit effective use of ancillary studies, e.g. toxicology, when pertinent. For toxicology, additional competence in toxicology pathology as applied to clinical medicine in the above noted goals and objectives should be sought.

Practiced Based Learning and Improvement:

Residents will demonstrate the capability to investigate complicated cases, assimilate scientific evidence; including data from relevant scientific studies assess diagnostic and consultative practices.

Evaluate reports for diagnostic and typographical errors and assess slides for suboptimal preparation. Residents will display an ability to accept constructive feedback for continual performance improvement.

Interpersonal and Communication Skills:

Residents demonstrate effective communication with law enforcement and other individuals involved in the legal system. Interact appropriately with families when requested. Residents will maintain efficient and articulate communications with faculty physicians and supervising faculty as well as medical technologists involved in the toxicology laboratory.

Professionalism:

Residents must demonstrate appropriate behavior with peers, personnel of the coroner's office, legal and law enforcement personnel. Display respect, compassion, and integrity in interactions with all the aforementioned as well as victim's families as required. Exhibit commitment to ethical principles in providing forensic services including patient confidentiality. For toxicology, additional competence in toxicology pathology as applied to clinical medicine in the above noted goals and objectives should be sought.

System Based Practice:

Residents must appreciate the effect of their diagnostic findings and determinations on the patients, families, and legal system. Assess the differences (e.g. gross only versus complete autopsy) in regards to cost and information necessary to the legal system. For toxicology, additional competence in toxicology pathology as applied to clinical medicine in the above noted goals and objectives should be sought.

Resident Evaluation

Evaluation tools include: 360 degree (faculty and non-physician), checklist / self evaluation, portfolio tracking via SATs, case log entries and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Daily duty hours are Mon-Friday, 7:30 am – 4:30 pm which should include one ½ day per week in JPCO Toxicology Laboratory and one ½ day per week at MCL with Dr. Ragan.

While at JPCO, the duties and expectation for that day should be clarified with the appropriate faculty or section director upon arrival in the appropriate laboratory. Whenever possible, residents should observe testimony of forensic pathologist.

Milestones: see Autopsy milestone above pp. 26; AP/CP and AP milestones pp. 93-96.

Suggested Reading:

Forensics: Spitz W (Ed), Spitz and Fisher's Medicolegal Investigation Of Death: Guidelines For The Application Of Pathology To Crime Investigation,

Toxicology: Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

HEMATOLOGY

Location: ILH
West Jefferson Medical Center (WJMC)
Children's Hospital (CHNOLA) – see Appendix for more information pp. 98-99

Length: Minimum four months (+/- flow cytometry and/or medical microscopy)

Directors: Rachna Jetly, MD (ILH)
Matt Stark, MD (CHNOLA)

Additional Faculty: A. Duong, MD (ILH)
B. Farris, MD (WJMC)
Randall Craver, MD (CHNOLA)

Goals and Objectives:

Skill level I is applicable to initial two rotations while skill level II is applicable to final rotations.

I. HEMATOLOGY

1. AUTOMATED HEMATOLOGY

Skill Level I

- Understand clinical indications for peripheral blood cell enumeration and differential analysis.
- Know the components of a complete blood count and understand the information provided by each.
- Understand the principles of automated cell counting, including red blood cell (RBC) indices and their derivation.
- Understand how “absolute values” are determined and how they differ from “relative percent”.
- Identify spurious white blood cell (WBC), RBC, hemoglobin, and platelet determinations and be able to propose a course of action to be followed for reporting results.
- Understand appropriate WBC correction for the presence of nucleated RBCs.
- Understand automated differential analysis and manual review criteria.
- Understand the absolute neutrophil count and its clinical utility, as well as problems associated with band counts.
- Understand QC procedures specific to cell counters, such as Rumke limits on differential cell counts and Bull analysis of indices.
- Understand principles of automated and manual reticulocyte enumeration and their respective technical limitations.

Skill Level II

- Interpret results of automated and manual cell counts and understand the relevant technical limitations.
- Recommend appropriate steps for abnormal sample processing, analysis, and result reporting.
- Review abnormal results and correlate results with peripheral blood smear findings and clinical history.

2. PERIPHERAL BLOOD SMEAR ANALYSIS

Skill Level I

- Know proper preparation and handling of peripheral blood smears, including standard stains and special stains used to identify cellular structures and inclusions.

- Understand normal RBC, WBC, and platelet morphology.
- Be able to estimate WBC and platelet counts.

Skill Level II

- Recognize abnormal RBC, WBC, and platelet morphology; formulate a differential diagnosis; and suggest appropriate laboratory testing for follow-up.
- Recognize technical artifacts in WBC, RBC, and platelet morphology.
- Recognize infectious disorders that can be diagnosed by blood smear.
- Recognize storage disorders and congenital disorders that have morphologic manifestations in the peripheral blood smear.
- Correlate peripheral blood smear findings with bone marrow morphology.

3. MANUAL HEMATOLOGY METHODS

Skill Level I

- Understand principles of microhematocrit determination and its technical limitations.
- Understand the principles of erythrocyte sedimentation rate.
- Understand the principle and utility of supravital stains, including reticulocyte stain, hemoglobin H preparation, and Heinz body preparation.

II. Special Laboratory Tests in Hematology

1. WBC DISORDERS

See Section IV (*Flow Cytometry*) and Section V (*Hematopathology*) below.

2. RBC DISORDERS

Skill Level I

- Learn the clinical indications for laboratory tests involved in the assessment of intrinsic and extrinsic RBC defects/disorders.
- Know the pathophysiology and characteristic laboratory findings of the major disorders causing normocytic, microcytic, and macrocytic anemia.
- Describe iron metabolism and laboratory tests for iron depletion.
- Understand hemoglobin synthesis and degradation.
- Understand the principles of hemoglobin screening by HPLC and electrophoresis at acid and alkaline pH.
- Understand the principle and clinical utility of screening tests for the presence of hemoglobin S.
- Know the pathophysiology and laboratory features of intravascular and extravascular hemolysis.
- Understand the principle and clinical utility of Kleihauer–Betke and/or flow cytometric analysis for fetal hemoglobin.

Skill Level II

- Interpret hemoglobin electrophoretic patterns and ancillary tests for the diagnosis of
 - _ Major hemoglobinopathies;
 - _ Disorders related to enzyme defects;
 - _ Hereditary spherocytosis and other RBC membrane/cytoskeletal defects;
 - _ Paroxysmal nocturnal hemoglobinuria;
 - _ Hemolytic anemia;
 - _ Congenital dyserythropoietic anemias.

3. PLATELET DISORDERS

Skill Level I

- Understand the pathophysiology of thrombocytopenia and thrombocytosis:
 - Differentiate between reactive and malignant processes;

--Understand the pathophysiology of immune thrombocytopenia and thrombotic thrombocytopenic purpura.

- Demonstrate competency in taking a bleeding history.
- Understand the clinical utility of platelet function testing.
- Understand general principles of platelet function testing.
- Understand the pathophysiology of acquired and congenital platelet function disorders.
- Understand the pathophysiology leading to major von Willebrand disease subtypes and expected laboratory results.
- Recognize acquired platelet function abnormalities associated with antiplatelet therapy.

Skill Level II

- Interpret platelet function studies, including screening tests, platelet aggregation, and platelet secretion studies.
- Interpret studies performed for the evaluation of von Willebrand disease.

III. Hematopathology

1. BONE MARROW:

Skill Level I

- Understand the clinical indications for bone marrow evaluation.
- Understand the diagnostic limitations of bone marrow aspirate and biopsy sections.
- Learn technical aspects of performing and analyzing bone marrow aspiration and biopsy. Encourage performance of bone marrow aspiration and biopsy.
- Identify sites for the acquisition of bone marrow in children and adults.
- Learn handling, preparation and interpretation of bone marrow specimens, including special stains (e.g., silver stain and Prussian blue).
- Correctly assess bone marrow cellularity and M-E ratio.
- Recognize effects of chemotherapy and growth factor stimulation on blood and bone marrow.
- Understand common drug effects leading to benign cytopenias.
- Correctly identify storage iron and assess adequacy.
- Understand hematopoiesis and distinguish the stages for cells in each hematopoietic cell series.
- Know the major hematopoietic regulatory factors/cytokines.
- Recognize normal WBC, RBC, and platelet maturation as well as cellular dysplasia.
- Understand diagnostic principles involved in distinguishing transient myeloproliferative syndromes (such as associated with Down syndrome), transient cytopenias, and transient lymphocytoses from clonal disorders.

Skill Level II

- Understand the pathophysiology, clinical findings, etiology, and expected bone marrow morphology for vitamin deficiency anemias, hemoglobinopathies, thalassemias, aplastic anemia, red cell aplasia, leukemias, myeloproliferative disorders, myelodysplastic syndromes, plasma cell dyscrasias, and mast cell diseases.
- Integrate morphology, cytochemistry, immunophenotype, and molecular and cytogenetics in the differential diagnosis of acute and chronic leukemia, lymphoma, and myeloproliferative and myelodysplastic diseases.
- Integrate peripheral blood smear and bone marrow findings and render a preliminary diagnosis.
- Know the post-therapy findings seen after treatment for leukemia and the temporal relationships to marrow regeneration post therapy.
- Recognize the bone marrow manifestations of infections (e.g., viral, fungal, and hemophagocytic syndromes).
- Recognize the bone marrow manifestations of noninfectious systemic diseases (e.g., alcoholism, collagen vascular disease, and nonhematologic malignancies).

Patient Care

- Appreciate special considerations in pediatric hematology/coagulation and hematopathology.
- Understand the different types of hematopoietic stem cell transplants.
- Understand procedural aspects of bone marrow aspiration and biopsy.

ALL Bone marrow aspirates/biopsies must be entered into the ACGME Case Log system and will be reviewed at least annually.

Medical Knowledge:

Residents must demonstrate an analytical approach to

Practiced Based Learning and Improvement:

Residents will demonstrate the capability to assess the literature for data from relevant scientific studies. They will be able to assess diagnostic and consultative practices. They should strive for reporting that shows consistency in diagnostic practice. Residents will display an ability to accept constructive feedback for continual performance improvement.

Interpersonal and Communication Skills:

Residents demonstrate effective communication with patients and with the clinical team. The end of rotation presentation should be delivered effectively. Direct communication with supervising faculty is encouraged.

Professionalism:

Residents must demonstrate appropriate behavior with patients and all health care professionals. A good positive working relationship with laboratory personnel should be fostered.

System Based Practice:

Resident Evaluation

Evaluation tools include: 360 degree* (faculty and non-physician), checklist / self evaluation*, checklist/ specific skills, portfolio tracking via SATs*, case log entries* and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Residents will be expected to present a topic (to be approved by the faculty) during the resident morning didactic series at the end of each month.

Milestones:

see bone marrow specific milestone below PC8; AP/CP and CP milestones pp. 93-95 and 97

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Supervision: pp. 14

Suggested Reading

Foucar K. Bone Marrow Pathology, 2nd ed. Chicago, IL: American Society of Clinical Pathology, 2001.

Jaffee ES, Harris NL, Stein H, Vardiman JW, eds. World Health Organization Classification of Tumors. Pathogenesis and Genetics of Tumors of Hematopoietic and Lymphoid Tissues. Lyon, France: IARC Press, 2001.

Keren DF, McCoy JP, Carey JL, eds. Flow Cytometry in Clinical Diagnosis, 3rd ed. Chicago, IL: American Society of Clinical Pathology, 2001.

Hoyer JD, Kroft SH, eds. Color Atlas of Hemoglobin Disorders: A Compendium Based on Proficiency Testing. Chicago, IL: American Society of Clinical Pathology, 2003.

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

Notes:

PC8: Other Procedures: If training program teaches other procedures (e.g., bone marrow aspiration, apheresis, ultrasound guided FNA, etc.) (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Understands procedure and the resultant specimens and potential complications	Is aware of indications and contraindications for procedure and follows protocols and regulations	Discusses with pathology attending staff any requests that are contraindicated, obtains informed consent, and is able to assess specimen and procedure adequacy	Appropriately and professionally documents procedure and discusses with clinical team and manages complications	Proficient in the performance of the procedure

LAB MANAGEMENT / INFORMATICS

Location: VA Hospital

Length: minimum 1 month

Director: Fred Rodriguez, MD

Skill Level differentiation: N/A. One month rotation requirement

Goals and Objectives:

Education in laboratory management and informatics occurs throughout each laboratory section in each location. Residents take part in daily functions and operations of all the laboratories in both anatomic and clinical pathology. They are exposed to general methods and techniques of management and information technology as they participate in activities personnel and financial management, quality assurance and control, regulatory and accreditation issues, as well as they daily flow of information into and out of the laboratory and the proper utilization of that information. Within each laboratory they are also become involved in management and informatics issues unique to the laboratory section, e.g. unique features of the laboratory information system as it relates to the blood bank. While participating in preparation for inspection, e.g. JCAHO, CAP, etc. or while acting as inspectors for CAP at other institutions, residents become aware of and knowledgeable of various regulatory issues. In addition to these experiential activities, there are didactic conferences covering topics in these areas.

I. Organizational and Leadership Skills

- Understand the fundamental principles of human behavior in organizations, of management structure and function, and of organizational structures. Compare and contrast the structure of differing practice settings (e.g., hospital-based, specialty practice, independent laboratory, etc.).
- Develop the interpersonal skills required to effectively manage, lead, and motivate others, including professional peers.
- Develop an understanding of the role of ethics in medical and managerial decision-making.
- Appreciate the conflicting responsibilities and rewards of pathologists, administrators, and technologists, and even the competing interests within each group as necessary to the positive functioning of the laboratory.
- Understand the nature of the relationships between pathologists, hospitals, and medical faculty, including a basic understanding of contracts, decision-making, and effective negotiation.
- Develop skills to project an environment of patient oriented and ethical service.
- Understand the organization of the laboratory, including preanalytical sample acquisition, accessioning and processing, structure of analytical units, and postanalytical sample resulting. Recognize the different skill sets required of personnel in all of these areas. Be able to analyze work flow in the laboratory.
- Understand human resource systems, including effective processes for recruitment, retention, and performance management of technical and professional faculty.

II. Financial Skills

- Understand the fundamentals of financial data collection and financial statement presentation and analysis.
- Understand the role of the budget process for operational planning, managing, and control.
- Understand how to properly assign Current Procedural Terminology (CPT) codes to procedures in the laboratory.

- Understand how to assess the need for new instrumentation as well as the process of financial justification of capital equipment investments such as these.
- Understand the nature and behavior of costs in the laboratory, including test-cost accounting.
- Understand the applicable forms and requirements of reimbursement, particularly Medicare reimbursement, for both clinical laboratories and pathologists.
- Understand how to monitor utilization and become familiar with strategies to effectively manage utilization in a healthcare organization.

III. Regulatory Skills

- Become familiar with the accrediting agencies relevant to laboratory certification and licensure [e.g., CAP, AABB, Occupational Health and Safety Administration, CMS, Clinical Laboratory Improvement Amendments (CLIA), and JCAHO], and participate in at least one CAP “mock” or “self-inspection” of the laboratory.
- Become familiar with the “test complexity” models under CLIA for clinical laboratory tests (i.e., high complexity, moderate complexity, waived, and physician performed microscopy).
- Understand the regulatory and compliance environment for laboratories, including CLIA and the Office of the Inspector General model compliance plan, and the implications that these have for the laboratory management team.
- Become familiar with the patient privacy and data security requirements of the HIPAA, including the use of institutional review board (IRB) protocols for conducting clinical research.
- Understand training, certification, licensing, and competency assessment standards for laboratory professionals, including medical technologists and medical laboratory technicians.
- Understand the importance of a comprehensive laboratory safety policy and program.
- Understand how Standard Operating Procedures (SOPs) are used in the routine operation of clinical laboratories.
- Understand how SOPs are developed, authored, and reviewed and their importance in mandatory laboratory inspection by various accrediting agencies (e.g., CAP, JCAHO, and AABB).
- Understand the role of risk management in the laboratory and become familiar with the nature of medical malpractice, patient safety initiatives, institutional risk mitigation, and forensic testing.
- Become familiar with the process of long-range planning and strategic management, and the implications that this process has for successful management.
- Become familiar with the fundamental principles of marketing, sales, and a market-oriented service delivery strategy.
- Become familiar with the process for creating and/or critically reviewing a business plan for a new or proposed service.
- Become familiar with the different forms that practice relationships can take (e.g., sole proprietorship, partnership, and corporation), and the advantages and disadvantages of each.
- Participate in the development and authorship, and/or review and revision of SOPs.

IV. Quality Assurance, Quality Control, Pre- and Postanalytic Management

- Understand the role of quality assurance, quality management, and process improvement principles in laboratory operation and planning.
- Understand the role of interlaboratory proficiency surveys, such as the CAP proficiency surveys.
- Be able to develop templates for introduction of new analyte testing in the clinical laboratory, with defined responsibilities at each level of personnel functions.
- Know fundamental statistical concepts for laboratory diagnostics, including descriptive methods, inference regarding population means, confidence intervals, parametric and nonparametric statistics, measures of variance and error, sources of analytical error, methodologic bias, ROC curves, Bayes

theorem, reportable range, analytical range, and linearity. Utilize these methodologies to select and validate new diagnostic tests and analytical methods.

- Understand principles of specimen collection (e.g., phlebotomy technique, safety, and specimen tubes) and specimen processing.
- Recognize sources of preanalytical variation and the role of biological variability in laboratory assessment.
- Know how to employ appropriate use of delta checks in detecting preanalytical, analytical, and postanalytical errors.
- Understand the principles of postanalytical result processing and data delivery (see also the *Informatics* section).
- Understand the principles involved in determination of reference ranges and the limitations of reference range determinations.
- Understand how to choose, use, and monitor the performance of reference laboratories.

III. Informatics

- Understand terms and concepts related to computer hardware and software.
- Understand basic computer networking concepts.
- Understand how to use word processing, spreadsheet, presentation graphics, and statistical software.
- Understand the major features of a laboratory information system.
- Know the basic data elements of a laboratory information system.
- Demonstrate an awareness of the enterprise information system architecture and how the laboratory information system fits within it.
- Be able to extract data from the laboratory information system.
- Understand HIPAA guidelines for security and privacy of protected health information.
- Know internet-related terms and concepts.
- Be able to utilize the internet to
 - Access internet-based databases;
 - Perform literature searches.
- Develop basic understanding of how the laboratory information system shares data with other networked systems within the enterprise.
- Develop basic understanding of laboratory instrument interfaces.
- Understand data standards and encoding schemes, such as Health Level Seven (HL7), Logical Observation Identifier Names and Codes (LOINC), Systematized Nomenclature of Medicine by the CAP (SNOMED), International Classification of Diseases (ICD-9 and ICD-10), and CPT.
- Develop a basic understanding of telepathology systems and concepts.
- Develop a basic understanding of bioinformatics concepts with an emphasis on the critical evaluation of evolving bioinformatics tools. Develop a basic understanding of evolving multiparameter diagnostic approaches.

Medical Knowledge

- Understand the most common forms of clinical laboratory organizational structure.
- Understand management theory and the difference between leadership and management.
- Understand the general elements of an income statement and balance sheet.
- Understand the basic approach to creating a budget for the clinical laboratory.
- Be able to assign correct CPT codes for common pathology and laboratory medicine procedures.
- Understand the basic elements of the laboratory safety program.
- Understand the essential elements of choosing a reference laboratory.
- Understand the necessary elements of test cost accounting in the laboratory and be able to cost account a common laboratory procedure.

- Understand how to perform a new instrument evaluation and prepare a financial justification analysis.
- Be able to conduct a performance appraisal.
- Understand the necessary elements of a risk management program and be able to describe how to effectively manage an incident.
- Be able to conduct a management meeting within the laboratory.
- Know how to review external proficiency surveys and respond to identified problems or questions.
- Be able to design a program for test evaluation and validation.
- Be able to participate in a quality process improvement project.
- Understand how to seek and obtain IRB approval for clinical research studies.

Practice-Based Learning and Improvement

- Be able to perform a CAP self-inspection or mock inspection.
- Understand the basic elements of the model compliance plan for laboratories.
- Understand the basic elements of the strategic planning process.
- Be able to participate in a quality process improvement process.

Interpersonal and Communication Skills

- Understand how to conduct an interview for a new employee.
- Present and articulate the QI project in an effective and clear manner

Systems-Based Practice

- Understand the differences between different forms of professional practice.
- Understand the essential elements of professional employment and practice group contracts.
- Understand how to develop a business plan, together with a marketing and sales plan for hospital laboratory outreach program.

Resident Evaluation

Evaluation tools include: 360 degree (faculty and non-physician), checklist / self evaluation, checklist/specific skills, portfolio tracking via SATs and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Residents are expected to participate in a quality improvement project during the course of the month and present the project to the residency program in a morning didactic session.

Milestones:

see AP/CP milestones pp.93-95 and Lab Management/Informatics milestones below

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences and participation in any additional QC/QA and/or CAP inspection committee meetings

Daily duty hours are 7:30 am – 4:30 pm

SBP3: Lab Management: Resource Utilization (Personnel and finance): Explains, recognizes, summarizes and is able to apply resource utilization (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Interprets an organizational chart and is aware of employment contracts and benefits</p> <p>Describes a budget</p>	<p>Knows the personnel and lines of reporting in the laboratory</p> <p>Recognizes different budget types (i.e., capital vs. operating budget)</p>	<p>Understands and describes the process of personnel management and employment laws (e.g., interview questions, Family and Medical Leave Act, termination policies)</p> <p>Understands key elements of hospital and laboratory budgets</p>	<p>Creates a basic job description and participates in employee interviews/performance evaluation (real or simulated experiences)</p> <p>Participates in a budget cycle exercise (Draft, defend, and propose logical cuts and/or additions)</p>	<p>Manages personnel effectively</p> <p>Develops and manages a laboratory budget</p>

SBP4: Lab Management: Quality, risk management and laboratory safety: Explains, recognizes, summarizes and is able to apply quality improvement, risk management and safety issues (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Demonstrates working knowledge of basic statistical analysis</p> <p>Participates in basic safety training (e.g., OSHA, blood borne pathogen, personal protective equipment)</p>	<p>Participates in laboratory specific safety training (e.g., sharps disposal, proper equipment utilization)</p> <p>Understands when and how to file an incident or safety report</p> <p>Understands the concept of a laboratory quality management plan</p>	<p>Interprets quality data and charts and trends; understands continuous improvement tools, such as Lean and Six Sigma</p> <p>Understands serious reportable events (SREs) and appropriate reporting, and participates in root cause analysis (RCA)</p> <p>Demonstrates a knowledge of proficiency testing and its consequences</p> <p>Attends and participates in quality improvement meetings</p>	<p>Has completed a quality improvement project</p> <p>Reviews and analyzes proficiency testing results</p> <p>Participates in department and hospital wide quality, risk management, and safety initiatives</p>	<p>Utilizes continuous improvement tools, such as Lean and Six Sigma</p> <p>Manages laboratory quality assurance and safety</p>

SBP5: Lab Management: Test Utilization: Explains, recognizes, summarizes and is able to apply test utilization (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Is aware of the test menu and rationale for ordering	Organizes basic data for utilization review Identifies key elements of ordering practices Able to understand appropriate ordering or inappropriate ordering and over-utilization	Able to interpret charts and graphs that demonstrate utilization patterns Intervenes in inappropriate or over-utilization situations	Able to create charts and graphs that demonstrate utilization patterns (simulated or real experiences) Maintains a portfolio that includes experience in test utilization reviews and interventions that drive change	Demonstrates a broad portfolio of analyses for utilization reviews in complex scenarios and team management to drive change in areas both within and outside of the department

SBP6: Lab Management: Technology assessment: Explains, recognizes, summarizes and is able to apply technology assessment (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Be familiar with common spreadsheet software	Understands the need for a process in implementing new technology	Understands and describes the process of implementing new technology	Participates in new instrument and test selection, verification, implementation, and validation (including reference range analysis) and maintains a portfolio of participation in these experiences	Acts as primary assessor for new technology and able to lead efforts to optimize test utilization and resource management

SBP7: Informatics: Explains, discusses, classifies and applies clinical informatics (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Be familiar with basic technical concepts of hardware, operating systems, software for general purpose applications	Understands and begins to apply lab specific software, key technical concepts and subsystems on interfaces, workflow, barcode application, automation systems (systems architecture)	Is able to apply informatics skills in project management (data management, computational statistics)	Participates in operational and strategy meetings, apprentice troubleshooting with IT staff, can apply informatics skills in laboratory management and integrative bioinformatics (ability to aggregate multiple data sources and often multiple data analysis services)	Is proficient in Medical Informatics systems, is able to assess and purchase a Laboratory Information System for Anatomic and/or Clinical Pathology laboratories, is able to utilize Medical Informatics in the direction and operation of the laboratory

MICROBIOLOGY

Location: West Jefferson Medical Center (WJMC)

Length: Minimum four months

Director: B. Farris, MD (WJMC)

Additional Faculty: W. Luer, MD
J. Brown, MD

Goals and Objectives:

Skill level I is applicable to initial two rotations while skill level II is applicable to final rotations.

I. General Microbiology

Skill Level I

- Understand dynamics of bacterial growth (log and stationary phase).
- Understand QC testing and proficiency testing needed for optimum identification of infectious agents in clinical specimens.
- Acquire knowledge of safety issues in microbiology/virology, including handling of infectious agents and chemicals, recommended biosafety levels, and disposal of hazardous waste.
- Understand infection control principles and the importance of collaboration between Infection Control and the Microbiology/Virology Laboratory for prevention of nosocomial infections.
- Understand basic public health principles and the vital interaction between diagnostic laboratories and public health agencies.

Skill Level II

- Develop knowledge of the laws and regulations defining select agents and identify resources for information on bioterrorism agents.
- Understand the importance of biofilms in infectious diseases.

II. Bacteriology

Skill Level I

- Describe characteristics of infectious diseases caused by major aerobic and anaerobic bacteria and aerobic actinomycetes, including clinical presentation, transmission, pathophysiology, and epidemiology.
- Understand proper specimen collection, appropriate methods for transportation of specimens, and appropriate plating methods used for optimum detection of bacteria in clinical specimens.
- Demonstrate proficiency in reading and interpreting. Gram stains of organisms from cultures, positive blood culture bottles, and patient specimens (e.g., CSF and urine).
- Describe the basic types of plating media and broths used to isolate bacteria from various clinical specimens, including 5% sheep blood agar, chocolate agar, MacConkey agar, CNA agar, PEA agar, specialized agar for recovery of stool and genital pathogens, BHI broth, and thioglycolate broth.
- Describe factors important for optimum recovery of pathogens from blood cultures, including optimum volume, timing, and number of cultures to collect, and discuss advantages and disadvantages of available blood culture instruments and blood culture media.

- Understand typical Gram stain appearance, colony morphology, and hemolysis patterns for commonly isolated gram-positive (*Staphylococcus*, *Streptococcus*, *Enterococci*) and gram-negative (*Enterobacteriaceae*, *Pseudomonas*, *Hemophilus*, and pathogenic *Neisseria*) pathogens.
- Be able to interpret colony appearance, media reactions, and rapid test results used to classify common gram positive and gram-negative pathogens, and determine clinical significance of organisms isolated from various body sites, i.e., blood, CSF, urine, body fluids, wounds, stool, and respiratory specimens.
- Demonstrate knowledge of methods for culture and identification of anaerobic bacteria, including optimum specimen collection, media used for anaerobic culture, and methods used to generate anaerobic conditions.
- Describe characteristics of bacterial pathogens that could be used as agents of bioterrorism, including *Bacillus anthracis*, *Brucella* spp, and *Francisella tularensis*.
- Understand rapid and other non-culture-based testing methods available for diagnosis of disease due to major bacterial pathogens, including group A streptococci, group B streptococci, methicillin-resistant *Staphylococcus aureus*, *Clostridium difficile*, *Legionella* spp, *Bordetella pertussis*, *H. pylori*, and *Streptococcus pneumoniae*.
- Understand the advantages and disadvantages of molecular assays available for detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in clinical specimens.

Skill Level II

- Know the media used for isolation of less common or fastidious bacteria, including BCYE agar (*Legionella* spp), TCBS agar (*Vibrio* spp), Regan-Lowe agar (*Bordetella pertussis*), CIN agar (*Yersinia* spp), MacConkey Sorbitol agar (*Escherichia coli* 0157).
- Understand the advantages and disadvantages of methods used to identify bacteria, including automated systems and manual methods (including biochemical reactions such as oxidase, catalase, PYR, lactose fermentation, and metabolism of glucose and other carbohydrates).
- Acquire advanced skills in microscopy, including the ability to read and interpret respiratory and wound Gram stains and fluorescent stains.
- Describe the steps necessary for validation of new testing methods in bacteriology.
- Understand the role of QC procedures to ensure optimal performance of microbiological media, reagents, and assay kits.
- Outline process of fluorescent antibody testing for diagnosis of respiratory infections, herpes family infections, Chlamydia and viral culture, CMV
- Discuss testing of specimens for antibiotic associated diarrhea
- Describe process for culture and differentiation of commonly encountered fungi

III. Susceptibility Testing

Skill Level I

- Describe the mechanism of action of the major classes of antimicrobial agents used to treat bacterial, fungal, viral, and parasitic infections.
- Understand basic principles of in vitro susceptibility testing, including achievable serum drug concentrations, minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC), and breakpoints.
- Compare and contrast susceptibility testing methods that may be used in the clinical laboratory, including broth dilution methods, disk diffusion testing, agar dilution testing, and the Etest.
- Understand the Disk Approximation Test used to detect a “D zone” and describe when it should be performed.
- Describe methods used for screening and confirmation of extended-spectrum β -lactamases in gram-negative bacteria.

Skill Level II

- Describe mechanisms and special detection methods for the following phenotypes: vancomycin-resistant enterococci, methicillin-resistant staphylococci, vancomycin-resistant staphylococci, penicillin-resistant *S. pneumoniae*, resistance to extended-spectrum β -lactams in *E. coli* and *Klebsiella* spp, and inducible clindamycin resistance in *Staphylococci* spp.
- Develop the ability to interpret susceptibility testing results using CLSI guidelines.
- Understand the operational and clinical factors involved in selecting particular susceptibility methods for a clinical microbiology laboratory, including facultying levels, routine workflow, and the patient population being tested.

IV. Mycobacteriology

Skill Level I

- Understand the major characteristics of diseases caused by mycobacteria, including clinical presentation, transmission, pathophysiology, epidemiology, infection control issues, and public health concerns.
- Describe decontamination/concentration procedures used to process specimens sent for culture of acid-fast bacilli (AFB).
- Describe the staining methods for AFB, including fluorochrome and carbolfuchsin stains.
- Read and interpret fluorochrome- and carbolfuchsin-stained smears.
- Understand the advantages and disadvantages of liquid and solid media used to culture AFB organisms.
- Define rapid grower, scotochromogen, photochromogen, and nonchromogen and provide examples of mycobacteria in each category.
- Demonstrate knowledge of hybridization probes used for culture identification.
- Understand safety issues associated with culture of AFB organisms.
- Compare and contrast the Mantoux skin test and the Quantiferon test for detection of latent tuberculosis.
- Name the primary antituberculosis agents and the most important drug used in treatment of disease due to *Mycobacterium avium* complex.

Skill Level II

- Compare and contrast the direct nucleic acid amplification methods available for *Mycobacterium tuberculosis* and their role in the diagnosis of tuberculosis.
- Describe susceptibility testing methods used to detect drug resistance in mycobacteria.
- Demonstrate knowledge of reference laboratory methods for mycobacterial identification, including rDNA sequencing and HPLC.
- Describe culture methods for thermosensitive and fastidious *Mycobacterium* spp including *M. marinum*, *M. hemophilum*, and *M. genavense*.

V. Mycology

Skill Level I

- Understand the major characteristics of infectious diseases caused by fungal pathogens, including clinical presentation, transmission, pathophysiology, and epidemiology.
- Describe fungal pathogens that cause disease in specific patient populations, including children, immunocompromised patients, and transplant patients.
- Describe methods for detection of fungal pathogens in clinical specimens, including methods for direct examination of specimens (e.g., KOH smears, vaginal wet preps, and Calcofluor White stain).
- Understand the benefits and limitations of the following nonculture tests for diagnosis of invasive fungal infections: cryptococcal antigen test, urine *Histoplasma* antigen test, *Candida* antigen tests, galactomannan enzyme immunoassay.
- Describe appropriate specimen collection and processing methods for fungal cultures.

- Become familiar with commonly used plating media for fungal cultures, including antimicrobial agents used in primary plates for specimens from nonsterile sites.
- Understand testing algorithms for fungal identification, including colony morphology on standard media, the germ tube test, cornmeal agar, slide cultures, special agars (e.g., CHROMagar Candida media) and biochemical tests.
- Identify *Pneumocystis jiroveci* in respiratory specimens and describe available staining methods for this organism.
- Identify the following fungi based on colony morphology and microscopic appearance: *Aspergillus* spp, *Penicillium* spp, *Histoplasma capsulatum*, *Coccidioides immitis*, *Fusarium* spp, *Penicillium marneffej*, *Pseudallescheria boydii*, and *Zygomycetes*.
- Identify the following fungi based on their appearance in tissue: *C. immitis*, *Blastomyces dermatitidis*, *H. capsulatum*, and *P. jiroveci*.
- List the major classes of antimicrobial agents used to treat fungal infections.

Skill Level II

- Interpret culture results using morphological characteristics of major fungal pathogens and predict clinical significance of an isolate.
- Describe susceptibility testing methods for yeast and fungi and discuss interpretation of susceptibility testing results.
- Name the *Candida* spp that are typically resistant or have reduced susceptibility to azole antifungal agents.

VI. Parasitology

Skill Level I

- Understand the major characteristics of diseases caused by parasites including clinical presentation, transmission, pathophysiology, and epidemiology.
- Describe the life cycles of intestinal, tissue, and blood parasites.
- Describe clinical presentation and the morphological characteristics used to identify *Plasmodium* spp (*P. falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*) and *Babesia* spp.
- Understand proper specimen collection, transportation of specimens, and processing methods for optimum ova and parasite examinations.
- Understand advantages and disadvantages of preservatives, reagents, and stains used in the ova and parasite examination.
- Be able to recognize important morphological characteristics used to identify pathogenic and nonpathogenic parasites in stool ova and parasite permanent smears and concentrates.
- Demonstrate knowledge of available immunoassays for detection of parasites and describe advantages and disadvantages associated with use of these assays.

Skill Level II

- Gain an understanding of the morphological appearance of parasitic larva or adult worms that may be directly observed in clinical specimens.
- Learn important characteristics used to identify common arthropods brought to the microbiology laboratory for identification.
- Name important antiparasitic agents and the parasites against which they are effective.

VII. Virology

Skill Level I

- Understand the major characteristics of diseases caused by viral pathogens, including clinical presentation, transmission, pathophysiology, and epidemiology.
- Describe viral pathogens that cause disease in specific patient populations, including children, immunocompromised patients, and transplant patients.

- Demonstrate an understanding of proper specimen collection, specimen transportation, and processing methods used for viral culture.
- Demonstrate knowledge of tissue culture techniques and cell types used to grow viral pathogens.
- Describe the hemadsorption test and immunofluorescent staining techniques used for identification of viruses grown in tissue culture.
- Demonstrate knowledge of serological testing methods used to detect HIV antibodies (e.g., enzyme immunoassay, Western blot, and immunofluorescent assay) and describe appropriate HIV testing strategies for adults, children, and neonates.
- Describe advantages and limitations of rapid serological tests used to detect HIV and respiratory viruses.
- Be able to interpret results of antibody tests for hepatitis viruses, herpes viruses, and other important viral pathogens.

Skill Level II

- Identify typical cytopathic effects seen with growth of commonly isolated viruses in tissue culture (e.g., cytomegalovirus, herpes simplex virus, varicella zoster virus, adenovirus, enteroviruses, influenza viruses, and respiratory viruses).
- Demonstrate knowledge of antiviral agents, resistance mechanisms, and susceptibility testing methods for antiviral agents.

Patient Care

- Be able to interpret results from cultures, serology, and molecular testing in conjunction with other laboratory data and clinical presentation to be able to make recommendations for effective testing strategies.
- Understand the use and limitations of drug susceptibility testing, be able to communicate susceptibility results clearly to clinicians, and be able to make knowledgeable choices for testing and reporting of additional or unusual drugs.

Medical Knowledge

- Obtain a satisfactory knowledge of major diseases caused by infectious agents and methods used in the microbiology/virology laboratory to identify pathogens in clinical specimens.
- Demonstrate knowledge of important preanalytical steps in microbiology/virology laboratory testing, such as proper specimen collection, transportation, and processing of specimens as well as important postanalytical issues relating to clear and clinically relevant reporting of test results.
- Demonstrate knowledge of safety issues related to the microbiology/virology laboratory, including handling of infectious agents, chemicals, and possible agents of bioterrorism.

Resident Evaluation

Evaluation tools include: 360 degree (faculty and non-physician), checklist / self evaluation, portfolio tracking via SATs and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones: see AP/CP and CP milestones pp. 93-95 and 97

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences and participation in any additional opportunities such as Infection Control committees. QC/QA and/or CAP inspection committee meetings

Daily duty hours are 7:30 am – 4:30 pm

Additional required conferences:

Tuesday 830-930 Micro/Path conf at OCF

Friday 8-9 City Wide ID conf at OCF

4th Wednesday at WJ – Hospital Quality Committee Meeting

One week of the rotation must be scheduled to occur in the Microbiology Laboratories at ILH. The selected week should be scheduled with input from the supervising faculty and medical technologists. A laboratory checklist will be completed and returned to the PD as documentation of successful completion of the lab week. This week is to be planned for even in the situation wherein a vacation week occurs during the Microbiology Month.

Suggested Reading

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

Forbes BA, Sahm DF, Weissfeld AS, eds. Trevino EA, photographer. Bailey and Scott's Diagnostic Microbiology, 11th ed. St. Louis: CV Mosby, 2002.

Koneman ED, Allen SD, Janda WM, Schreckenberger PC, Winn WC, eds. ColorAtlas and Textbook of Diagnostic Microbiology, 5th ed. Philadelphia: Lippincott Williams & Wilkins, 1997.

Notes:

MICROSCOPY and URINALYSIS

Location: ILH

Length: 0.5 months each combined with Hematology

Director: Rachna Jetly, MD

Additional faculty: Angie Duong, MD

Skill Level differentiation: N/A. One month rotation requirement

Goals and Objectives:

- Understand clinical indications for body fluid analysis.
- Understand manual hemocytometer cell counting.
- Understand cytocentrifuge sample preparation and slide staining.
- Identify blood and body fluid cell morphology.
- Interpret results of body fluid analyses in the appropriate clinical context.
- Recognize malignant cells and recommend appropriate confirmatory tests.
- Correlate abnormal body fluid cell morphology with cytology, flow cytometry, and other relevant diagnostic test results.
- Identify body fluid crystals. Distinguish between urate and calcium pyrophosphate crystals, using polarized light.

II. URINALYSIS

- Understand the clinical indications for and utility of urinalysis.
- Understand the principles of methods involved in urine chemistry and urine sediment analysis.
- Understand the limitations of manual and automated urine chemistry and sediment analysis.
- Interpret routine urine chemistry results and identify abnormal cells and organisms. Provide clinical follow-up as appropriate.

Resident Evaluation

Evaluation tools include: 360 degree (faculty and non-physician), checklist / self evaluation, portfolio tracking via SATs and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones: see AP/CP and CP milestones pp. 93-95 and 97

Rotation Daily Expectations:

Daily duty hours are 7:30 am – 4:30 pm

Residents are expected to attend scheduled didactic conferences.

Suggested Reading

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

King-Strasinger, Schaub Di Lorenzo. Urinalysis and Body Fluids, 4th ed. Philadelphia: FA Davis, 2005.

MOLECULAR PATHOLOGY/CYTOGENETICS

Location: ILH

Length: One month

Director: Carmen Kletecka, MD (ILH)

Additional Supervising Faculty: Paula Gregory, PhD (LSU)
Fern Tsien, PhD (LSU)

Skill Level differentiation: N/A. One month rotation requirement

Goals and Objectives:

I. Molecular Pathology

- Understand basic molecular biology concepts.
- Know molecular testing methods for inherited causes for thrombophilia, such as factor V Leiden, prothrombin 20210 mutation, MTHFR, and platelet glycoprotein III polymorphisms (PIA 1/2).
- Understand molecular testing and interpretation for cystic fibrosis diagnosis and screening.
- Understand molecular testing for hematologic malignancies, including non-Hodgkin lymphomas (T- and B-cell gene rearrangements) and chronic myelogenous leukemia (bcr-abl detection and quantitation for therapeutic monitoring), and other translocation detection or quantitation assays.
- Understand molecular diagnostic tests for detection and speciation of pathogenic organisms, including *Chlamydia trachomatis*, *N. gonorrhoeae*, *M. tuberculosis*, highrisk human papillomaviruses, and viruses that cause encephalitis/meningitis (HSV and enteroviruses).
- Understand qualitative and quantitative methods used to determine viral load in human immunodeficiency virus, cytomegalovirus, Epstein–Barr virus, and hepatitis C virus, as well as human immunodeficiency virus and hepatitis C virus genotyping to direct therapy.
- Be familiar with molecular testing for trinucleotide repeats diseases, such as fragile X.
- Understand pharmacogenomic testing for cytochrome p450 mutations and other mutations that affect sensitivity to chemotherapeutic agents, such as thiopurinomethyltransferase (TPMT), or other drugs.
- Be familiar with molecular testing for hereditary hemochromatosis, including the C282Y and H63D polymorphisms.
- Understand the principles behind human identity testing for transplant (see also the *Immunology and Immunogenetics* section).
- Understand prenatal and preimplantation genetic testing interpretation.
- Understand molecular testing for metabolic diseases 942 Smith et al.: Laboratory Medicine Resident Curriculum such as medium-chain acyl-CoA dehydrogenase deficiency.
- Have awareness of sample types, preparation, and storage for molecular biology tests.
- Understand applicability of testing to samples of blood, bone marrow, body fluids (e.g., CSF, pleural, and peritoneal samples), lymph node, and spleen.
- Understand the use of whole blood from heel stick and mass screening studies.
- Understand storage media and conditions for cells, DNA, and RNA.
- Understand DNA extraction and purification from a variety of biological specimens.
- Understand quantitation of purified DNA by spectrophotometry/ fluorometry and QC of DNA preparations.
- Have knowledge of restriction endonuclease digestion of purified DNA or amplified DNA.

- Understand electrophoretic separation of DNA fragments, native DNA gel electrophoresis for verification of DNA quality, photographic documentation of gels, and capillary electrophoresis methods.
- Have knowledge of total cellular RNA extraction, quantitation, separation of mRNA, and reverse transcription to generate cDNA.
- Understand southern blot DNA hybridization.
- Understand DNA sequencing.
- Have experience and knowledge of in vitro DNA amplification using the PCR and alternative amplification systems, as well as awareness of methods to prevent contamination.
- Understand varying means of analyzing PCR products, e.g., electrophoresis, sequencing, and restriction enzyme digestion.
- Understand mutation detection and scanning technologies for single- and multiple-mutation platforms.
- Understand real-time quantitative PCR and reverse transcription-PCR.
- Understand DNA and gene expression microarrays.
- Understand purification methods for cell subsets for subsequent molecular assays.
- Be able to review the literature to evaluate new molecular markers of disease.
- Develop experience in the use of web-based genomic data bases, e.g., for sequence search and single-nucleotide polymorphism identification.
- Understand the utility of genetic markers based on population-at-risk and disease prevalence.
- Be aware of the legal, ethical, and social implications of genetic testing.
- Understand and use pedigrees for familial genetic assessments.
- Interpret and report molecular results in association with pathologic and laboratory findings and clinical history to reach a final diagnosis.
- Make recommendations for follow-up or confirmatory studies.
- Assess the sensitivity and specificity of testing for an individual patient's disease state.
- Understand use of Bayesian analysis for risk assessments.

II. Cytogenetics

The resident will learn about, and master some of, the technical skills necessary for the practice of clinical cytogenetics. These technical skills include optimal specimen collection, methods of processing various tissues for routine and molecular cytogenetic analyses, different methods for staining and banding metaphase chromosomes, and preparation of samples for fluorescence-based cytogenetic testing (FISH, CGH, SKY). The resident will learn to analyze G-banded metaphase spreads, prepare karyotypes, interpret karyotypic findings, and write the karyotype designation using the International System for Human Cytogenetic Nomenclature (ISCN, 2005). The resident will also learn to interpret results of fluorescence-based molecular cytogenetic testing. The resident will learn how to provide appropriate and effective cytogenetics consultation to clinicians and other health care providers. Consultation may include indications for cytogenetic testing in a variety of clinical situations (products of conception, prenatal diagnosis, suspected constitutional chromosome abnormalities, and acquired clonal chromosome abnormalities in hematologic disorders and non-hematologic solid tumors), specimen requirements for testing, sample collection and transport to the laboratory, interpretation of the test results, recommendations for additional diagnostic tests, and referral to a clinical geneticist or genetic counselor.

The resident will develop a fund of general and specialized medical knowledge necessary for the practice of clinical cytogenetics. This will include knowledge of the more common constitutional chromosome abnormalities, mechanisms by which these abnormalities arise, their phenotypic

consequences, and counseling issues that are raised. It will also include knowledge of the more common recurring chromosome abnormalities found in hematologic disorders and non-hematologic solid tumors; and the diagnostic, prognostic, and biologic implications of these abnormalities. The resident will learn to effectively apply his/her general and specialized medical knowledge of clinical cytogenetics in the day-to-day practice of pathology. The resident is expected to apply his/her knowledge to assess various clinical situations, propose a reasonable differential diagnosis, recommend appropriate cytogenetic testing, establish a definitive diagnosis, and discuss the prognostic and therapeutic implications of the diagnosis.

Patient Care

- Gather accurate clinical and genetic information to generate an appropriate family pedigree.
- Demonstrate the ability to identify family members in need of further testing.
- Understand genetic counseling principles.

Interpersonal and Communication Skills

The resident will learn to communicate clinical cytogenetics and molecular pathology information effectively and courteously with laboratory staff members, health care providers, clerical and administrative staff, and other individuals encountered in the course of his/her rotation. Communication will be verbal and written; and must be clear, concise, and accurate. The resident will learn to work as an effective member of a multidisciplinary team during his/her rotation. The resident is expected to perform his/her tasks in a responsible and timely fashion, to facilitate the tasks of others, and to be respectful and cooperative in his/her interactions with all members of the section.

Professionalism

The resident is expected to treat all members of the genetics section and other individuals encountered during the rotation courteously and respectfully. He/she is also expected to be collegial in all interactions with other members of the health care team. The resident should strive to comport himself/herself in a professional manner at all times. The resident will learn to take his/her professional responsibilities seriously and act accordingly. The resident should strive to approach these responsibilities with a positive attitude, and to complete all tasks and assignments effectively and in a timely fashion. The resident will demonstrate knowledge of regulatory and Health Insurance Portability and Accountability Act (HIPAA) issues pertaining to the use of genetic testing in human research and clinical molecular practice.

Systems-Based Practice

The resident will acquire knowledge of practice and health care delivery systems and an awareness of the role of clinical cytogenetics and molecular pathology in the context of the greater health care system. The resident will learn about general regulatory and financial aspects of health care delivery. In particular, the resident will learn cost-benefit analysis of these services, how to assess the quality of services and which cases are best sent to reference laboratories for testing. The resident will learn some of the general administrative and managerial aspects of a laboratory. These aspects include the principles of quality control and quality management, safety, laboratory staffing, instrumentation, workflow and turnaround time, customer service, and laboratory accreditation.

Practice Based Learning

The resident will learn to effectively use conferences, lectures, teaching cases, and medical literature (texts, journals, and other medical information systems) related to clinical cytogenetics and molecular studies to inform his/her practice of pathology. The resident will develop the ability to critically evaluate the quality of the various sources of information and to select those of the highest quality and reliability for use in medical decision making. The resident will learn to use a variety of

information technologies to augment and improve his/her application of ancillary studies to the practice of pathology. Examples of information technologies to be mastered include electronic medical literature and databases, Web-based information sources, and computer-based resources such as CDs and DVDs.

Resident Evaluation

Evaluation tools include: 360 degree (faculty and non-physician), checklist / self evaluation, portfolio tracking via SATs and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones:

see AP/CP and CP milestones pp. 93-95 and 97.

Rotation Daily Expectations:

Daily duty hours are 7:30 am – 4:30 pm

Residents are expected to attend scheduled didactic conferences.

Suggested Reading

Burtis CA, Ashwood EA, Bruns DE. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 4th ed. St. Louis, MO: Saunders, 2006.

Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods, 20th ed. Philadelphia: WB Saunders, 2001.

Leonard DGB. Diagnostic Molecular Pathology. Philadelphia: WB Saunders, 2003.

Strachan T, Read AP. Human Molecular Genetics, 3rd ed. London: Garland Press, 2004.

Therman E, Susman M. Human Chromosomes, 4th ed. New York: Springer-Verlag, 2001.

Notes:

NEUROPATHOLOGY/RESEARCH

Location: ILH

Length: Minimum one month

Director: William P. Newman, MD (ILH, WJ)

Additional Supervising Faculty: Robin R. McGoey, MD (ILH, WJ)
Randall Craver, MD (CHNOLA)
Bart Farris, MD (WJ)
Luis Del Valle, MD (LSU)

Skill Level differentiation:

Skill level I is applicable to rotations occurring during PGY1 year; while skill level II is applicable to all subsequent rotations.

Goals and Objectives:

To expose pathology residents to various aspects (including immunohistochemistry, molecular genetics and electron microscopy) of neuropathology and to teach them clinicopathological aspects of spectrum of neuropathological diseases through didactic sessions, use of study slide sets, and neuropathology brain cutting sessions. Self study using atlases, textbooks, and websites is also encouraged.

When an autopsy involves neuropathological examination, it is the responsibility of the prosecuting neuropath resident to fix brain sections in formalin for at least seven days. The prosecuting resident will log the brain case into the log book. The resident responsible for the post-fixation examination will be one of the following three residents: 1) the prosecuting resident if assigned to an autopsy/neuropath rotation 2) the next month's resident assigned to neuropath as a rotation, or 3) the resident rotating on neuropath/research. The gross tissue and slides will be reviewed with the faculty and a Neuropathology Protocol on the decedent is generated.

Skill Level 1:

1. Fix brain tissue adequately, log brains into the log book and 'transition the case' competently to the responsible resident
2. Generate a neuropathology protocol, when appropriate to the case
3. Perform a gross neuropathology examination, with knowledge of basic neuroanatomy
4. Describe, dissect and take appropriate sections of neuropathology specimens with an eye to the clinical aspects of the case and basic neuroanatomy.
5. Arrive at a neuropathological diagnosis on common cases.

Skill Level 2:

1. Correlate neuropathology findings with neuropathological imaging
2. Demonstrate capability to take routine sections for gross and microscopic examination of the brain and spinal cord.
3. Preview and prepare microscopic descriptions of all tissues including neuropathologic tissues.
4. Complete a neuropathology protocol with accurate and thorough external and microscopic descriptions

5. Make a clinicopathological correlation statement and communicate it effectively, if requested, in a presentation format
6. Become familiar with methods of processing different types of neuropathological specimens (tumors, infectious lesions, temporal arteries, muscle and nerve). They will be aware of special precautions necessary in processing a variety of specimens such as brain biopsy from a patient with dementia suspected of having Creutzfeldt-Jakob's disease.
7. Obtain a basic understanding of muscle and nerve diseases and will develop the ability to make a diagnosis of common neuromuscular diseases and interpreting the histochemical stains.

Patient Care

The resident is expected to demonstrate a satisfactory level of diagnostic competence and the ability to provide appropriate and effective neuropathology consultation, to communicate effectively with other physicians, medical students and family members; to gather appropriate information about the patient from all available sources; to make informed decisions based on current scientific evidence and sound judgment; to use information technology to support patient diagnostic decisions and education of health care workers; to work with the health care team, e.g. neurologists and neurosurgeons, to support patient diagnosis and management. Case handoffs must be documented in writing in the Neuropath Hand Off binder.

Medical Knowledge

The resident is expected to have knowledge of basic neuroanatomy and neuropathology and common histological and other methods used in neuropathology; have the ability to integrate and analyze clinical information and general autopsy information to put together clinical-pathological correlative assessment

Practice Based Learning

The resident is expected to present concise and complete clinical summary to neuropathologist supervising the autopsy or signing out the microscopic aspects of case; to learn to take appropriate histologic sections of brain and spinal cord. The resident should be able to write a microscopic description and arrive at a diagnosis of common neuropathological conditions. He or she should learn the methods of processing different types of neuropathology specimens, e.g. tumors, temporal arteries, muscle and nerve. The resident must be aware of special precautions warranted for processing specimens from patients with dementia suspected of having Creutzfeldt-Jakob disease.

Interpersonal and Communication Skills

The resident should demonstrate skills that result in effective information exchange and team building with patients, patients' families, and professional associates; express ideas and positions clearly both orally and in writing; ensure that reports are complete and up to date; keep thorough and accurate records; be objective, frank, and concise; listen to others and work effectively with other members of the health care team including technologists, dieners, neurosurgeons, neurologists, medical students, nurses, etc; gives clearly defined orders and administrative directives. The resident should contact physicians who wish to attend neuropathology conferences, e.g. brain cutting. He or she should demonstrate effective verbal and written communication skills in case presentations, descriptions and be an effective teacher of fellow residents and other physicians, medical students, technologists, and others. Information exchanged should include, but is not limited to: (1) antemortem exam, laboratory and imaging findings, (2) date and time of both the death and the autopsy, (3) gross and histopathologic findings already determined, (4) the timeline of the case, and (5) the attending

responsible for the case. Both residents are responsible for ensuring the above noted standards. Case handoffs must be documented in writing in the Neuropath Hand Off binder.

Professionalism

The resident should demonstrate commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diverse patient populations; he/she should carry out duties with dispatch and thoroughness; be prompt and well-prepared for conferences and teaching assignments; assume delegated responsibility; demonstrates stability in critical situations; demonstrate respect, compassion and integrity; be responsive to patient care needs and society at a level that supercedes self-interest; be committed to excellence and on-going professional development; understand and comply with HIPAA and other regulations regarding patient confidentiality and handling of tissues for research and diagnosis.

Systems Based Practice

The resident should be aware of the role of neuropathology in large medical systems and public health, e.g. the importance of dementia or Alzheimer's disease in our aging society; be able to call on system resources to provide pathology services that are of optimal value; understand the reciprocal interaction of neuropathology practice with that of other health care; understands the importance of cost containment without compromise of quality care.

Resident Evaluation:

Evaluation tools include: 360 degree (faculty, non-physician, fellow when applicable and student evaluations), checklist / specific skills evaluations for frozen section*, checklist / self evaluation, portfolio tracking via SATs. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones: see AP/CP and AP Milestones pp. 93-96

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Additional Conferences at discretion of rotation director:

Daily duty hours are Mon-Friday, 7:00 am – 5:00 pm

Residents are expected to be prepared for weekly brain cutting conferences. This includes having adequate prior knowledge of each case including relevant clinical information. Residents should also have previewed any microscopic slides pending neuropath review. Protocols should be drafted and submitted for faculty review following consultation and discussion with supervisors

Additional Conferences may include Friday 8am neuropathology conferences at CHNOLA; and the 3rd Friday 12noon neuropathology conference at WJMC.

Recommended Reading:

1. Gray, DeGirolami and Poirier. Esouerolle and Poirier Manual of Basic Neuropathology, 4th Edition, 2004. Butterworth.
2. Kleihues and Cavenee. Pathology and Genetics of tumors of the Nervous System, 2000. IARC Press.
3. Ellison, Love, Chimelli, Harding, Lowe, Roberts and Vinters. Neuropathology, 2004. Mosby
4. Prayson: Neuropathology, 2005. Elsevier.

PEDIATRIC PATHOLOGY

Location: CHNOLA

Length: minimum one month

Director: Randall Craver, MD (CHNOLA)

Additional Supervising Faculty: Tom Carson, MD (CHNOLA)
Matt Stark, MD (CHNOLA)

Skill Level differentiation: N/A. One month rotation requirement

Goals and Objectives:

Rotation should occur after successful completion of the first year of pathology training.

Upon completing of the rotation the resident should be able to:

1. Utilize pertinent techniques for performing pediatric autopsies.
2. Complete the following objectives listed under surgical pathology, with pertinent adaptations relevant to the pediatric population.
 - 1) Appropriately handle all specimens using universal precautions.
 - 2) Prepare clear, concise surgical pathology reports to include gross description, microscopic description if needed, diagnosis, and pertinent comments.
 - 3) Demonstrate proper sectioning techniques for all surgical specimens to include: identification, gross dissections, orientation, block selection and identification and fixation.
 - 4) Demonstrate proficiency in frozen section technique by: preparing and staining imprints when appropriate, selecting appropriate tissue for sectioning, preparing sections of diagnostic quality, perform within a reasonable time, recognize limitations of the technique and when to defer diagnosis, and maintain cryostat.
 - 5) Recognize situations requiring additional data essential for a diagnosis including: history, radiographs, laboratory data, and description of the operative procedure.
 - 6) Recognize when necessary and appropriately order additional studies including: special histochemical stains, immunohistochemical stains, immunofluorescence studies, flow cytometry and electron microscopy.
 - 7) Communicate with clinicians regarding diagnosis, prognosis, and therapeutic modes when indicated.
 - 8) Recognize when consultation is needed and where to obtain it.
3. Recognize differences in laboratory reference ranges in the pediatric population.
4. The following topics are specifically to be covered during this rotation:

ORGAN BASED PEDIATRIC PATHOLOGY

- I. LUNG: Development and stages
Hyaline membrane disease
Bronchopulmonary dysplasia

- II. KIDNEY: Dysplasia and cystic disease
- III. BRAIN: Intraventricular hemorrhage
- IV. LIVER: Biliary atresia
Neonatal hepatitis
- V. LEUKEMIAS: Acute leukemias, ALL and AML
Immunophenotype, cytogenetics
- VI. GASTRO INTESTINAL: Necrotizing enterocolitis
Reflux esophagitis
Eosinophilic esophagitis
Non-tropical sprue
Hirschsprungs
- VII. SIDS (SUDDEN INFANT DEATH SYNDROME)
- VIII. HEMATOLOGY: Hemoglobin patterns in hemoglobinopathies,
Beta thalassemia

IX. MALFORMATION VERSUS DEFORMATION

X. CARDIOVASCULAR

Anatomy of the heart

- XI. HISTIOCYTOSES: Langerhans cell histiocytoses
Sinus histiocytoses with massive lymphadenopathy
Malignant histiocytoses
Familial lymphohistiocytosis
Viral Erythrophagocytic syndrome

- XII. BLOOD BANK: Neonatal exchange transfusion
ABO and Rh compatibility

- XIII. MUSCULOSKELETAL:
Muscular dystrophy, Duchenne & Becker
Dermatomyositis

- XIV. TUMORS: Retinoblastoma
Wilm's Nephroblastoma
Neuroblastoma
Medulloblastoma
Pilocytic astrocytoma

Patient Care

Residents gather relevant clinical information from on-line patient data systems and/or patient charts as well as discussion with clinicians. Review all diagnostic pathologic material. Prepare and interpret intraoperative consultation slides and permanent section histopathology previewing. Gross the specimens efficiently and accurately. Communicate effectively with clinicians regarding intraoperative consultations and routine surgical pathology cases. Preview and render preliminary diagnoses on cases prior to review with faculty.

Medical Knowledge

Residents will demonstrate knowledge about established and evolving diagnostic scientific practice by developing differential diagnoses for pediatric pathology cases based on clinical data, gross and microscopic information and pertinent literature. Recommend additional testing (ultrastructural, immunohistochemical, biochemical, etc.) as appropriate and synthesize these into an appropriate final diagnosis for the surgical pathology report. Residents will also demonstrate knowledge of gross pathology and anatomy by dissection and dictation of surgical pathology specimens.

Practice-Based Learning and Improvement

Residents will demonstrate the ability to analyze their practice experience by systematically evaluating their reports for factual and/or typographical errors. Residents must correlate their diagnoses with those rendered by faculty and thus guide their learning to improve diagnostic capabilities. Residents will investigate complicated cases, assess their diagnostic and consultative service, and incorporate scientific evidence into their practice for the continual improvement of their patient care. 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

Residents will demonstrate effective, respectful, and professional communication with other health care professionals, patients and patient's families. This will be assessed by presentations at interdisciplinary tumor boards, interdepartmental and departmental conferences, and interaction with clinicians during intraoperative consultations. This will be evaluated by faculty observation of resident performance on individual cases.

Professionalism

Residents must demonstrate respect, integrity, compassion, sensitivity to diverse patient populations, a commitment to medical ethics and professional responsibilities, and a responsiveness to patient's needs that supercedes their own self interest. This may be evidenced by timely response and completion of intraoperative consultations, completing reports in a timely manner, being sensitive to religious concerns of families, and recognizing the importance of confidentiality and informed consent in medical practice. Residents must also exhibit appropriate behavior with peers, clinicians, faculty, and technical, clerical and administrative faculty. This is evaluated by close personal observation of surgical pathology faculty and faculty in their daily interactions with residents.

Systems-Based Practice

Residents will demonstrate an awareness of and responsiveness to the health care system context in which the surgical pathology service must function. This includes an understanding of how the diagnoses they render affect health care decisions for patients and the health care system. Residents must understand the importance of rational use of specialized tests (e.g. immunohistochemical stains or ultrastructural analysis) in order to provide cost-effective care without compromising quality. Residents must understand the importance of quality assurance and participate in surgical pathology performance improvement committee activities as they relate to improving functions within the laboratory as well as the laboratory's interactions with the larger health care system.

Resident Evaluation

Evaluation tools include: 360 degree (faculty, non-physician, fellow when applicable and student evaluations), checklist / specific skills evaluations for frozen section, checklist / self evaluation, portfolio tracking via SATs, and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be given a MCQ on topics listed above in G&O. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Residents will also prepare a PowerPoint presentation at the end of the month and be provided with feedback on the quality of the content and the delivery of the material.

Milestones: see all AP/CP, AP and CP milestones pp. 93-97

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Additional Conferences at discretion of rotation director:

Daily duty hours are Mon-Friday, 7:00 am – 5:00 pm

Optional Activities:

Complete a laboratory inspection using the College of American Pathologist checklist.

Review all quality control/quality assurance records for completeness, accuracy and corrective action during the rotation.

Review a section of the procedure manual for completeness, adherence to NCCLS guidelines, clarity, usefulness, proper approval, and relationship to actual laboratory practices. Understand how to develop a new procedure, and the documentation required if there is to be any deviations from NCCLS guidelines.

Review the procedures for requisitioning a sample; entering orders, entering and verifying results, and producing preliminary and final reports using the laboratory information system.

Review the mechanisms for employee performance evaluation and discipline procedures.

Review the safety manual and laboratory disaster plan, and pertinent federal and state regulations related to the section

Suggested Reading

Stocker JT, Dehner LP (Eds): Pediatric Pathology, 2nd Ed., Lippincott-Williams & Wilkins, Philadelphia, 2001.

Notes:

SURGICAL PATHOLOGY (including Advanced Surgical Pathology)

Location: ILH
West Jefferson Medical Center (WJMC)
Ochsner Clinic Foundation (OCF)

Length: Minimum fourteen months

Directors: L. Pei, MD (ILH)
K. Farris, MD (WJMC)
N. Davis, MD (OCF)

Additional Supervising Faculty: B. Ruiz, MD (ILH)
T. Dewenter, MD (ILH)
R. Jetly, MD (ILH)
R. Bhalla (ILH)
A. Duong (ILH)
C. Kletecka (ILH)
W. Luer, MD (WJ)
J. Brown, MD (WJ)

Goals and Objectives:

Skill Level I is applicable to rotation during years one and two of training while skill level II is applicable to remaining rotations.

I. Surgical Pathology

Skill Level I

- Demonstrate ability to obtain pertinent information from patient's medical record and/or from attending faculty and residents
- Demonstrate knowledge of basic and common elements of the surgical pathology report including: identification (patient and institution), input from responsible clinician and pathologist, necessary dates and times pertinent to the report, necessary clinical data, and documentation of the specimens that were received, including type of fixation.
- Demonstrate ability to appropriately handle all specimens using universal precaution.
- Demonstrate ability to select correct pieces of tissue for sectioning and preservation, and maintenance and identification of tissue orientation during processing.
- Show ability to dissect tissue in such a way as to preserve important pathologic findings and fix them in such a way that they may be used for clinicopathologic correlation.
- Demonstrate ability to select correct tissues and fixatives for special histologic preparation; list common stains, their indications and expected results in appropriate tissues.
- Demonstrate knowledge of tissues that require special handlings e.g. flow cytometry, microbiological studies, electron microscopy, immunohistology, etc.
- Demonstrate understanding of the lymphoma protocol for tissues such as lymph node, spleen, tonsils or any other extra-nodal tissue, as follows:
 1. Depending on size of specimen, tissue should be bisected, trisected or sliced at thin intervals with a fresh blade, preferably along the longitudinal axis.
 2. Air-dried touch imprints should be made on 2 slides labeled with the patient's name and hospital number. These should be stained with Diff-quick stains (available in

refrigerator). Note: cut surface of tissue should be blotted with paper-towel to remove extra fluid or blood before touch imprints are made.

3. Keep one slide for the flow cytometry lab and the other for surgical pathology.
4. A small piece of tissue should be submitted for flow cytometry studies in sterile tissue culture media – RPMI in our lab.
 - a. No set amount of tissue needed is generally defined and mostly depends on size of received specimen. In general, extranodal specimens have more connective tissue stroma and more tissue is better for these specimens.
 - b. To ensure representative sample, take tissue closer to the sections that will be submitted for histology, avoiding tips and peripheral/sub-capsular tissue.
 - c. RPMI media (pinkish-red fluid) is always available in refrigerator. Pour a generous amount in an empty plastic tube (also present in the refrigerator) labeled with the patient's information and add the tissue to this tube.
5. Remaining tissue can now be submitted in formalin.
6. Bring the tissue (in RPMI tubes) and one slide to the Flow cytometry lab on 4th floor.
7. Fill out the requisition slip before handing the specimen to the lab techs.

-Ability to select appropriate tissue for frozen section examination, section and stain appropriately.

-Ability to take appropriate gross photographs.

-Demonstrate familiarity with the organization of the histology lab including instrumentation, work flow, and information histotechnologists need to process tissue properly.

-Demonstrate knowledge of appropriate storage and disposal of fixatives and tissues.

-Be able to evaluate tissue margins of tumor resection specimens utilizing frozen sections and touch preparations.

-Know the procedures for reporting untoward incidents in the lab and appropriate actions in event of chemical or hazardous exposures

-Demonstrate basic knowledge of requirements (JCCAHO, CAP, legal jurisdiction) of pathology specimens and records.

-Demonstrate ability to utilize the laboratory informatics system.

-Complete a laboratory inspection using the College of American Pathologists checklist

-Know current regulations regarding patient confidentiality derived from the Health Insurance Portability and Accountability Act (HIPPA) and how they affect the handling of laboratory data as well as human tissue for diagnostic and research purposes.

-Demonstrate knowledge of basic principles of immunohistochemistry.

-Demonstrate knowledge of appropriate collection, fixation and preparation of tissue samples for immunohistochemistry.

Skill Level II

-Demonstrate knowledge of common indications and limitations for intraoperative consultations.

-Demonstrate proficiency of preparing, interpreting and reporting an intraoperative consultation (frozen section) within twenty minutes of receiving a specimen in the laboratory

-Demonstrate the ability to construct a complex surgical pathology report.

-Demonstrate knowledge of common grading and staging systems (e.g. AJCC) applied to malignant neoplasms.

-Be able to properly prepare synoptic surgical pathology report for common malignant neoplasms.

-Demonstrate ability to prepare necessary addenda or supplemental reports for surgical pathology reports.

- Demonstrate knowledge of when to seek additional or external consultation for cases and document such appropriately.
- Demonstrate ability to prepare consultation reports on referred material and transmit those reports to the requesting pathologist.
- Demonstrate ability to prepare intraoperative cytology smears.
- Demonstrate ability to manage work flow in the laboratory, assist junior residents with dictations and dissections, provide accurate dissection and dictation of complex specimens, utilizing the anatomic laboratory information system, and practice safety in the surgical pathology laboratory.
- Demonstrate knowledge of procedures for locating missing specimens and resolving questions of specimen identification.
- Be independently able to report histopathologic aspects of routine and complex cases, including those prepared by junior residents, development of differential diagnoses and ordering of appropriate ancillary tests and stains.
- Demonstrate knowledge of quality control of histologic sections and special stains, including trouble-shooting of mistakes in accessioning, labeling and misidentification of specimens.
- Become familiar with the mechanisms for employee performance evaluation and discipline procedures
- Demonstrate knowledge of the interpretation of positive and negative immunohistochemical results and artifacts.
- Demonstrate an ability to select proper antibody panels for the differential diagnosis of neoplastic disease.
- Demonstrate knowledge of prognostic factors that are detectable by immunohistochemical studies of paraffin sections.

Residents in their **final year of training** are also expected to:

1. Formulate provisional diagnoses on all intraoperative consultations prior to faculty final diagnoses
2. Assist in supervision of junior residents and/or medical students including timely completion of an evaluation of his/her junior resident.
3. Demonstrate ability to dictate provisional diagnoses on previewed surgical pathology cases
4. Monitor workflow of all accessioned specimens during course of month including real-time monitoring of turn-around-time and sign-out status of specimens through utilization of CoPath computer system
5. Interface between histotechnologists and faculty pathologists regarding specimen handling and workflow
6. Have evident documentation of all scholarly activity relating to surgical pathology cases including power points, posters and/or publications

The **Advanced Surgical Pathology Elective at OCF** may be scheduled anytime after successful completion of twelve months of training in surgical pathology. Goals and objectives are primarily on active participation in processing and sectioning of all intraoperative consultations as well as preliminary diagnostic formulation under direct supervision of a staff pathologist. Following consultation, residents will gross the permanent specimen and participate in sign out of cases.

Patient Care

Residents gather relevant clinical information from online patient data systems and/or patient charts

as well as discussion with clinicians. Review previous diagnostic pathologic material. Prepare and interpret intraoperative consultation slides. Communicate effectively with clinicians regarding intraoperative consultations and routine surgical pathology cases. Preview and render preliminary diagnoses on cases prior to review with faculty. Residents must practice effective transitions in care (TIC) when handing off surgical pathology cases to the incoming team of surg path residents. Both the donating and receiving resident involved in the TIC must abide by patient care standards in regards to diagnostic accuracy, status of case, attending pathologist in charge of the case and timeliness in completion of the case. Both residents are responsible for ensuring the above noted standards. TIC must occur with both a verbal (face-to-face) and a written (CoPath checklist) component. All TIC policies apply when a resident has leave during a surgical pathology rotation. TIC policies also apply when a case is being presented at tumor board. **TIC documentation will be maintained in the binder on the SurgPath service floor.**

Medical Knowledge

Residents will demonstrate knowledge about established and evolving diagnostic scientific practice by developing differential diagnoses for surgical pathology cases based on clinical data, gross and microscopic information and pertinent literature. Recommend additional testing (ultrastructural, immunohistochemical, biochemical, etc.) as appropriate and synthesize these into an appropriate final diagnosis for the surgical pathology report. Residents will also demonstrate knowledge of gross pathology and anatomy by dissection and dictation of surgical pathology specimens.

Practice-Based Learning and Improvement

Residents will demonstrate the ability to analyze their practice experience by systematically evaluating their reports for factual and/or typographical errors. Residents must correlate their diagnoses with those rendered by faculty and thus guide their learning to improve diagnostic capabilities. Residents will investigate complicated cases, assess their diagnostic and consultative service, and incorporate scientific evidence into their practice for the continual improvement of their patient care. 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

Residents will demonstrate effective, respectful, and professional communication with other health care professionals, patients and patient's families. This will be assessed by presentations at interdisciplinary tumor boards, interdepartmental and departmental conferences, and interaction with clinicians during intraoperative consultations. This will be evaluated by faculty observation of resident performance on individual cases. IPCS are critical to all TIC situations. IPCS will be evaluated during the hand-off procedure.

Professionalism

Residents must demonstrate respect, integrity, compassion, sensitivity to diverse patient populations, a commitment to medical ethics and professional responsibilities, and a responsiveness to patient's needs that supercedes their own self interest. This may be evidenced by timely response and completion of intraoperative consultations, completing reports in a timely manner, being sensitive to religious concerns of families, and recognizing the importance of confidentiality and informed consent in medical practice. Residents must also exhibit appropriate behavior with peers, clinicians, faculty, and technical, clerical and administrative faculty. This is evaluated by close personal observation of surgical pathology faculty and faculty in their daily interactions with residents.

Systems-Based Practice

Residents will demonstrate an awareness of and responsiveness to the health care system context in which the surgical pathology service must function. This includes an understanding of how the diagnoses they render affect health care decisions for patients and the health care system. Residents must understand the importance of rational use of specialized tests (e.g. immunohistochemical stains or ultrastructural analysis) in order to provide cost-effective care without compromising quality. Residents must understand the importance of quality assurance and participate in surgical pathology performance improvement committee activities as they relate to improving functions within the laboratory as well as the laboratory's interactions with the larger health care system.

Resident Evaluation

Evaluation tools include: 360 degree (faculty, non-physician, senior peer and student evaluations), checklist / specific skills evaluations for frozen section*, checklist / self evaluation, portfolio tracking via SATs, and written multiple choice questions (MCQs) as seen in the RISE examination scores. Residents will also be provided with constructive feedback by the attending faculty during the rotation.

Milestones: see surg path specific milestones PC5 and PC6 and all AP/CP and AP milestones pp. 93-96.

Rotation Daily Expectations:

Daily duty hours include expected attendance at the resident didactic conferences.

Additional Tumor Board Conferences: ILH: Tues@0700; WJMC: Wed@0700

Daily duty hours are Mon-Friday, 7:00 am – 5:00 pm.

All residents are to attend faculty slide sign-out each day until 11:30am, at which time, the resident charged with grossing that day may be excused to triage specimens and begin grossing.

Supervision: see pp. 14

For PGY1 residents assigned to grossing, at least the initial 3 of each organ system will be directly supervised by either a >PGY-3 resident or a faculty member. Documentation of the direct supervision will occur in two ways: the gross dictation and the grossing checklist (see Appendix pp. 100-101). At least the initial 3 frozen section preparation processes will also be directly supervised by >PGY-3 resident or a faculty. Frozen section signout (diagnosis) will always be directly supervised by a faculty.

Suggested Reading

Departmental Surgical Pathology Procedure Manual

Rosai J, Rosai and Ackerman's Surgical Pathology, 9th Ed, Mosby, New York, 2004

Stocker JT, Dehner LP (Eds): Pediatric Pathology, 2nd Ed., Lippincott-Williams & Wilkins, Philadelphia, 2001.

Dabbs DJ, Diagnostic Immunohistochemistry, Churchill-Livingstone, New York, 2002.

Erlandson RA, Diagnostic Transmission Electron Microscopy of Tumors, Raven Press, New York, 1994

PC5: Procedure: Surgical Pathology grossing: Demonstrates attitudes, knowledge and practices that enables proficient performance of gross examination (analysis and appraisal of findings, synthesize and assemble and reporting) (AP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Understands common surgical procedures and the resultant specimens</p> <p>Recognizes the importance of grossing for the interpretation of histology and management of patients</p> <p>Applies prior knowledge and draws on resources to learn normal gross anatomy</p>	<p>Demonstrates familiarity with gross manual or similar reference book</p> <p>Ensures and maintains the integrity of specimens to avoid cross-contamination or identity mix-up</p> <p>Correctly describes and appropriately samples common surgical specimens, including necessary tissues for ancillary studies in correct media/fixative</p> <p>Correlates clinical and/or radiological information</p> <p>Understands the components of an appropriate and complete report</p> <p>Develops time management skills</p>	<p>Applies principles of grossing to newly encountered specimen types</p> <p>Correctly describes and appropriately samples common and uncommon surgical specimens</p> <p>Recognizes when additional gross sampling is necessary for diagnosis or staging</p> <p>Produces reports that contain all the necessary information for patient management; edits transcribed reports effectively</p> <p>Demonstrates increasing efficiency in grossing specimens</p>	<p>Has a portfolio of grossed specimens that demonstrates competency across a range of complex specimens</p> <p>Correctly describes and appropriately samples all specimen types</p> <p>Dictates complete, logical and succinct descriptions</p> <p>Efficient in grossing specimen</p>	<p>Demonstrates an expanded portfolio of competency in grossing specimens of a widely diverse and complex specimen type</p> <p>Proficient in the performance of surgical pathology gross examination</p> <p>Proficient in the production of complete, logical and succinct descriptions</p>

PC6: Procedure: Intraoperative consultation/ frozen sections: Demonstrates attitudes, knowledge and practices that enables proficient performance of gross examination, frozen section (analysis and appraisal of findings, synthesize and assemble and reporting) (AP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Understands common surgical procedures and the resultant specimens and potential intra-operative consultation/frozen section/intraoperative cytology (IOC/FS)</p> <p>Recognizes the role of the surgical pathologist in the management of patients including the utilization of cancer staging</p> <p>Applies prior knowledge and draws on resources to learn normal gross anatomy, histology</p>	<p>Is aware of indications and contraindications for IOC/FS and follows protocols and regulations</p> <p>Procures tissue for diagnosis under supervision</p> <p>Prepares IOC/FS that are of good interpretive quality</p> <p>Understands and follows correct call back guidelines</p>	<p>Discusses with pathology attending staff any requests that are contraindicated</p> <p>Correctly selects tissue for frozen section diagnosis independently.</p> <p>Able to perform high quality IOC/FS on technically difficult and multiple specimens; performs IOC/FS within turnaround time standards</p> <p>Effectively communicates the diagnosis and is cognizant of the impact of diagnosis on patient care, even in ambiguous situations</p>	<p>Appropriately and professionally discusses with requesting provider any IOC/FS that is contraindicated</p> <p>Responds appropriately to the concerns of the surgeon</p> <p>Given discussion of the case with the attending staff, communicates appropriately with surgeon, asking appropriate questions that influence diagnosis</p>	<p>Proficient in the performance of IOC/FS</p> <p>Able to manage competing tasks, especially in time sensitive situations</p>

Appendix: General Milestones for AP/CP

Patient Care:

PC1: Consultation: Analyzes, appraises, formulates, generates and effectively reports consultation (AP and CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Understands the implications of and the need for a consultation</p> <p>Observes and assists in the consultation</p> <p>Understands the concept of a critical value and the read-back procedure</p> <p>Understands and applies EMR to obtain added clinical information</p> <p>Can define appropriate disclosure of protected health information (PHI) as defined by HIPAA</p> <p>Understands that advanced precision diagnostics and personalized medicine (e.g., molecular diagnostic testing) may be applied to patient care for genetic, neoplastic and infectious disorders, and population health</p>	<p>Prepares a draft consultative report (verbal or written)</p> <p>Performs timely, clinically useful consultation for requests for products or additional testing</p> <p>Knows the critical value list and participates in the critical value call-back of results</p> <p>Understands the importance of accurate, timely, and complete reporting of laboratory test results</p> <p>Understand and apply policies and procedures in protected health information (PHI) as defined by HIPAA</p> <p>Understands the role of specific advanced precision diagnostics and personalized medicine assays, and how results affect patient diagnosis and prognosis, and overall patient care</p>	<p>Prepares a full consultative report with a written opinion for common diseases</p> <p>Prioritizes and presents patient care issues for report after call</p> <p>Answers routine pathology questions, drawing upon appropriate resources</p> <p>Applies the escalation procedure for failed critical value call-backs; understands rationale for critical value list</p> <p>Effectively communicates preliminary results on cases in progress</p> <p>Able to teach allied health professionals and clerical staff on the policies and procedures of protected health information (PHI) as defined by HIPAA</p> <p>Understands pre-analytic issues and quality control for advanced precision diagnostics and personalized medicine</p>	<p>Independently prepares a full consultative written report with comprehensive review of medical records on common and uncommon diseases</p> <p>Runs report conference after call</p> <p>Develops a portfolio of clinical consultation experience</p> <p>Can recommend new or alternate escalation procedures for failed critical value call backs</p> <p>Suggests evidence-based management, prognosis and therapeutic recommendations based on the consultation</p> <p>Able to assist colleagues in the policies and procedures of protected health information (PHI) as defined by HIPAA</p> <p>Can serve as a consultant to clinicians on the recommendation and interpretation of advanced precision diagnostics and personalized medicine</p>	<p>Proficient in pathology consultations with comprehensive review of medical records</p> <p>Demonstrates an expanded portfolio of clinical and patient care experience with pathology consultation</p> <p>Participates in intuitional processes of generating the critical value list</p> <p>Is proficient in consultation regarding test recommendation and treatment decision based on advanced precision diagnostics and personalized medicine</p>

Medical Knowledge

MK1: Diagnostic Knowledge: Demonstrates attitudes, knowledge and practices that incorporate evidence-based medicine and promote life-long learning (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Identifies the resources for learning in pathology	Assimilates medical knowledge in pathology from various learning sources; Demonstrates textbook level diagnostic knowledge for pathology	Performs scientific literature review and investigation of clinical cases to inform patient care (evidence-based medicine)	Able to apply and synthesize medical knowledge and scientific literature review and investigation to inform patient care (evidence-based medicine)	Contributes to medical knowledge of others and participates in life-long learning through literature review, CME and SAMs

Interpersonal and Communication Skills

ICS1: Intra-departmental interactions and development of leadership skills: Displays attitudes, knowledge and practices that promote safe patient care through team interactions and leadership skills within the laboratory (AP/CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Is receptive to instruction from and respects all members of the pathology team	Works effectively with all members of pathology team; attends laboratory departmental or institutional committee meetings	Understands own role on team and flexibly contributes to team success through willingness to assume appropriate roles as needed; understands the basics of running a meeting	Helps to organize team to facilitate optimal communication and co-education among members; demonstrates the ability to lead and run a meeting effectively	Leads teams effectively; models behavior of mutual respect for others

ICS2: Inter-departmental and Healthcare Clinical Team interactions: Displays attitudes, knowledge and practices that promote safe patient care through interdisciplinary team interactions (AP/CP)

Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Recognizes the importance of clinical input in formulating a differential diagnosis and composing a final diagnosis</p> <p>Aware of the significance of conflict in patient care</p> <p>Aware that multi-disciplinary conferences (MDC) are used to further appropriate patient care</p> <p>Awareness of pathologist role in clinical team</p> <p>Understands utility of communication with clinical team</p>	<p>Participates through observation and active interaction with clinician for obtaining relevant clinical and/or radiologic data</p> <p>Aware of the mechanisms for conflict resolution</p> <p>Attends MDC</p> <p>Recognizes the importance of timely production of a final diagnosis and the role it plays in patient care</p> <p>Appropriately triages requests for information from clinical team</p>	<p>Assesses, analyzes and interprets pathology reports and is able to discuss findings in consultation with clinical colleagues</p> <p>Utilizes mechanisms for conflict resolution and helps to defuse and ameliorate conflict</p> <p>Prepares and presents cases at MDC</p> <p>Responds to inquiries from clinical team to contribute to patient care</p> <p>Effectively communicates clinically significant or unexpected values, including critical values</p>	<p>Routinely interfaces with clinical colleagues to formulate a narrow differential diagnosis and arrive at a final diagnosis</p> <p>Effectively participates in conflict resolution</p> <p>Leads MDC</p> <p>Knows how subtleties may impact or alter patient care; recognizes and uses nuances in the proper wording in the discussion of pathology findings</p> <p>Participates in or leads communication with clinical team to contribute to patient care</p>	<p>Fully participates as member of healthcare team and is recognized as proficient by peers and clinical colleagues</p> <p>Models effective conflict prevention and resolution</p> <p>Organizes and is responsible for MDC</p> <p>Serves as consultant to healthcare team</p>

Practice Based Learning and Improvement

PBL1: Recognition of errors & discrepancies: Displays attitudes, knowledge and practices that permit improvement of patient care from study of errors and discrepancies. (AP/CP)

Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Acknowledges and takes responsibility for errors when recognized</p>	<p>Recognizes limits of own knowledge; Initiates self-reflection process, (e.g., as evidenced in self-assessment interviews with program director)</p>	<p>Able to reflect upon errors in a group setting (such as M&M type conference setting); participates in root cause analysis (RCA)</p>	<p>Demonstrates significant awareness of own blind spots; participates in or leads communication of error/discrepancies to clinicians</p>	<p>Models use of errors and discrepancies to improve practice; Provides immediate communication of error/discrepancies to clinicians</p>

Systems Based Practice

SBP1: Patient safety: Demonstrates attitudes, knowledge and practices that contribute to patient safety (AP/CP)

Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Understands the importance of identity and integrity of the specimen and requisition form and verifies the identity</p> <p>Understands the risk inherent in handoffs</p>	<p>Consistently checks identity and integrity of specimen; independently obtains clinical information when needed; resident explores other resources such as EMR and radiology; handles deviations from policies (waivers) with supervision</p> <p>Performs handoffs in an appropriate manner, according to guidelines (e.g., Situation-Background-Analysis-Recommendation [SBAR] or local guidelines)</p>	<p>Can trouble-shoot pre-analytic problems, including deviations from policies (waivers) with minimal supervision</p> <p>Be familiar with and follow patient safety policies and accreditation requirements</p>	<p>Can trouble-shoot patient safety issues (including pre-analytic, analytic and post-analytic)</p>	<p>Models Patient Safety practices; able to write and implement policies on Patient Safety</p> <p>Completes MOC patient safety module</p>

Appendix: General Milestones for AP

PC3: Interpretation and diagnosis: Demonstrates attitudes, knowledge and practices interpretation, analysis, formulates and generates diagnoses (AP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Recognizes the importance of a complete pathology report, with the essential elements for patient care through observation of attending staff generation of reports</p> <p>Recognizes normal anatomy and histology</p>	<p>Generates a list of next steps (ancillary testing; has awareness of options available) needed to refine differential in the clinical context</p> <p>Begins to make connections between clinical differential diagnosis, gross and microscopic pathologic findings</p> <p>Usefully distinguishes normal from abnormal histology and recognizes confounding factors</p>	<p>Recognizes appropriate ancillary tests and refines knowledge of "next steps" and proper utilization for application to differential</p> <p>Correlates the clinical differential diagnosis with gross and microscopic pathologic findings</p> <p>Consistently recognizes and correctly identifies common histopathologic findings (develops a "good eye"); able to troubleshoot (e.g., tissue artifacts, processing and sampling issues)</p>	<p>Interprets ancillary testing results in clinical context</p> <p>Analyzes complex cases, integrates literature and prepares a full consultative written report with comprehensive review of medical records</p> <p>Makes accurate diagnoses reliably, appreciates the nuances of diseases and is able to independently troubleshoot confounding factors</p>	<p>Assesses, analyzes and is able to distinguish subtle differences in difficult cases</p> <p>Proficient in interpretation with comprehensive review of medical records</p> <p>Seeks appropriate consultations</p>

PC4: Reporting: Analyzes data, appraises, formulates, and generates effective and timely reports (AP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Applies prior knowledge and draws on resources to learn normal gross anatomy, histology</p>	<p>Attends and contributes to gross conference</p> <p>Brings clinical/ancillary information to sign out (e.g. radiology, prior cases, reading about case)</p> <p>Generates preliminary report and/or PAD (for autopsy) prior to sign-out with attending staff/responsible physician</p> <p>Becomes familiar with synoptic reporting</p>	<p>Reliably applies knowledge of gross and histologic features in formulating a diagnosis for common entities; able to present at gross conference</p> <p>Able to select, order, and interpret clinical/ancillary information to refine a differential diagnosis</p> <p>Composes a complete and accurate report on common specimens; able to generate a cause of death and manner of death for autopsy</p> <p>Knows when synoptic reporting/template required</p>	<p>Reliably applies knowledge of gross and histologic features in formulating a diagnosis for common and uncommon entities; seeks appropriate consultations</p> <p>Integrates clinical/ancillary information into report</p> <p>Composes a complete and accurate report on common and uncommon specimens (including autopsies)</p> <p>Communicates effectively with family members, where applicable</p> <p>Able to complete synoptic report accurately</p>	<p>Participates in peer review consultation with colleagues (intradepartmental)</p> <p>Manages ambiguity and uncertainty in result interpretation and ancillary testing</p> <p>Produces a report with complete accurate gross and histopathologic findings, including ancillary studies, integrates evidence-based medicine/current literature and knowledge</p> <p>Ensures communication of results to appropriate audiences</p> <p>Keeps current with evolving standards of synoptic reporting</p>

Appendix: General Milestones for CP

Patient Care:

PC2: Interpretation and reporting: Analyzes data, appraises, formulates, and generates effective and timely reports (CP)					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<p>Identifies key elements in the health care record</p> <p>Observes and assists in the interpretation and reporting of the diagnostic test</p> <p>Understands indications for common tests</p>	<p>Uses clinical correlation to interpret and report test results</p> <p>Describes the test platform and methodology</p> <p>Accurately interprets and reports the results</p> <p>Understands and applies algorithms in the work-up for common diagnoses</p>	<p>Limits and focuses a differential diagnosis</p> <p>Knows the current and up-to-date literature about the test result</p> <p>Prepares a differential diagnosis for abnormal results</p> <p>Understands and applies algorithms in the work-up for common and uncommon diagnoses</p>	<p>Able to lead discussion on developing a differential diagnosis based upon clinical information</p> <p>Interfaces with clinical team to recommend tests, based upon current literature</p> <p>Knows potential confounding factors that may contribute to erroneous abnormal results</p> <p>Understands and prudently applies justification for approval of costly testing</p>	<p>Proficient in using health care records, and clinical information to develop a limited and focused differential diagnosis</p> <p>Critically evaluates and applies the current literature</p> <p>Proficient in the interpretation and reporting of clinical pathology test results in the context of the patient's medical condition</p> <p>Proficient in algorithms in the work-up for all diagnoses; writes policies on algorithms for testing</p>

Appendix: Additional information for CHNOLA Hematology/Flow rotation

SKILL LEVEL 1- one month rotation

Hematology:

1. Goals : Become proficient in the interpretation of hematology tests provided by Children's Hospital
2. Objectives:
 - a. Review all bone marrow specimens with pathologist
 - i. A 300 cell count is to be performed on every case, before sign-out.
 - ii. Recognition of morphology is the primary goal of this rotation, case of the day, other flow cytometry cases, CSF, peripheral bloods are secondary.
 - b. Review any peripheral bloods with abnormal findings or pathologist review requests.
 - c. Describe the CBC technology-how performed
 - d. Describe the CBC indices
 - i. Immature reticulocyte fraction
 - ii. RDW CV and SD
 - e. Describe hemoglobin variant analysis, and how to diagnose:
 - i. Hemoglobinopathies
 - ii. Thalassemia
 - iii. Technology
 - f. Perform bone marrow differentials on all patients, to review and compare with tech results at sign out.
3. Present new diagnoses and relapses at Tuesday morning conference.

Flow Cytometry:

1. Goals:
 - a. Develop proficiency in interpreting cell surface markers
 - b. Describe the basis of technology used for flow cytometry
 - c. Describe various clinical utilizations of flow cytometry, other than oncologic.
2. Objectives:
 - a. Describe markers and profiles of:
 - i. Leukemias
 - ii. Lymphomas- lymphoblastic, Anaplastic, Burkitt's
 - iii. Immune deficiencies
 - iv. DNA indices
 - v. Respiratory burst
3. View one technical procedure
 - a. Review technology
4. Review power points related to flow cytometry.
5. Review teaching cases and discuss with Dr. Stark
6. Meet with Dr. Leiva to review flow technology and procedures (view at least 1 procedure)
7. Describe the principles and current uses of detecting minimal residual disease.

Give Thursday Morning Conference on either a Hematology or Flow topic the last Thursday in the month.

- Conference will be specific to pediatrics, timely; a majority of information presented will be from the past two years.

- Conference will be narrow (Example: AML is unacceptable, Myeloid leukemia associated with Down syndrome is acceptable).
- A title and three objectives will be decided on one week before the conference, e-mailed to Dr. Stark for approval.
 - Objectives will use words describe, discuss, review, demonstrate.
 - Objectives will not use understand.

Signature_____

Date_____

Staff Pathologist(s): _____

Date_____

Appendix: Direct Supervision – Grossing

Direct Supervision Policy of Residents: Gross Dissection of Surgical Pathology Specimen by Organ System

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	Procedure 1		Procedure 2		Procedure 3	
	Acc #	M.D.	Acc #	M.D.	Acc #	M.D.
Appendix, routine						
Bone (eg. Extremity, digits)						
Breast						
Biopsy						
Larger specimen (eg. Mastectomy requiring orientation)						
CNS (eg. Brain biopsy)						
CVS (eg. Valve, vessel)						
Gallbladder						
Gastrointestinal System						
Biopsy						
Larger specimen (eg. Hemicolectomy, gastrectomy)						
Gross only (eg. Hardware)						
GYN						
Biopsy (eg. ECC, EMB, conization)						
Larger resection (eg. Hysterectomy, oophorectomy)						
Head and Neck						
Larynx						
Salivary Gland						
Thyroid, non-biopsy, larger specimen						

Appendix: Direct Supervision – Grossing

Direct Supervision Policy of Residents: Gross Dissection of Surgical Pathology Specimen by Organ System

Hematolymphoid (eg. LN, spleen)			
Kidney			
Biopsy			
Larger specimen			
Liver			
Biopsy			
Larger specimen			
Pancreas			
Placenta			
Products of Conception			
Prostate			
Biopsy			
Larger specimen requiring orientation			
Respiratory system			
Biopsy			
Larger specimen			
Skin			
Biopsy			
Ellipse or other requiring orientation			
Soft tissue (eg. Lipoma, sarcoma)			
Urinary bladder			
Biopsy			
Larger specimen			