Allina Hospitals, Anatomic Pathology (Surgical and Autopsy)

The anatomic pathology rotation at Abbott-Northwestern Hospital, Minneapolis, is designed to instruct physicians in training in anatomic pathology in a high-volume community hospital setting. The rotation encompasses both surgical pathology and autopsy pathology. As each specimen is evaluated, physicians in training are instructed in the gross evaluation, microscopic evaluation, and ancillary studies of anatomic pathology. By providing residents with increasing responsibilities/duties with higher levels of training, the teaching faculty hope to instill the skills and tools necessary for developing a life-long structure for continued professional development.

- **Institutional Site Director**
  Dr. Saied Movahedi Lankarani, MD

- **Affiliated Teaching Faculty Members**
  [http://www.pathology.umn.edu/residency-fellowships/faculty-leadership](http://www.pathology.umn.edu/residency-fellowships/faculty-leadership)

- **Lead Technical and Support Staff**
  Pathology Office: (612) 863-4670
  Histology: (612) 863-4676
  Cytology: (612) 863-4668
  Admitting: (612) 863-4228

- **Training Site:**
  Abbott Northwestern Hospital, Minneapolis

- **Duration of Rotation:**
  3 months (6 weeks surgical pathology and 6 weeks autopsy pathology). 2 rotations periods required.

- **Post Graduate Level of Residents Involved**
  PGY levels 2-5

**Supervisory Guidelines for Patient Care and Specimen Handling**

**Surgical Pathology:** Physicians in training are to discuss each specimen with the supervising faculty member or pathologist assistant prior to its dissection. This discussion includes documentation of relevant patient care and prognostic staging information, the overall approach to the specimen and procurement of tissue in special fixatives or frozen if necessary. The faculty members and pathologist assistant supervise the gross room operation. The
majority of in-house cases in the gross room are handled by the resident. With the assistance of the supervising faculty, residents are required to review the microscopic findings of each specimen they grossed. Under the guidance of the teaching faculty, residents are responsible for deciding what additional ancillary studies maybe necessary to complete their cases.

**Autopsy Pathology:** The responsible attending pathologist must be notified prior to initiation of an autopsy. When notifying the attending pathologist, the resident should have the following prepared and verified:

1. A brief clinical history with specific elucidation of the events leading up to the patient's death.
2. The specific questions of the clinical attending physician to be answered by the autopsy.
3. Any specific radiographic or other imaging abnormalities that could be further elucidated by the autopsy.
4. The need for any special examinations beyond the "usual" complete autopsy (e.g., cultures, spinal cord examination, muscle biopsies for electron microscopy, examination of the extremities, retention of organs, photographs, etc.).
5. Any unusual circumstances that might require reporting to the Medical Examiner (e.g., therapeutic misadventure) or give rise to litigation (e.g., asbestos exposure).
6. An unusual infectious hazards (remember to use universal precautions in all cases), such as CJD, tuberculosis, HIV and others.

**Overview of Daily Duties and Responsibilities**

Residents alternate two weeks on the surgical pathology service with two weeks on the autopsy service.

**Surgical Pathology**

Residents are expected to arrive and be ready to begin their duties by 7:30 AM.

Based on their level of training, residents are provided increasing autonomy under close faculty supervision. During the rotation, a resident is responsible for grossing all specimens that come into the laboratory on their designated day. This includes the dictation of gross specimen features and the appropriate sampling of the specimen. The resident also participates in any special procedures performed, such as gross photography, sampling of tissue for electron microscopy, cell surface markers, cytogenetics, or tissue banking. Under faculty supervision on the subsequent day, the resident reviews those cases that they grossed on the prior day; the resident reviews the slides and reaches a specific diagnosis or differential diagnosis, either alone or with a faculty member depending on their level of training. The residents are responsible for dictating the original drafts of their interpretive surgical pathology reports. During the rotation, the resident is responsible for presenting a didactic lecture on a surgical pathology topic to the teaching faculty, technologists, and related health-care professionals.
While the surgical pathology fellows provide residents with answers to questions and help with locating references, the fellowship rotation is essentially distinct from the resident's rotation activities.

Resident feedback from the teaching faculty is provided directly during sign-outs and on an ad-hoc basis, when requested by a resident or when a faculty member considers it appropriate.

Additional Information:

- **Gross Room**
  1. Before dissecting, review all large specimens with Steve Rath or a staff member.
    a) Specifically follow the Abbott Northwestern Hospital Protocol for the gross examination/sectioning of prostatectomy specimens.
    b) All mastectomy and lumpectomy specimens must be reviewed by Steve Rath or a staff member, after the resident has dissected the specimen and taken sections.
    c) All cervical cones should be discussed with Steve Rath or a staff pathologist prior to cutting.
    d) Do not cut in temporal lobectomy specimens until you have discussed the case with a staff pathologist. These specimens must be fixed for at least 48 hours and the medical record reviewed for appropriate clinical and radiographic information before sectioning.
  2. Avoid submitting thick tissue sections for processing.
  3. Daily review the operating room schedule for potential brain biopsies. If a brain biopsy is scheduled, review chart in the preoperative area prior to surgery. Get the radiographic differential and findings and have them available before the frozen arrives.
  4. Thoroughly clean the cutting area and utensils between every case.
  5. All histology cassettes must be made by a technologist.
  6. Residents must not leave at end of day until all specimens from the 4:45 p.m. pick-up are grossed and submitted.
  7. Any specimen held overnight must have the approval of Steve Rath or a staff pathologist.

- **Microscopic Pathology**
  1. Special stain request cut-off times.
    a) 11:00 a.m. - cut-off time for histochemical stains. (x4676)
    b) Noon - cut-off time for immunohistochemical stains. (x4944)
    c) 2:00 p.m. cut-off time for deeper level requests. (x4676)
    d) Always discuss appropriateness of special stains with staff before ordering.
1. Always remember to request ER/PR on breast cancers!
2. Cut-off time for microscopic dictations - 4:00 p.m. All dictations after 4:00 p.m. that need to be transcribed the same day must be given directly to the secretarial staff.
3. Remember to keep dictation tapes under 5 minutes each when possible.
4. Remember to place liver biopsy slides from Dr. Coleman Smith and Dr. Robert Ganz in the appropriate slots in reading room for their review.
5. Appropriately T and M codes all cases.
6. Record the billing codes for each surgical case on the preliminary gross dictation report.
7. Review all of your corrected surgical reports at end of each day.
8. On post call Mondays, residents may dictate microscopic findings until noon and begin gross room / frozen duties at 1:00 p.m.

- **Breast Biopsies**
  1. In addition to measuring, always ink and weigh all breast biopsy specimens.
  2. Try to decline frozen section requests from the operating room whenever possible.
  3. Cut tissue sections for processing as thin as possible.
  4. All lumpectomy specimens should be inked according to the standard protocol outlined in the gross room. Discuss inking with Steve Rath or the staff pathologist.
  5. If a mammogram accompanies the specimen, state this in the gross dictation and describe the lesion identified in the films (i.e. focal area of calcifications vs. focal area of increased density).
  6. Breast biopsy reports must be faxed to the submitting doctors' offices by noon. Therefore, breast biopsy microscopic dictation tapes must be given directly to the secretarial staff. When the dictation comes back to you, immediately review, initial, and give it to the staff pathologist.

**Autopsy Pathology**

When an autopsy is requested on an Abbott Northwestern Hospital inpatient, the pathology office will obtain the patient's medical record, which will include the autopsy permit. The resident's first responsibility is to check for a valid autopsy permit. This should be signed by or have acknowledgement of telephone permission by the legal next-of-kin. The legal next-of-kin (in order of "declining priority") is the spouse, adult children, parent, sibling, etc. The resident should check the next-of-kin on the autopsy permit against the face sheet of the medical record to establish that the signatory is indeed the legal next-of-kin (e.g., permit signed by adult child when the spouse is still living = invalid permit). If there is any question concerning the validity of the autopsy permit, review the issue with the responsible attending pathologist. If the permit is questionable, it will need to be resolved with the risk management department prior to performance of the autopsy.

After review of the medical record, the resident must discuss the case with the attending clinician. The resident must also contact and invite the patient's house staff/attending
physicians to attend the autopsy. After reviewing the case with the responsible pathologist, the resident should commence performance of the autopsy. Remember to re-check autopsy permit for any restrictions prior to commencement of the autopsy. Universal precautions are required for all autopsies, including goggles to protect against mucous membrane splashes, mask to protect against aerosols and mucous membrane splashes, and double gloves. Kevlar and "chain-mail" glove inserts are available if desired. For known high-risk cases (e.g., HIV, hepatitis B or C), pre-mortem arterial embalming is recommended. In such cases or in cases of suspected military TB, considerations should be given to limit the autopsy to avoid procedures that could generate significant aerosols (e.g., cranial power bone saw). Use care to avoid cutting yourself or the autopsy assistant. If any exposure occurs during performance of the autopsy, notify the attending pathologist and report to Occupational Health for appropriate treatment. After completion of the autopsy and review by the staff pathologist, the attending clinician must be notified of the preliminary autopsy findings. Autopsy tissue blocks must be submitted within 1-2 working days to the histology laboratory. Depending on the case, the resident is expected to cut the brain fresh or after fixation and review the neuropathology with the staff and/or neuropathologist. Notify the staff pathologist when you receive the slides and set up a time to sign-out autopsy (Do not wait for staff to come to you). In order to consider an autopsy educationally effective, it needs to be completed within 30 days of the patient’s death. Therefore, trainees can only count those autopsies that are completed within this time frame toward their graduation requirement.

Residents are expected to be fully involved in all aspects of the post-mortem examination, including but not limited to review of the medical record, summation of the circumstances of death, external examination of the body, evisceration, dissection of the organs, preparation of the written autopsy report, preparation of the preliminary anatomic diagnosis, review of microscopic findings, review of all ancillary testing, and determination of the cause and manner of death. The above level of involvement is expected for both individual and shared autopsies.

**Goals and Objectives for Surgical Pathology**

Residents should review this section at the beginning of each rotation; halfway into each rotation, and at the end of each rotation. Problems in accomplishing any specific objectives should be discussed with Dr. Horwitz.

These surgical pathology skills are to be mastered during the first of the two anatomic pathology rotations:

- Familiar with the procedures for handling infectious specimens including HIV, hepatitis, tuberculosis, and others.
- Recognize normal gross anatomical landmarks.
- Thoroughly familiar with the sampling of lesions and surgical margins in the gross room, including inking/labeling and adequacy of sampling.
• Ability to handle biopsy and resection specimens of low and moderate complexity, with a
degree of difficulty equal to or comparable to resections of the breast, colon, urinary
bladder, prostate, larynx, lung, heart, and kidney.
• Provide an accurate and complete gross description.
• Provide an adequate differential diagnosis based on gross examination.
• Familiar with photographic techniques for gross room specimens.
• Familiar with different fixatives, their use, and indications: Formalin, Zenker, AZF,
Glutaraldehyde, and Bouins.
• Ability to interpret the majority of frozen sections in which the answer is either positive or
negative, such as surgical margins for tumors, presence of metastases, or presence of
ganglion cells.
• Ability to communicate effectively with the surgeon to obtain and transmit pertinent
information during frozen sections.
• Communicate adequately with the laboratory personnel to request specific studies on a
given case.
• Recognize normal histological structures.
• Provide an adequate morphologic description of histologic slides.
• Provide a precise diagnosis on common cases.
• Thoroughly familiar with special histochemical stains, their indications and interpretation
for elastic fibers, myelin, axons, amyloid (congo red, crystal violet, and victoria blue), copper
binding protein (Shikata'sorcein), PAS, and mucicarmine; Familiar with the use of digestive
enzymes, such as hyaluronidase, diastase...
• For common neoplastic lesions, determine using microscopic criteria, the benign versus
malignant nature of a tumor.
• In neoplastic lesions, determine its general category of origin (e.g. epithelial, mesenchymal,
lymphoid, etc.).
• Provide a reasonable differential diagnosis for neoplastic lesions.
• Organize surgical pathology reports to include all relevant diagnostic and prognostic
information.
• Prioritize bottom line diagnoses in terms of their clinical relevance.
• Learn and understand CPT coding of specimens and special stains.
• Know when a case can be signed out with the material available or if additional work-up is
necessary, including additional sampling, deeper levels, electron microscopy, histochemical
stains, cell surface markers, immunofluorescence, radiologic, clinical, or laboratory
correlation.
• Thoroughly familiar with immunohistochemical panels for common diagnostic problems
(e.g. small blue cell tumors, carcinoma versus mesothelioma, carcinoma versus sarcoma,
differential diagnosis of spindle cell tumors, primary site of a metastatic carcinoma,
differential diagnosis of melanoma, immunostains for infectious organisms, lymphoma
panel).
• Recognize specific bacterial infections, including Helicobacter pylori, pseudomembranous
colitis and others.
• Recognize common viral cytopathic effects, including herpes, CMV, RSV and others.
• Recognize fungal organisms, including Aspergillus, Candida, Mucor, Histoplasma, Blastomyces, Cryptococcus and others.
• Thoroughly familiar with histochemical stains for infectious organisms (e.g. Gram, Fite, Ziehl Neelsen, Gomori methenamine silver, periodic acid-Schiff), including indications for staining and the morphologic appearance of organism.
• Know how to use micrometer (e.g. Breslow's thickness in melanomas, distance to margins, etc.).
• Be able to abstract relevant information from an article in the literature.

In addition to the above, the following surgical pathology skills should be acquired by the end of the second rotation:

• Under staff supervision, be capable of handling all gross dissections, including difficult cases, in a semi-independent fashion.
• Be able to interpret the majority of frozen sections in which the answer requires an extended differential diagnosis.
• Be able to recognize the limits of your abilities and know when to consult other colleagues for help.
• Be capable of establishing a final diagnosis for the vast majority of simple and complex cases.
• Know when a case can be signed out with the material available or when additional work-up is necessary; including additional sampling, deeper levels, electron microscopy, histochemical stains, cell surface markers, immunofluorescence, radiologic, clinical, or laboratory correlation.
• Thoroughly familiar with the standardization of surgical pathology reports, including points in which there is uniform agreement and controversial aspects.
• Be able to critically analyze information from an article in context with the other available literature.
• Provide prognostic information on the biologic behavior of common lesions.
• Understand techniques (material, methods, indications) for special studies, including cell surface markers (lymphoma work up), cytogenetics, steroid receptors, gene rearrangements, and frozen tissue banking.
• Thoroughly familiar with immunostains for prognostic markers (e.g. p53, BerH2, PCNA, steroid receptors, etc.).

Goals and Objectives for Autopsy Pathology

1. Ability to conduct a complete autopsy examination regardless of age or sex, including removal of the brain and spinal cord.
2. Development of integrative thinking and writing such that preliminary and final autopsy reports reflect an understanding of the relationship between organ pathology structure/function and the patient's symptoms.
3. Ability to individualize and innovate the performance of an autopsy and the preparation of tissues and reports derived from an autopsy examination.
4. Master the technique of light microscopy insofar as examination of tissue sections, selection of appropriate "special" stains.
5. Understand the distinction between autopsy tissues and surgical tissues.
6. Recognition of tissue abnormalities related to aging.
7. Formally and informally communicate the significant aspects of autopsy cases.

**Resident Opportunities to Function as Consultant to Other Physicians**

During the rotation the residents will be exposed to laboratory consultation/correlation studies. These will include, but are not limited to, the following:

1. Correlation of fine needle aspiration studies with subsequent surgical pathology specimens.
2. Correlation of cervical PAP smear findings with cervical biopsies.
3. Correlation of ancillary studies with histology in the work-up of lymphomas and hematologic disorders.
4. Correlation of liver function tests with liver biopsies
5. Correlation of X-rays with bone tumor biopsies.

**On Call Duties**

The residents will be on at-home/pager call every other weekend from 7:00 AM - 2:00 PM for autopsies. Check with Admitting at 863-4228 throughout the on-call days to find out if there are any autopsies. On assigned call weekends, residents are expected to participate in the Saturday grossing of specimens and sign-out of biopsies. The residents are not on-call during the week days.

During this rotation the residents will on average have one out of every seven days free of hospital duties. During their on-call activities, residents will be supervised by a member of the Abbott Northwestern Hospital teaching faculty, who will be available at all times, either via their office phone, pager, or home phone. On-call activities are reviewed with the residents on an on-going basis, as calls are received. A faculty member is always present when a final diagnosis is established and at any time before, as necessary.

**Communication with On-duty Faculty**

Teaching faculty members on service are physically present during standard operating hours (7:30 AM - 5:00PM); specific faculty members when not physically present in the laboratory are available by phone or pager. At all times, a supervising faculty member is on call for evening and week-end questions. No diagnosis is communicated to clinicians before a faculty member has evaluated the case.

**Structured Education and Management of the Surgical Pathology Laboratory**
During this rotation, the residents will attend scheduled quality assurance, laboratory safety, and other appropriate meetings as they relate to laboratory management. As opportunity provides, residents will be allowed to participate in CAP laboratory accreditation, including self-inspections and inspections of other institutions.

**Required Conference/Seminars**

- **Tuesdays** - Hennepin County Medical Center/Abbott Northwestern Hospital Unknown Conference, 7:30-8:30 a.m., weekly. This conference alternates hospital sites each week. Weekly challenge of 5 current (difficult or classic) cases from HCMC and 5 cases from Abbott-NW Hospital for review and diagnosis by the residents. This conference provides a weekly forum for trainee and faculty discussion of difficult and unusual cases. Each resident gives a diagnosis in round robin fashion with questioning and discussion by moderating faculty (Bradley Linzie MD and John Jones MD) from each institution.
- **Wednesday** - University of Minnesota Laboratory Medicine and Pathology Grand Rounds, 8:00-9:00 a.m., weekly. Conference is held on the University of Minnesota Medical School Campus.
- **Fridays** - Rosai/Sinard Conference, 7:15-8:00 a.m., weekly, residents present a variety of real cases on a theme related to a recent or up-coming the faculty Resident's Conference. Conference is held on the University of Minnesota Medical School Campus. This conference provides a regular avenue for trainee peer teaching with feedback given by the Chief Resident's Subcommittee.
- **Fridays** - Resident's Conference, 8:00-9:00 a.m., weekly, residents attend conferences on a variety of scheduled pathology topics. Conference is held on the University of Minnesota Medical School Campus.

**Optional Conferences**

- **Mondays** - Breast Clinicopathologic Conference, weekly, residents attend this conference which correlates clinical, radiographic, and pathologic findings in light of treatment options.
- **Wednesday** - 7:00-8:00 a.m. Fairview-University Medical Center/Veterans' Affairs Medical Center Unknown Conference, weekly. Conference is held in the Division of Surgical Pathology at Fairview-University Medical Center. Residents are responsible for reviewing the cases prior to the conference. Slides are put out for review one week in advance. This conference provides a weekly forum for trainee and faculty discussion of difficult and unusual cases.
- **Thursdays** - City Wide Surgical Pathology Conference, 8:00-9:00 a.m., weekly, pathologists from the city bring interesting and difficult cases to share and discuss. This conference provides a weekly forum for trainee and faculty discussion of difficult and unusual cases.
- **Cardiac Pathology Conference, Dr. Jones, monthly, residents attend this conference which discussed cardiac abnormalities and transplantation issues.**

**Scholarly Activities and Research During Rotation**
Residents are provided with continuous access to literature searching programs. The expectation is that residents will utilize the medical literature to find up-to-date information on their cases. It is further expected that residents will utilize the medical literature to help provide our colleagues with up-to-date knowledge related to the cases they complete. During sign-out of cases, the residents and teaching faculty discuss each case, both from a histologic perspective and a scholarly perspective. In discussing the latter, the resident and faculty discuss both normal and abnormal physiology and the mechanisms potentially responsible for creating the morphologic findings observed. It is hoped that these discussions will foster an interest in research and the development of new knowledge.

**Basis and Method of Resident Evaluation**

The residents are provided with continuous feedback on their performance during their rotation. In general, only deficiencies are noted in writing during the rotation. Residents are evaluated on their demonstrated ability to provide informative consultation to the clinical service teams, their medical knowledge, their application of this knowledge to efficient/quality patient care, their diagnostic, technical and observational skills both in the gross room and at the microscope, and their interpersonal skills, professional attitudes, reliability, and ethics with members of the teaching faculty, peers, laboratory staff, and clinicians. They are also evaluated on their initiative in completing and fostering quality patient care, their use of the medical literature and other resources, as it relates to their assigned cases. Their timely completion of assigned interpretive reports is another component of the evaluation. Residents on probation will receive a written mid-rotation evaluation.

**Educational Resources Available**

Residents are provided with access to multiple general and specialty surgical pathology textbooks including:

- Sternberg, et al. *Diagnostic Surgical Pathology*
- Silverberg, et al. *Principles and Practice of Surgical Pathology and Cytopathology*
- Rosai, *Ackerman’s Surgical Pathology*
- Kurman, *Blaustein’s Pathology of the Female Genital Tract*
- Enzinger, *Soft Tissue Tumors*
- AFIP Tumor Fascicles
- Tavassoli, *Pathology of the Breast*

In addition to the on-site intradepartmental pathology library and private reference book collections of the teaching faculty, residents have access to the University of Minnesota Medical School Library (Diehl Hall) which is one the University of Minnesota campus.

**Computer Information Systems for Resident Education and Service Duties**
Residents have continuous access to the laboratory information systems, which relate to patient care on the Abbott Northwestern Hospital Campus. The residents also have access to on-line literature searching.